DESIGN & DIGITAL

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CNPq

OLHARES

DESIGN WASTE & DIGNITY

Edital Universal: 14/2011
Processo número: 475744/2011-0
Projeto: Design de Produto, Sustentabilidade e a Política Nacional de Resíduos Sólidos
Área do Conhecimento: Desenho Industrial
COCTC - Coordenação do Programa de Capacitação Tecnológica e Competitividade
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Printed in Brazil.

Design, Waste & Dignity / Maria Cecilia Loschiavo dos Santos, coordination; Maria Cecilia Loschiavo dos Santos, Stuart Walker, Sylmara Lopes Francelino Gonçalves Dias, collaboration; [translation Hedy Hofmann].
São Paulo: Editora Olhares, 2014.

Vários autores.
ISBN 978-85-62114-35-9

1. Catadores de recicláveis 2. Design 3. Reciclagem (Resíduos etc.) 4. Resíduos sólidos 5. Sustentabilidade I. Santos, Maria Cecilia Loschiavo dos. II. Walker, Stuart. III. Dias, Sylmara Lopes Francelino Gonçalves.

14-06079 CDD-745.4

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SUMMARY

FOREWORD

The long path that can bring us out of the current situation of (un)sustainability, presents us with challenging problems that are directly connected to the infrastructure and metabolism of contemporary cities.

What are the paths that could further this transition? Or are we inexorably on the road to the permanent (un)sustainability that threatens the future and points toward the "un-future".

This is the context of the complex problems of Urban Solid Wastes.

Garbage is an element that is present everywhere in the history of humankind.

In the 19th century, in Paris, writers and artists were fascinated by the chiffoniers – the ragpickers. Charles Baudelaire considered the chiffonier a record-keeper who selected what the big city discarded. Already in the 20th century also Brazilian literature and play-writing documented the presence of the catadores, as in the poem "O Bicho" (The Animal) by Manuel Bandeira (1947) or the play "Homens de Papel" (Paper Men) by Plínio Marcos (1967).

The classical book The Waste Makers *(Packard, 1960) already warned us about the consequences of hedonist consumption and talked about the "Age of Waste". In an apocalyptic view, this author foresaw the city of the future as the city of waste. Indeed, ever since the Industrial Revolution, the interactive*

patterns between human beings and the environment have been guided, as a priority, by the greed for material gains to the detriment of preserving nature.

The appetite of the contemporary world for consumption has led to a significant growth in the search for matter and energy, and also the vertiginous production of discarded materials on every scale: individual, local, national and global. This discarded material has become a basic element of the repertoires of subsistence of a significant part of excluded populations – homeless people and recyclable pickers.

In Brazil, reusing materials and products is a current practice in several spheres, be it in the production of informal housing, for instance the production of huts in favelas,or in the design of vernacular objects, especially in the Northeast, and in the last thirty years it has grown through the informal economy of the collectors of recyclable materials.

This is a type of economy that grew using the voids of sectors that had not been explored by capitalism. Thus the catadores established a strong economic activity with a strong environmental bias, organized in cooperative or even as independent catadores, promoting social inclusion, generating work and income, and also rendering environmental services to Brazilian cities.

The first cooperatives appeared in the 1980s and today the National Movement of Recyclable Collectors estimates that there are more than a million catadores at work throughout Brazil. In 2010 law 12 305/10 was enacted, that instituted the National Policy of Solid Wastes containing important tools for waste management in our country.

The present publication, which is the final report of the research project **Product Design, Sustainability and National Policy of Solid Wastes**, *CNPq – Edital Universal processo 475744/2011-0, aims to think and re-think the paths of waste transformation, its relations with product design, impact on society and morality/dignity aspects of the activity of recyclable collectors.*

This book grew from but does not duplicate my professorship (livre docência) dissertation Cidades de Plástico e de Papelão: Aspectos do Design no Habitat Informal da População de Rua em São Paulo, Los Angeles e Tóquio (Cities of Plastic and Paper: The Informal Habitat of the Homeless in São Paulo, Los Angeles and Tokyo) *(2003) where I sought to understand the survival strategies and sociospatial dynamics and materials of the homeless population in the three cities researched.*

The research project involved team work and an intense discussion among the different participating fields of knowedge, and also holding seminars and public workshops in Brazil and abroad, with the participation of the authors and the overall coordinator of the study.

Relations between design, sustainability and the National Policy of Solid Wastes configure the beginning of a new theme, consequently enriching the perspective of design, favoring a broad approach to several topics descriptively, always marking the Brazilian attitude and contribution towards the challenges presented by that topic.

As will be seen during the course of the chapters, it was attempted to promote the interpenetration of reflection, theory, profssional practice of design, legal practice, the catadores' practice, the artistic practice corresponding to the magnitude and fluidity of the topic discussed.

Thus the book **Design, Waste & Dignity** *was organized in five parts.*

The first part "Rethinking Design and Waste"*, grouped the reflections of teachers of design regarding topics that are at the front line of knowledge between design, art and wastes, and also their contradictions and connections with the context of current urban poverty.*

The second part "Contributing through Design"*, brings several possibilities for the field of design and people who formulate public policies to be able to understand how and where the practical contributions of design lie.*

In the third part "Vivifying Policy" *are the contributions and reflections on the National Policy of Solid Wastes, both as regards its construction and implementation, and legal aspects.*

The fourth part, "Sharing Practices" *presents cases involving the topic of wastes in Brazil and experiences in the European Community.*

The fifth part **"Learning from the Catadores"***, has texts on the catadores' work with waste, since in the Brazilian case they are the actors who first identified and produced value from what we considered garbage.*

The book ends with "Propositional Objects: Designing with Waste".

We will feel gratified at the effort invested if our work can lead to a new look at the problem of waste.

ACKNOWLEDGMENT

Our sincere thanks to the National Development Council Scientific and Technological [CNPq], the Faculty of Architecture and Urbanism University of Sao Paulo [FAU], the Autonomous Cooperative of Recyclers Paper, Cardboard, Scrap and Recyclable Materials [COOPAMARE.] and all professionals and institutions involved in this project.

RETHINKING DESIGN AND WASTE

WASTE LAND: SUSTAINABILITY AND DESIGNING WITH DIGNITY

STUART WALKER

DESIGN, SUSTAINABILITY AND WASTE IN CONTEXT

Design is a discipline that brings together a diverse range of factors and integrates them into specific outcomes or *design solutions* by way of processes and practices that combine intellectual knowledge with human imagination and creativity. It is a discipline that is capable of tackling complex issues in situations where the question cannot be clearly or narrowly defined, where information is incomplete, and where a variety of outcomes are possible; this is the nature of so-called 'wicked problems' and the designer, trained in combining analytical and synthetic approaches, is well-positioned to address such problems.

The contemporary challenge of sustainability is one such wicked problem. It encompasses environmental, social and economic considerations as well as individual purpose and profound notions of personal meaning that go to the heart of what it is to be a human being. Clearly, our current ways of living are unsustainable – not only have Modern interpretations of the good life proved to be environmentally devastating, socially divisive, and economically inequitable, they have also nurtured widespread discontentment and have helped create a sense of meaninglessness in contemporary consumer-based societies (WILKINSON AND PICKETT, 2009, P. 226; SCHWARTZ, 2004, P. 109-193; TAYLOR, 2007, P. 715-717).

An important characteristic of this condition is the excessive production of waste and pollution — a characteristic that is associated not only with environmental damage but also with an ungracious attitude to nature's provision and to the products of the human imagination that are created from this provision. To appreciate the causes of such severe waste problems, especially within major urban conurbations like Sao Paulo, we have to examine the essential structure of our predominant economic system. This is a system that is inextricably tied to consumerism and over-production and, hence, it is this system that is the fundamental cause of the waste and pollution problem. By taking a critical look at this overarching system we can, if we have a common will, work towards positive change — change that is more environmentally responsible, more socially just and inclusive, and which, potentially, can be more healthy and more fulfilling for everyone, whether rich or poor (WILKINSON AND PICKETT, 2009).

MODERNITY AND THE ROOTS OF UN-SUSTAINABILITY

The rise of industrialization, urbanization and, subsequently, mass-production, and the problems associated with over-production, product obsolescence and excessive waste can be traced to the developments of Modernity. The term Modernity refers to a period in which, over the course of several centuries, societies set aside traditional forms of knowledge, and instead adopted a philosophy — or ideology — of materialism. Such societies, which today have become ubiquitous, are characterized by:

- dependence on industrial production,
- an aspiration of continual economic growth,
- so-called 'progress', which in this context is a rather limited notion that refers especially to advances in science and technology, as well as to human benefits that are of a predominantly material kind.

Modernity can be traced back as far as the 1500s and to early developments in science, the scientific method, and the privileging of evidence-based knowledge, but it is more commonly associated with the rapid technological and social changes that occurred during and after the Industrial Revolution, which began around the 1750s. With these changes, more holistic understandings, including our understandings of the world around us, became steadily eroded. Knowledge became more specialized and as it did so it was compartmentalized

into distinct disciplines – represented by those subjects we now consider to be sub-categories within the sciences: chemistry, physics, biology etc.; the arts: fine art, music, theatre, design etc.; and the humanities: social sciences, languages, philosophy, history etc.

Specialization in the physical sciences enabled rapid knowledge development and this knowledge was rooted in empirical evidence based on the observation and analysis of the natural world and physical phenomena. The application of this scientific knowledge, for human benefit led to innovation and the production of technologies. However, unlike advancements in pure science, which can be largely values-free, the *application* of such knowledge through technological innovation is values-laden and ideological.

In the early part of the Industrial Revolution, technological applications were aimed mainly at the development of industry itself, in the form of large machines such as the waterwheel, the steam engine, and factory equipment. At a later stage of development, technology applications became directed towards domestic life. Technologies were packaged into products and sold for profit. As a result, because of their relationship to wealth generation, certain types of knowledge, i.e. those provided by science that could spur technological innovation, became prioritized in modern society. In the twentieth century, technological products became mass-produced, and this type of production grew enormously during the boom years that followed WWII. Furthermore, mass-production by companies owned by shareholders, who expected constantly increasing share prices and dividends, helps foster an economic system that seeks continual economic growth and increases in profits. Consequently, a system developed that requires and forcefully encourages the continual and expanding consumption of mass-produced products, which is supported by a colossal advertising industry.

DESIGN, CONSUMER CULTURE AND WASTE

It is this system that saw the birth of the product designer, who was employed to style the mass-produced products and to differentiate them from those of competitors. Product design quickly became an arm of advertising and a tool in the art of persuasion. The annual model change, regular style updates, brand image, and so-called consumer 'choice' all became important aspects of industrial design because such things helped drive sales and profits. In the late twentieth and early twenty-first centuries this system became

globalized. Trade barriers were swept aside and markets opened up so that corporations could produce as cheaply as possible, usually by externalizing the environmental and social costs of their endeavours and by avoiding tax (not least, through the distribution of operations among a variety of countries, so that a company was no longer located within a particular national border and tax regime). Profits were increased further by making products un-repairable or economically unattractive to repair; and technological and/or psychological obsolescence within as short a time as possible became commonplace.

It is this system that is the cause of our contemporary problems of waste production and waste management. It is extremely damaging both socially and environmentally. Profit-maximization by global corporations is associated with exploitative, low-wage labour practices, especially in those countries with developing economies, and wealth concentration rather than equitable distribution. In turn, this contributes to unconscionable social disparities and division.

Moreover, as profits and Gross Domestic Product [GDP] grow from increases in consumption, so does the need for materials extraction and energy use – despite energy efficiencies and decreased material intensities i.e. the amount of materials used in products (UNEP, 2009). This has resulted in the planet being seen largely in instrumental terms, as an unlimited supply of cheap 'resources' for manufacturing rather than as a precious living thing that sustains all life, including our own. It is inevitable that, by setting our sights on ever-rising profits, we become complicit in:

» eroding and eradicating natural places,
» disrupting ecosystems,
» reducing biodiversity,
» creating food shortages due to reduction in land use for crop farming (e.g. through mining operations, highway construction, and land designated for growing crops for bio-fuels),
» reducing the availability of clean water, and
» increasing climate changing emissions.

Predictably, this consumption-based economic system is accompanied by inordinate quantities of solid waste production in the form of obsolete goods and consumer waste, as well as industrial and packaging waste.

We have been slowly, many would argue far too slowly, extricating ourselves from Modernity and the thinking it represents since the middle of the twentieth century. The assumptions of Modernity appeared less tenable after the industrialized warfare and atrocities of the recent past – the industrial

scale death camps of the Nazis and the use of scientific advancements to create atom bombs that were dropped on civilian populations. The post-war years saw the adoption of the Universal Declaration of Human Rights by the UN General Assembly in 1948 (UNITED NATIONS, N.D.), the rise of civil rights, feminism, gay rights and the emergence of the environmental movement. These developments heralded a period we refer to as late- or post-Modernity. However, despite these emerging challenges to the ideology of Modernity, its ideas, values and practices are still firmly entrenched and continue to dominate our activities.

A different kind of economic system may be difficult to imagine and even more difficult to implement from our current vantage point. Nevertheless, it is all too clear that if we are to create a more sustainable way forward, then radical change will be needed — a point that is now even being recognized by the World Trade Organization (LAMY, 2013) and the World Bank (STEWART AND ELLIOT, 2013). Such change represents a systemic shift away from our current approaches that are so dependent on material consumption, towards one, for example, that is a no growth or very limited growth economy, as proposed by authors such as Daly (2008) and Jackson (2007). It will mean a system in which the true costs of producing products and packaging are included in the economic modelling and producers take responsibility for and ameliorate the waste, pollution and economic injustices they currently cause. Indeed, it will mean developing a system in which consumption and continual product disposal and replacement are seen as undesirable and to be avoided rather than encouraged.

Naturally, a systemic shift in our economic model implies a substantial change in the purpose and practice of design. The designer would have to give far less attention to styling and marketing objectives, and cease to comply with such cynical practices as technological and psychological obsolescence, which are aimed at creating dissatisfaction and fostering consumption. Furthermore, new design priorities need to go far beyond life cycle analysis, technological and energy efficiency, materials reduction and product longevity. However beneficial such practices may be, they do not go far enough in substantively rethinking the nature of our material culture such that it is more fully compliant with the principles and requirements of sustainability. Similarly, the triple bottom line of sustainability, as proposed by Elkington (1997) requires further development if it is to incorporate the potential for more substantial change in our thinking and our worldly activities. As I have discussed elsewhere (WALKER, 2011, P. 185-285) the triple bottom line deals with very large issues that are far removed from the ordinary person — i.e. society, environment and economy. Consequently, it lacks connection to the individual. It also places economic considerations on equal footing with environmental and social

responsibilities but, within the frame of Modernity, economic considerations invariably take precedence over the other two. Therefore, it becomes important, in our evolving considerations of the meaning and progress of sustainability, to include connection to the individual person, i.e. to inner values and spiritual wellbeing. This is perhaps especially relevant today, where inundation of information, advertising and multi-tasking via digital products promote an 'always on' culture that is frequently characterized by addiction-like behaviours around product use and that substantially reduces or even eliminates time given to self-reflection and contemplation. To address these considerations a quadruple bottom line has been proposed (WALKER, 2011, 190) that comprises:

» **PRACTICAL MEANING**: pursuit of knowledge, understanding nature and furnishing utilitarian needs while recognizing and substantially reducing or even eliminating their environmental impacts. Thus, practical meaning refers to providing for our basic needs in ways that are environmentally responsible and materially sustainable;

» **SOCIAL MEANING**: pursuit of justice, moral behaviour, relationship to others, responsibility to community and social equity. Thus, social meaning refers to providing for our needs as social beings. It raises issues about moral norms, ethical values, tolerance, empathy, and our essential needs as gregarious beings that live alongside and depend on other people;

» **PERSONAL MEANING**: pursuit of wisdom, inner growth and values, sense of purpose, core ethics and questions of conscience. Thus, personal meaning refers to our deepest notions of who we are as individuals – it includes spirituality, higher needs, questions of ultimate concern, and the perennial search for meaning in life;

» **ECONOMIC MEANS**: subordinate to the other three and regarded as a means to an end, not an end in itself. While the importance of economic considerations as a means is fully recognized, the pursuit of profits and economic growth as primary objectives for their own sake is challenged — not only because of the devastating effects such priorities have already wreaked on people and planet, but also because they run counter to all the major wisdom and spiritual teachings that have come down to us through the ages.

When practical, social and personal meanings are brought to the fore, and economic means is allotted secondary status as an 'enabler', then we create a meaningful space for radical innovation and systemic change (**FIGURE 1**).

Moreover, counter to much contemporary thinking among governments and businesses, these factors are not in competition, they must all be addressed

at the same time. Of course, within our current ways of thinking and in pursuing current priorities this is difficult. The challenge is to redirect our activities such that the fundamental goals and processes of doing business are sympathetically aligned with these four facets of sustainability.

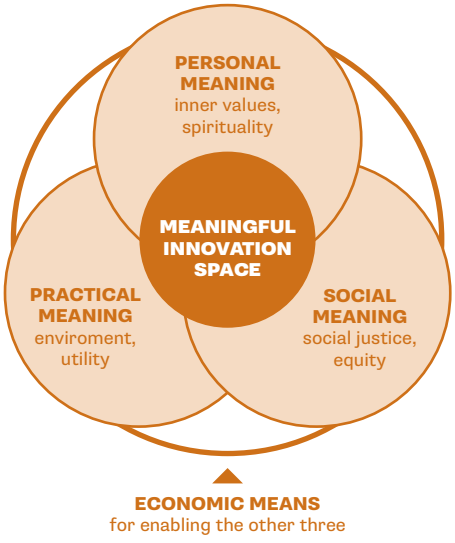

FIG. 1 The Quadruple Bottom Line of Sustainability and Meaningful Innovation.
Source: Developed from WALKER, 2011, P. 190.

RE-POSITIONING OUR NOTIONS OF INNOVATION

Currently, much innovation aimed at reducing environmental harm focuses on the *practical meaning* facet of the quadruple bottom line. Green technologies, eco-technologies, sustainable human-computer interactions [HCI], higher efficiencies and lower energy solutions. All these represent incremental improvements within the current system. They result in a host of new eco-products, which not only renders older models obsolete, but also encourages further consumption. These kinds of solutions represent an inadequate way forward, one that is incapable of advancing the kind of systemic change that is needed. They do, however, fit easily within current enterprise models and are readily embraced by businesses and governments because they continue to contribute to 'progress' and 'growth'. Yet, such approaches can be counter-

productive not only because they create an impression of positive action and hence complacency but also because they result in no significant overall improvement. In fact, due to increased consumption and rebound effects, often their impact is nil or even negative. Consequently, despite considerable efforts in many areas, climate changing emissions, consumption, environmental degradation and waste continue to rise.

A more holistic approach to innovation is required that embraces *practical meaning*, *social meaning*, and *personal meaning* within new forms of enterprise that also enable reasonable profits, which any company depends upon in order to stay in business and to be able to invest for the future. In this case:

» **PRACTICAL MEANING** includes local initiatives in terms of materials and making, forms of working and forms of production that are attuned to the particularities of place. This includes the availability of local or regional natural resources, and taking into consideration the local climate and geography. It also means taking into account the particularities and distinctiveness of the local human culture – traditions, customs and religious considerations as well as, and in conjunction with, everyday practical utilitarian needs. Through design, *practical meaning* can also include creative approaches that require minimal processing, transportation, and waste. These kinds of priorities suggest design and production approaches that are *situated* and *particular*, that are sympathetic to and contribute to locale and culture through adaptation, customization and aesthetic distinctiveness.

» **SOCIAL MEANING** is clearly interwoven with *practical meaning*. It means that our activities and enterprises take into consideration the provision of good quality, fulfilling local work capable of providing a living wage while also offering opportunities for development of knowledge, skills and advancement. Local jobs not only reduce commuting, thereby increasing time with family and friends, which can be beneficial to community building, but also reduce requirements for transportation, energy use and production of pollution. Locally situated enterprises for local markets also allow direct awareness of the effects of their activities on nature and on people. In turn, and being relatively small, this allows businesses to be responsive, adaptable and responsible; the priority being not the maximization of profits but the attainment of reasonable profits in ways that embrace a host of other priorities

and potential benefits. Cooperative models, such as those developed at Mondragon in Northern Spain are good examples of alternative, socially oriented production enterprises (MONDRAGON, 2013). These initiatives include production, transportation, schooling, university, training and development, all within a cooperative framework that moderates economic inequities and pursues the social good. In this way, enterprise and business become community oriented and a benefit to social development and social cohesion.

» **PERSONAL MEANING** is obviously supported by the kinds of initiatives and business models discussed above. Such local, community-oriented enterprises provide a sense of belonging and contribution that can reinforce ethical behaviours while also being spiritually enriching. In turn, they can start to nurture different kinds of priorities and values from the competitive, individualistic, divisive, and self-oriented but ultimately superficial and unfulfilling priorities and values continuously encouraged by consumer culture, corporate marketing techniques and pervasive advertising.

While all these facets of an holistic approach to innovation and enterprise are integrated and mutually supportive, they fall outside the mainstream of contemporary business models and political visions. They challenge our assumptions about 'product' and 'progress' and offer different kinds of creative concepts that are less concerned with technological innovation and more embracing of social innovation. They are also small scale, pluralistic, dispersed and disparate, and therefore more difficult to oversee and to 'control' — by either corporate or governmental institutions. The widespread adoption of such directions would represent systemic innovation and radical change — in fact, just the kind of innovation and change that sustainability demands. It is a direction that suggests very different priorities and values from those encouraged today. For example, it requires that we ask if the production of a new product is even warranted, rather than seeking reasons to produce something new. It asks us to consider the spiritual impacts of our productions, to consider issues such as sufficiency, our use of products and their potential effects on wellbeing. It asks us to consider the importance of providing useful and fulfilling human work, and its relation to human dignity, family cohesion, and community; which contrasts markedly from current models that seek to constantly eliminate jobs and adopt automated processes in order to maximize profits.

NEW DESIGN PRIORITIES

All these things represent a host of new design priorities and a different kind of design contribution. Hence, designers will need to move away corporate models in which they design products for mass-production and assembly in a variety of places distributed all over the world; products that are then packaged and dispersed worldwide via a one-way distribution-retail network. Instead, designers would work within local communities, co-developing products for local or regional use. Such situated design and production also allows retrieval for repair, upgrading and re-use of materials and parts, thereby further reducing the environmental impacts, energy use, resource requirements and production of waste.

With such approaches, our vision of the complexities, impacts and effects of our activities becomes more holistic. Hence, it begins to counter the divisions of knowledge into 'siloed' specialisms that occurred with the progress of Modernity. Instead, it starts to synthesize our different areas of knowledge via collaborative, cooperative approaches that are fully embedded in and cognisant of locale, and thereby are sensitive to the environmental and social benefits and detriments. In this way, *practical meaning*, with its focus on cognitive knowledge, science, and instrumental rationality, *social meaning*, with its focus on ethics, justice, and moral-practical rationality, and *personal meaning*, with its focus on spirituality, conscience and questions of purpose, become instilled in our expressions of material culture through the creative integration and aesthetic sensitivity offered by design. In turn, the discipline of design develops from being the rather undignified vassal of environmentally and socially unconscionable corporate expansionism and profit maximization, and instead matures into a socially beneficial, environmentally responsible catalyst for true innovation and change. The products of design move away from the anonymous 'one-size-fits-all' outputs of twentieth century mass-production towards far more sophisticated, holistic, complex forms of expression that:

- Synthesize local materials, skills and cultural preferences with mass-produced parts,
- Embrace not only utility but also symbolism and deeper notions of human meaning,
- Are not only functional but rich expressions of human culture and purpose, and
- Are both long lasting and continuously adaptable to changing needs and advancing ideas and technologies.

These are the directions in which contemporary understandings of sustainability point. They are deeply humanistic and environmental. They ask us to rise to the challenge of living according to the best part of us, to counter the deeply destructive self-indulgence promoted by current forms of corporate capitalism and to develop new, socially just, environmentally sensitive and personally meaningful directions based in sufficiency, localization and community. Design has an important role to play in this endeavour. Designers are trained to be creative, to have the skills to give concrete expression to abstract, un-synthesized ideas in ways that are creative and compelling; today they also have to be responsible and as far as we are able, sustainable. Hence, design and the way it is conducted are fundamentally related to the nature of our material culture, its meaning, its technical and psychological longevity, its adaptability, reparability and the nature of its eventual demise. It is therefore fundamentally linked to the nature of local enterprise, the nature and quality of work and the production of waste. Consequently, within an holistic, synthetic understanding of *design for sustainability*, the designer has a critical and honourable role as a catalyst for productive change for the good.

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TIME AND (UN)SUSTAINABLE DESIGN

WILSON KINDLEIN JÚNIOR

In a fast world, based on the consumption of the greatest possible amount (excess), at the fastest possible speed, it is assumed that there cannot be sustainability, for the simple reason that there is no place for the essence: time (duration, stability, constancy, permanence, etc.). Sustainability depends on time. Quoting the words of José Miguel Wisnik, in the song *Time without Time*, in which the composer goes marvellously to the heart of the matter and writes *"see whether you can find a time to meet me without any problem for some time"*, it is easy to see that no human relationship can be sustained without maximizing the variable time. Love needs time, tenderness needs time, friendship needs time and sustainability needs time. Since we are compelled to live in a hurry (haste, hustle and bustle, running around, etc.), it is rare to dedicate a time without problems to something (attention, dedication,etc.), "or to someone (respect, friendship, love, tenderness, etc.). Thus we have seen the destructuring of the social network, since without time there is no attention, care, zeal, etc. Care needs time, prevention needs time, affection needs time, tenderness needs time, friendship needs time, compassion needs time. Developing this thought, with the support of Vitor Ramil, in the words of the song *The Illusion of Home*, we can say that *"[...] time is my place, time is my home, home is where I want to be [...]"*. If we wish to be sheltered, cozy, protected and welcomed, we need time, without time there are not paths;

there is only the beginning and the end, without an itinerary, without a course and without direction. Without time there is no home, and if there is no home (we should remember that we live on planet Earth) where are we going to be? There are no real changes, since to truly change it is necessary to stay, and to stay it is necessary to have time. Since we do not have permanence, we do not have constancy, and therefore we do not have conservation (without conservation, there is no planet, and without a planet there is no life). If there is no conservation, there is no sustainability. To have sustainability it is necessary to use the notion of future. Since the future is waiting, waiting is time and we have not had time, we are losing the notion of future, and if there is no future (instantaneous world, fast, rapid, brief, etc.), there is nothing to sustain, there is no reason to preserve, because we only preserve what will be, according to concept, used in the future. In this sense it can be asked; Is this how one loses social responsibility toward the environment (nature) and to other people (nature of human relationships)?

On the contrary of common sense, when we repeat ourselves throughout our life, work or history, we are not losing time, what we are doing is to increase our consistency. Here is the question: Why change (discard) everything at the same time and all the time? Where is the importance of experience, of repetition, of investigation and contemplation? One might expatiate that experimentation requires time. One must consider the time to maturing (maturing, waiting, etc.). In this field without time we are losing the power to experiment (we navigate everywhere, but do not dive). We lose depth. To reach these deeper levels it is essential to extend time. This extended time allows immersion and understanding. Understanding which is closely related to learning. Learning which is done by paying attention. It should be mentioned that to have attention, it is necessary to have time. It is impossible to try to sediment a content without using the item time, and there is the root of attention deficit, a fact that has concerned educators and psychologists. The high rates of children with attention deficit have been indiscriminateldy combated with the abusive use of medications, but the real problem is lack of time. Our children are overwhelmed with various and even concomitant activities. The remedy for this epidemic (attention deficit) is dedication, but dedication requires time (a child without time is a child without attention - here 'attention' must be interpreted according to both meanings; attention to the child, and the child's attention). Once again the fulcrum of the problem is lack of time. It is thus mandatory to retrieve the backwaters, the shelters, the lulls, the public spaces, the belonging. Time allows reflection, thinking, dematerialization, accumulation of energy, the look, the dream, patience and perseverance. These values are

essential so that society will not become even more ill. An illness that is generated by anxiety, and anxiety which generates depression and abandonment (disposal), Discarding that prepares all the conditions for drug addiction, and consequently going of the tracks. If there is no path, there is no trajectory. Without a trajectory, how can the story of each person be written? A man without history is a man without memory; without a memory he is forgotten, a discarded person and an abandoned person.

To make use of this path (our life, our story), it is necessary to pass every point on the banks following our course. Rivers teach us that their course (their paths) are usually sinuous. One should learn from the rivers that the most beautiful paths are not the shortest ones (straight line). The most beautiful paths are those that allow one to appreciate all deviations (curved lines), therefore those that take the longest.

One should also learn from materials: glass teaches us that if we are very hard, we will be very fragile; steel teaches us tenaciousness; wood teaches us that it is important to associate lightness and toughness. However, the greatest lesson it teaches us is when we observe its concentric rings that show how important repetition is (one talks a lot about innovation, but who says that it is essential to repeat?). Repeating is important, because repeating provides consistency. Is it always essential to design something that is contemporary, always ahead, always advanced, always expanded? Could we be losing our density, our robustness, our essence, our module, our segmentation, our portion, our composition, our differentiation, our passing, our transformation, our rhythm, our repetition and our consequent solidity and balance? If there is no balance we are unstable. Everything that is not stable becomes unstable; it canot be sustained and normally falls or topples over, becoming unsustainable.

Having presented this scenario, it is indispensable to question unbounded (unsustainable) consumption, beginning with its three basic pillars, as indicated by Giles Lipovetsky, in his book *"Paradoxical Happiness"*: programmed obsolescence (discarding), publicity (desires) and credit (facilities).

The purspose of programmed obsolescence is to diminish work life, ie., to weaken sustainability (intentionally provoking rejects, and purposely determining remnants). Several techniques are used for this improbity, including: rendering materials more fragile, weakening systems, rendering the product obsolete through technology or even through esthetics (tendencies). **FIGURE 1** shows a product in which, in the original part, the programmed falure technique of the sealing system is used, and in the replacement part, besides this method of programmed failures, there is still the project of a piece with a part that is thinner than the original one, and thus even weaker.

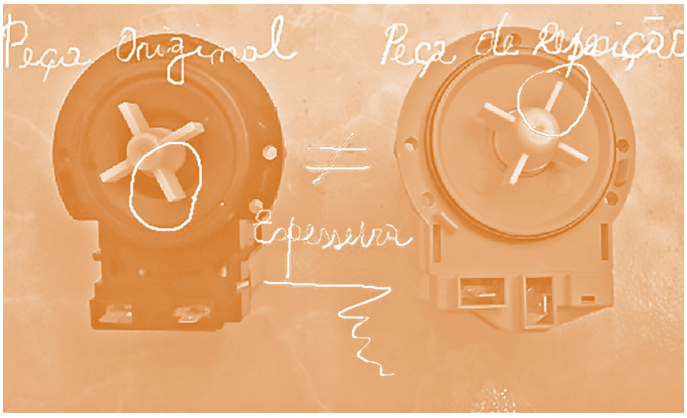

FIG. 1 Original part and replacement part showing programmed obsolescence. (Product Design for Programmed Failure). Source: Wilson Kindlein Júnior.

As to credit (the second basic pillar to stimulate consumption), it is easy to understand that a product acquired in this manner, is considered in the present (immediatism) as a good that would be possessed in the future (waiting). Currently, to make the wheel turn (faster and faster), saving (waiting) is discouraged, and credit (not waiting — in Portuguese *não espera = des espera = desespero*, not waiting, dyswaiting, despair) is encouraged. Thus, today we use goods that are not really ours (car bought with a loan, garments on credit, mortgage to purchase our home, etc.). In other words, we "rent" the sevice provided to us by these goods: transport, shelter, housing, etc. The problem is that when these services (rent) end, they are discarded (in nature) and these remains become a serious environmental and social problem (trash). This problem of trash already affects even distant sources, such as the mangroves.

The role of publicity should also be discussed as the third basic pillar of consumption. In this item we are bombed daily by marketing in the social networks, on the internet, on television, in newspapers, in magazines, in posters, in outdoor adds, etc.), with an incalculable number of what we might call "summons to consume". These ads invade the consumer emotionally, "Open up Happiness", "Moved by Passion", and also with selfishness "Because I deserve it". This individualism causes hedonism and a consequent lack of commitment to the social network. Ads with promises of filling the lack of happiness, love, tenderness, sex, etc. lead to thingification of the deepest feelings. In a society that lacks these feelings (precisely due to lack of time), this appeal functions at the most elementary levels of the human mind and alters the purchasing pro-

cess (consumption), even if subliminarly. The more society lacks feelings, the more it consumes. Therefore the system aims at generating destructured consumers. Therefore the systems aims at generating destructured lives, torn familiies, people without rules. In brief a torn (ill) society consumes more because it has more lacks and less support structure (if there is no support, there is no sustainability); and any occurrence that does not sustain itself (that has no support) is unsustainable.The sustainment of any structure are the ties, the interdependencies, the commitment and the connections. These items are not sustained ina society based on the logic of discarding and individuality.

FIG. 2 Finding trash in distant water sources, such as the mangroves of Lençóis Maranhenses (Maranhão /Brazil). Source: Wilson Kindlein Júnior.

We must foster attitudes that will include preserving friendships, protecting families, conserving love, defending the planet and sustaining life, but we must act calmly and quietly, within a feasible scale of consumption and human doing. These attitudes musisut use time (permanence, constance, stability, continuation, repetition, etc.) as the fuel for preservation. It is essential to find new, more sustainable ways of producing, but mainly to discover new ways of consuming sustainably. In this sense, it is important to educate consumers and provide the designer with instruments, since one of the requirements for sustainability is that the products be designed and manufactured to be easily assembled (DIA), but their design does not take into account disassembling them (DID), making them difficult to reuse, remanufacture and/or recycle. As in the case shown in **FIGURE 3**, where one can see welding at points on the fairing metal sheet, making it difficult to access the components to perform production maintenance.

Even products that are made of a single or of few materials (which would make them easier to reuse), and even if they are also identified with recycling symbols, arrive at the sorting centers (already appropriately separated by the population and transported appropriately by the government (selective collection), but are not financially viable (profit), to be recycled. **FIGURE 4** shows the case of many packagings that are rejected by the Sorting Center. These mate-rials are then discarded at the sorting center itself and return to the landfill and/or even to garbage dumps.

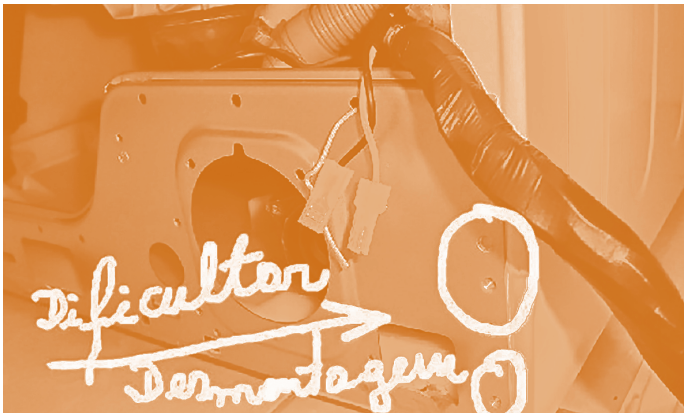

FIG. 3 Weldings at points on the fairing metal sheet, making it difficult to access the components to perform product maintenance. Source: Wilson Kindlein Júnior.

FIG. 4 Many packagings that are rejected by the Sorting Center (they go to garbage-discarding the disposables). Source: Wilson Kindlein Júnior.

There is a large volume of materials that are not used at the sorting centers. This particular aspect is not widely known to the public at large, to the government, nor to the designer, and also not by the materials engineers. It is known that the vast majority of domestic waste does not even reach the sorting centers and now we know that a larrge part of what arrives there goes unused. **FIGURE 5** shows a bucket of disposables (several loads are sent every week from each Sorting Center to landfills and/ior event o card (several buckets are sent a week, form each Sorting Center, to landfills and/; or even to garbage dumps).

FIG. 5 Buckets in which materials that do not add value for the Sorting Center are deposited. Source: Wilson Kindlein Júnior.

The current unbridled demands of consumers generate a pressure for "innovative" products in the industry, which is great source of industrial and urban garbage that nowadays can mostly not be used by the sorting centers, either because they are impossible to dissassemble, or because it is very difficult to identify correctly and separate the materials, systems and subsystems that compose a product. This process can only be reverted with ethics, education, social and environmental consciousness, and by knowing the technical/scientific fundamentals (appropriate identifcation and separation at recy cling, redevelopment and reuse of materials and products from the collection). There is also a need to teach and consequently reuse a project methodology adequate to recycling. In this sense, it is essential to guide the designer regarding the importance of the initial stage of the project so that, at the end of the work life of the product, the recyclable materials picker will have a better chance, through correct identification, of adding new materials that may be of value for sale and/or reuse in making new products. If this focus is maintained,

it is possible that the pickers have their work acknowledged and respected by society, thus helping include these families that work in materials recycling. But it can be easily perceived that in the current social situation, the system is not sustainable as a whole. We live in the throw-away society, be it of humans or of consumer products. **FIGURE 6** shows the canisters where the material that currently has no value for the Sorting Centers is discarded. This material follows the path of the red arrows into the trash.

FIG. 6 Discarded materials (that currently have no value for the Sorting Centers). Source: Wilson Kindlein Júnior.

In this logic of abandonment, everything and everyone is discarded. And, even worse, all of this occurs in a short time period. Acceleration and speed generate remnants, and these remnants are discarded instantaneously, rapidly and repeatedly. Often these remnants are from industrial product systems and subsystems which are intentionally designed to make it impossible to repair the parts, imposing on maintenance people, especially those working at the official vendors that they simply exchange the entire system (set), without any possibility of repairing the parts. This is the case of the control system shown in **FIGURE 7**. In this configuration, even if the defect is in a small component of the system, there is no way of disassembling the system to exchange only the defective component. To repair the problem, the maintenance people are obliged to exchange the entire set, either because they do not find the damaged component for sale, or because the factory obliges them to, or because they run into fixation systems that prevent disassembly, or even because they encounter the use of glues or resins that cover (encapsulate) all of the components, preventing access to the defective item.

Many of these systems, components and packagings are made from polymers. The degradation time of polymers is disproportional to their time of use. Here we can imagine a throw away fork for each slice of chocolate cake. Only a few minutes of use (time used to eat the cake) and dozens of years for it to degrade (time needed for the material to deteriorate after use); these remnants (macroplastics = pieces larger than 5.0 mm) are deposited in many inappropriate places without proper care. **FIGURE 8** shows the macroplastics found on Caburé beach in Lençóis Maranhenses (Maranhão/Brazil).

FIG. 7 Control system where it is impossible to exchange only the defective component; the entire set must be changed, thus the entire system (or set) becomes the component that needs to be changed. Source: Wilson Kindlein Júnior.

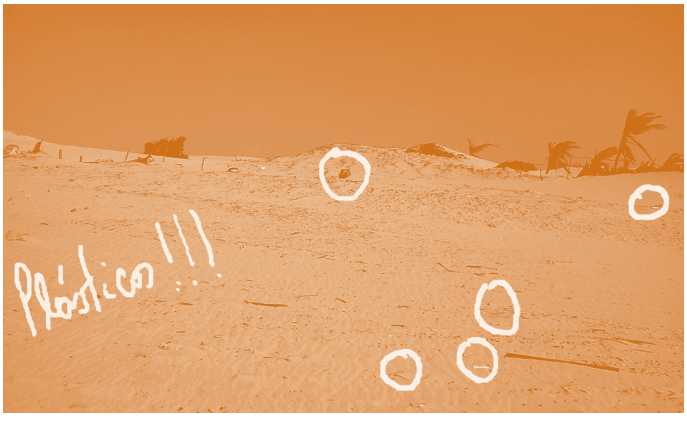

FIG. 8 Macroplastics found on Caburé beach, in Lençóis Maranhenses (Maranhão/Brazil). Source: Wilson Kindlein Júnior.

And even worse, polymer degrades in bad weather due to the crosslinks of oxygen with carbon, which quite often causes the polymer to fragment into microplastics (remnants of material in pieces smaller than 5.0 mm – some of these microplastics can be seen in **FIGURE 9**). These remnants (macro or microplastics) reach places as remote as Caburé beach, in Lençóis Maranhenses (Maranhão/Brazil). The microplastics can be consumed by fish and other animals, thus interfering in the entire food chain.

FIG. 9 Microplastics found on Caburé beach in Lençóis Maranhenses (Maranhão/Brazil). Source: Wilson Kindlein Júnior.

This maxim of discarding (abandonment) is further supported in products that are increasingly discardable (disposable plates, disposable glasses, disposable electric and electronic appliances, disposable blades, etc.), and in disposable social relations, as can be seen on TV, "call number XXX to eliminate candidate A, or number YYY to eliminate candidate B". The logic founded on disposability is the same, ie., to eliminate, reject, let go, abandon, do away with, suppress, abolish, etc. This logic goes against actions that aim at sustaining, supporting, helping, protecting and safeguarding. Thus, it is necessary to combat any action that will take time from us. The shortest path is usually not the most sensible one. It is important to be able to wind down the speed (to combat hurry, hustle and bustle, lack of attention), because without time there is no home, and we should remember that if planet Earth is our home, and if "home is the time here I want to be", then we have to make good use of our time (repeat, consolidate, remain). Slow down the hustle and bustle, be consistent and running around, be consistent and about, have consistency and lounge about. If we do not slow down what will be our home?

LESSONS FROM PLASTIC AND CARDBOARD CITIES: WASTE, DESIGN AND THE VIEW FROM THE EDGE

MARIA CECILIA LOSCHIAVO DOS SANTOS

Over the last 20 years I have been conducting research on homelessness, architecture and design. The material environment of the homeless culture is constructed from the trash of our technological and industrialized culture, creating plastic and cardboard cities that touch upon our daily life. Facing the experience of diving vertiginously into the shadows, into the depth of the material that allows the construction of a fragile habitat, moved by the need for shelter, homeless people have transformed contemporary city life.

The study of the survival repertoires and ecology of the homeless in Sao Paulo, Los Angeles and Tokyo took years to complete and it has become intertwined with another research about a phenomenon strongly connected to design: the development and spread of a massive process of urban rubbish excavation – *catação* – that has become a source of survival and a new strategy of income generation for deprived people: they transformed waste into resource for life.

In Brazil, since the seventies, a group of homeless people engaged in excavating the waste from the streets of the major cities, starting thus a collecting practice that gave rise to an informal economy called *catação*, performed by recyclable material collectors. Collecting and recycling discarded mass produced objects and materials is now a central activity for *catadores*, who with their activism have created a strong social movement.

It is necessary to stress that collectors have an extensive contribution as environment protection agents who provide a relevant public service to Brazil, as they clean our cities. They played an important role in the struggle for approving the National Policy of Solid Waste – Política Nacional de Resíduos Sólidos – Lei 12.305/10, 2010. Despite this contribution, they are not fully recognized for the provision of a public service and for their contribution to the social and economic life of the city through re-using and eliminating waste.

Working with the homeless and the collectors has been a process of exchange and learning and has given design new meaning and challenges. This chapter presents a reflection upon this phenomenon, looking at the sidewalks from cities of plastic and cardboard intertwined with the massive ongoing process of urban waste excavation.

The study of the homeless material culture and the recyclable material collectors also has fostered and nurtured a fruitful design research mentorship and educational experience since the year of 1998 to the present at the School of Architecture and Urbanism [*FAU*], University of Sao Paulo, with intense support of undergraduate and graduate students.

With funding from The National Council for Scientific and Technological Development [*CNPq*], I am leading the research PRODUCT DESIGN, SUSTAINABILITY AND THE NATIONAL POLICY ON SOLID WASTES [*DESIGN DE PRODUTO, SUSTENTABILIDADE E A POLÍTICA NACIONAL DE RESÍDUOS SÓLIDOS*] looking at product design, sustainability, solid waste, collectors and the national policy of solid waste, whose main objective is to analyze the aspects of design present in law number 12.305/2010 – PNRS – Política Nacional dos Resíduos Sólidos.

For a long time design has been considered a minor discipline, "it was a non-issue" according to Bonsiepe (BONSIEPE, 2007, P. 30), in the trajectory of the concept it also underwent a *yuppiefication* and popularisations process, with "inflationary usage" (BONSIEPE, 2007, P. 26), but currently design is considered as a more all-encompassing field, intertwined with other disciplines in an inter-multi-trans-disciplinary perspective.

Tony Fry considers design as a "world shaping force", a political field, stressing its political role (FRY, 2009) Design futuring. According to him "in actuality, design is one of the main operative agents of the social, cultural and economic functioning and dysfunctioning of humanity's made world" (FRY, 2009, P. 25).

This political dimension of design is highly relevant for understanding waste issues. Waste goes together with luxury and excess, but at the same time in contemporary world it constitutes the main means and strategies of subsistence and adaptation for deprived population. Waste is present, in a broad range in: homeless lifestyles and routines, homeless living arrangements on the

sidewalks, homeless practices of reusing materials and products for daily life objects makeshift, homeless and/or collectors practices of mining for materials reintroducing them into productive cycle.

Homelessness and waste are pressing issues of our times and the interaction of these two issues became strongly visible in urban areas, generating public attention, concern and urgent action.

The political significance of design is also an important element for design education curriculum and in this sense it was a key point of concerning for Aloisio Magalhães (1927-1982). He was a designer and professor of design in Brazil. He had the sensibility to look at the essence of Brazilian design with its wide diversity. It embraces the "distance between the Paleolithic Age and the Computer", he said in his speech celebrating the 15th anniversary of the first Brazilian design school in Rio de Janeiro, Escola Superior de Desenho Industrial [*ESDI*].

The speech "What can industrial design do for the country? Towards a new concept and an ethics of industrial design" (*"O que o desenho industrial pode fazer pelo país? Por uma nova conceituação e uma ética do desenho industrial")* (1977), was a reflection on the curriculum within the school responsible for the introduction of design education in Brazil. It raises a question on the nature of design in Brazil, where

> *[...] the contrasting and unequal nature of the development process causes problems [...] which requires a positioning with extremely wide latitudes: the awareness of how few resources we have for the size of the territorial space; the ethical responsibility of diminishing the contrast between small, highly concentrated areas of wealth and benefits, and large rarefied, poor areas. In the latter only the latent wealth of authenticity and originality of the Brazilian cultures is weighty. In the former, the lack of originality was replaced by the exuberant presence of copying and the mimetic taste for other cultural values.*

The awareness of this gap between "Brazils" provides designers with a relevant framework to re-situate how they could turn their design skills into practical tools for social change. In my academic and educational experience it became a seminal theoretical and methodological text. Among other ideas, he stresses: the interdisciplinary character of Industrial Design, an activity born from the need to "establish a relationship between various knowledge"; the spontaneous and intuitive nature of our Latin temperament; the original values of an autochthonous culture of the Brazilian indigenous peoples, of the peoples of African origins, as basic components of our cultural formation.

Finally, he concludes his argument pointing out that: “we move in a broad spectrum of diversities of knowledges and situations that are very distant: from Paleolithic to the computer”. Wouldn’t these be a few indications for a new concept of the activity? Is that not the task we should perform? (MAGALHÃES, 1998).

In the Brazilian context, minding the gap between the stone age and the computer, requires the production of knowledge outside the framework of colonialism, it means also changing the mindset regarding the dominant way of design research mainly oriented towards wealthy and author design and finally it means listening to the various research agendas proposed by students. They are so deeply immersed in their cultural and social needs, that they have a judgment and interpretation of the design knowledge gaps in their own contexts, listening to otherness, such as the homeless and recyclable material collectors.

Interpretation of these stories is a central aspect for a knowledge outside the framework of colonialism and according to Edward Said, interpretations are “situational” they “depend very much on who the interpreter is, who he or she is addressing, what his or her purpose is in interpreting, at what historical moment the interpretation takes place”.

Situational interpretation addresses the issue of what it means to live in the borderland between self-enablement and victimhood. Understanding what it means and feels to be in this situation can only be known by people who are actually so positioned. However, it is important for the complexity of the lives of these people these issues to be recognized, otherwise stereotypical charitable approaches towards these people by ‘well intended benefactors’ will continue to fail. Following this evidence, these studies show the potential of design research in marginalized populations in the context of their struggles. They reveal how unhelpful stereotypical thinking turns out to be by insisting on ‘revealing’ the life of the homeless and the collectors as only the somber and ugly and by romanticizing homelessness as without the constraints of normal everyday life.

This idea is supported by the words of José de Souza Martins (2008), who expressed his belief that “The political and charitable discourse about street people is poor in content, because it neglects the imaginative competency of the poor. Therefore we face a contradiction that creates an abyss between a poor person who has a rich imagination, and those who say they are helping him, people who are comparatively rich, and are poor in imagination about poverty”. Survival, as life lived at its most basic, imposes its own language and culture (which can evidence a rich imagination). This is also seen in those communities who create and occupy informal habitat and demonstrate Here is a larger frame of Do It Yourself (DIY) logic along with its ability to cycle the ‘used-abandonment-disposed of’ and the need to recycle and re-use in other ways.

Consequently, the question raised by this frame is “What are the consequences of recognizing this practice by people who are deprived and respond to homelessness by employing discarded materials and in so doing establish a kind of vernacular design?” Philosopher Gilda de Mello e Souza, by deploying a broad ranging thinking that recognizes the role of design as a very important form of expression, gives us the key to understanding the aesthetic regime, culture and objects produced by the homeless population.

Commenting on the inheritance of the first group of French professors — Lévi-Strauss, Jean Maugüé, Roger Bastide — who all came to teach Aesthetics in the Philosophy Department of the University of Sao Paulo - she expressed and developed, a concept based on the notion of the “rich aesthetic” and the “poor aesthetic” (*estética pobre e estética rica*), which is crucial to understanding the ephemeral aesthetic of vernacular design.

According to Souza:

> *“In opposition to the Aesthetics of Classicism of Jean Maugüé and Lévi-Strauss, and especially the analysis of Roger Bastide, which focused on another concept of art (...)His Aesthetics is the anthropologist Aesthetics, and of a scholar of the phenomenon of religious mysticism. But it is also an Aesthetics of vanguard. In his early youth Bastide went through Dadaism and Surrealism influences, through radical experiences that raised questions for ever about the eternal values of art. It was natural that, arriveing in a country he believed to be without a great cultural tradition, he concentrated on this elaboration of the “poor aesthetic”, using the term in analogy to what today is designated as poor art, that is an Aesthetics that does not consider great periods and great artistic manifestations, and that took the aesthetical phenomenon from daily life, from insignificant facts and without greatness, but compounding the fabric of our life”* (SOUZA, 1980)

Finally, Souza pointed out that: “it is an aesthetic that is not concerned with being a work of art — much less a masterpiece — it reveals magical qualities, one of the most valid and highest forms of knowledge” (SOUZA, 1980).

This is a time of dilemmas confronting a new generation of people who are desperately poor, jobless, unhealthy, refugees of climate catastrophes, war, ethnic wars. Design must also be considered in this context of life on the edge. Margins and edges offer us a possibility of rethinking and changing design research and education, raising thus profound critiques of knowledge production in itself. Integrating waste in design research agenda is a contribution in that direction.

In the Brazilian framework, closing the gap of design knowledge is not an one way process, it is actually a process of exchange and mutual learning. Obviously this requires the production of knowledge outside the framework of colonialism. This includes listening to the various research agendas proposed by students and scholars. They are committed and deeply immersed in their cultural and social needs of their physical milieu. Likewise, they are able to exercise judgment, interpretation skills, design knowledge and address gaps in their own contextual understanding, in the spirit of Edward Said's definition of "situational" interpretations that "depend very much on who the interpreter is, who he or she is addressing, what his or her purpose is in interpreting, at what historical moment the interpretation takes place".

STORIES FROM THE SIDEWALK: THE MAKING OF THE INFORMAL HABITAT

A glimpse of life on the streets in the late 20th and early 21st centuries in Los Angeles, Sao Paulo, and Tokyo confronts us with the dramatic phenomenon that is characteristic of the large metropolises: a spatial and urban concentration of poverty, deprivation and human suffering in astonishing proportions. The development model contributes to social exclusion; it produces unemployment, indebtedness and homelessness. This is a perverse process, which affects people individually but, above all, it is part of a complex logic of economic, social, cultural and political relations of global capitalism, and at the heart of this process is the issue of land ownership, the right to land, the right to the city.

In Brazil the phenomenon presents specific aspects. We live in an exclusion cycle that feeds on itself and self-perpetuates, especially taking into account the incongruities of the development of our metropolises and the clamorous social and economic inequalities found in our country.

Unemployment and exclusion have been creating an own culture of informal workers and homeless. The latter have become the masters of their own destiny, due to the complete state of neglect to which they have been abandoned.

What does the urban environment offer to implement the habitats of the homeless? It is in the central regions that they ultimately have access to this market of leftovers. Nowadays, downtown areas of cities are places where

things are discarded, where there are wastes, where the consumer society's culture of waste is most visible. There one can dig for things ranging from white paper or cardboard, to aluminum, and based on these wastes, set up survival strategies, which vary from one moment to the next. The central area, both in Los Angeles and in Sao Paulo and Tokyo, therefore at night are areas where the homeless can use the urban built-up environment to set up their fragile, provisory structures and spend the night. In the areas surrounding this center, one notes the construction of structures, sleeping arrangements, and relatively more durable informal habitats. All of these habitats ultimately have a significant influence on life in the city, leading to new uses of the public spaces, which frequently generate varied and adverse reactions among the city inhabitants.

The spaces below the Minhocão, a long viaduct in the city of São Paulo; the plastic condominiums in Skid Row, downtown Los Angeles; the cardboard condominiums at the Shinju-ku station in Tokyo are examples of spaces of resistance and transgression. It is certain that the specific conditions of production of each of these condominiums are different, but all of them are expressions of the universal problem of territorial reorganization.

The settlement, occupation and appropriation of public spaces by the homeless presents its own logic. The daytime occupation follows certain principles that differ from nighttime occupation. At night the homeless take refuge in more deserted areas, and are less visible to the public eye, but more vulnerable to their own community or to other people who frequent the street. There are indeterminate spaces, that are left over, these become niches for the homeless, such as for instance the occupation of the central islands of avenues, the areas below the viaducts, bridges, or even cavities inside public structures. There are green spaces, parks and gardens where they build a habitat in quieter areas and can achieve a certain amount of privacy. There are also public spaces in central regions which provide the opportunity for greater contact with the passersby, with train or subway passengers, providing opportunities for begging, doing odd jobs, and so on.

In the famous essay "Des espaces autres" [On other spaces] (FOUCAULT, 1986), Foucault argues that while the privileged category of the nineteenth century was history and time, the relevant category in the late 20th century was space.

According to him:

[...] we are in the age of the simultaneous, of juxtaposition, the near and the far, the side by side and the scattered. A period in which, in my view, the world is putting itself to test not so much as a great way of life destined to grow in time but as a net that links points together and

creates its own muddle. It might be said that certain ideological conflicts, which underlie the controversies of our day take place between pious descendants of time and tenacious inhabitants of space (FOUCAULT, 1986).

Foucault interest in space arrangements led him to identify two general types: utopias and heterotopias and he considers heterotopias "privileged, sacred or forbidden places, often reserved for the individual in a crisis" (FOUCAULT, 1986). Heterotopias seem to have a function of forming another space and the existence of this other space is crucial to the understanding of spatial practices of the homeless, the recyclable material collectors among others.

Foucault says that the connections between space, knowledge, power and cultural policy should be seen at the same time as oppressive and enabling, composed not only of authoritarian dangers, but also of possibilities for resistance.

This sense of practicing resistance should be highlighted regarding the material culture of the homeless. These are the urban bricolages. According to Lévi-Strauss, bricoleur is "someone who works with his hands and uses clever means, compared to other means used by artisans". He goes on to say,

"[...] the bricoleur is good at performing a large number of tasks, but differently from the engineer he does not subordinate each of them to the availability of raw materials and instruments created and sought for the purpose of the project. His universe of instruments is nearby, and the rules of his game are always to do with anything he has to hand." [1]

Remarking on the homeless people's strategies of survival material, David Snow uses this concept. He analyzes the improvisations performed by the homeless in terms of bricolages, and defines the concept of bricoleur as follows: "used metaphorically, bricoleurs may designate any individual that invents non-conventional but pragmatic solutions to urgent problems".[2]

The material culture of the homeless bricoleur is a product typical of a globalized social and economic reality and of marginalization which expands increasingly, throwing waves and waves of people on to the streets, on a worldwide scale.

Common features are found in the homeless bricolages in Sao Paulo, Los Angeles and Tokyo, such as the presence of the imaginary lost home in all of the informal habitats in the mentioned cities. This imaginary is an evocation

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1 Lévi-Strauss, Claude. The savage mind. London, Weidenfeld and Nicolson, 1966.

2 SNOW, David et alli. Material Survival Strategies on the street. Homeless People as Bricoleurs. In. Baumohl, J. (ed.) Homelessness in America. Phoenix, Oryx Press, 1996.

of the cultural patterns of each country, which are expressed in the microcosm of the house on the street. During interviews it could be found that the greatest problem of these habitats concerns the impossibility of fulfilling the homeless physical hygiene needs: a daily bath and bodily functions. Thus, the home on the street provides basic shelter for staying and spending the night, but hygiene must be looked for either at services and institutions, or in the street itself, which, for all those interviewed, is felt to be a horrible humiliation.

I would like to share the voices of the homeless about how, in the three cities, they experience the issue of producing the house on the street, and of how the homeless work on the issues referring to the occupancy of the public spaces. On a cold night in February 1999, a homeless person from this park told me his story:

> *"I have lived in the park since 1998 and found my way to this camp through a friend who helped me. He found this place and invited me. I have many friends in Shinjuku. I built my house among the trees, right in front of the public bathroom, because as you know water and a bathroom are essential for life. Here in Shinjuku I find everything I need in the trash, and I am surprised at the number of things that are thrown away in this city."*

FIG. 1 Homeless shelter, Los Angeles. Source: Maria Cecilia Loschiavo dos Santos.

On a morning in July 1998, L., a homeless woman in the city of São Paulo declared:

> *"We make the space, our home is in the street. With cardboard, plastic, cloths, old sheets and anything we get out of the trash, we create a cozy home and also a kitchen. Come, and I'll show you."* [3]

[3] Interview with the author, Sao Paulo, 1998.

On the banks of one of the main rivers in Tokyo, on a freezing morning in February 1999, M., a homeless man, told me about his house:

"I have lived on Sumida River since 1995. First I lived in a 'cardboard house' [danoboru], then I moved to a 'house of blue plastic' [biniru brue shitu], and now I am in a house of white plastic. The blue plastic is weak, it breaks easily, I have to fix it all the time Gradually I found that white plastic is more resistant and durable, and that it brings more light into my house. I love the light. Because I have lived here for a long time, I worked very hard in construction companies, this land belongs to me. What I have in this house would be impossible to have, even in a cheap hotel room in the Sanya neighborhood. I have a power generator, I have a TV, because in Japan they throw away things that are in a good condition. First I found a TV set that did not work, then I found a good one. Everything I have I found in the trash." [4]

FIG. 2 Homeless shelter, Sao Paulo. Source: Ken Straiton.

L., a Viet Nam war veteran, told me:

I know how to survive in the war. So I also know how to survive in the city [of Los Angeles]. My buggy needs to be well organized, and I must pack my belongings in appropriate bags to separate the food and the materials to go to the recycling center. When you live on the streets, every day is a trip. [5]

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[4] Interview with the author, Tóquio, 1999.

[5] Interview with the author, Los Angeles, 1995.

FIG. 3 Homeless shelter, Tokio. Source: Ken Straiton.

Inside these habitats, order is presided by a spirit of temporariness, by a logic of compact, vital packaging. Certain decorative elements were commonly found, living or artificial plants, cloth animals, teddy bears, dolls and broken toys, which compose a "domestic" ornamentation, materializing the meaning of the imaginary home that has been lost, expressing the individuality of each homeless person. Like in nests, there is a certain juxtaposition of cloths and covers that generate protection and coziness. Personal hygiene products, soap to wash clothes and disinfectants are also frequently found in these interiors, denoting the homeless' concern about maintaining their image.

The juxtaposition of images of the informal habitats , taken in the three cities studied, creates a visual dialogue and offers a multiple interpretation of the material culture, of visibility, of the strategies of resistance, of identity, of the imagination of the house possessed by the homeless person.

The landscape of poverty in the city of Los Angeles also presents a variety of arrangements and habitats different from that of Tokyo due to a number of factors that include materials available, climate, specific skills of the homeless, characteristics of the constructed environment incorporated to the informal habitats, among others.

In Tokyo, above all in the habitats build on the banks of Sumida or Arakawa rivers, a fine sense of space use and organization was found, with orthogonal arrangements, generally revealing the constructive skills of their creators, in which notions of cleanliness and order predominate. There many inhabitants

leave in the early hours of the morning, for their daily pilgrimage to the yoseba, the labor market, where daily workers are chosen for civil construction.

On the other hand, on Skid Row, in Los Angeles, the atmosphere greatly resembles the negligent landscape of certain downtown areas in Sao Paulo, where habitats predominate amidst disorder, debris, chaos and refuse.

The comparison of the house on the street in allows one to understand the universal language of need and anguish, but also practices of resistance in defense of life.

The degraded objects lay on the city streets, which are transformed in a true receptacle of discarded products. The ceaseless search for material survival strategies enabled the homeless and collectors to exhume these dead products assigning other meanings to them, establishing new relations building a new materiality based on them, allowing us to ask ourselves about the reuses of the products and materials, their consistency and effectiveness.

Finally it is important to consider another dimension of discarded products. At the beginning of the 21st century the increasing consumption of tablets, smart phones, flat screens among other electronic products constitute a significant part of our urban waste and they end up illegally intoxicating distant countries in Africa and other areas. A recent study by the UN forecasts that e-waste will increase 1/3 until 2017, representing thus an amount of 65.4 millions of tons, maybe popular scenes such the fiction movie Wall E will turned into reality, but one thing is true, we can not scape to nowhere.

SUSTAINABLE DEVELOPMENT AND DESIGN

In Brazil and other parts of the world economic poverty is a prevalent phenomenon. Differences in levels of development are huge. The way of life of wealthy people occupy an unreasonably big space. The consequences of production and consumption patterns are neither environmentally nor socially just. In 1987 the Brundtland Report (World Commission on Environment and Development of the United Nations focused on the role of social equity as one of the key condition to be considered for sustainable development. According to this report the unequal distribution of resources are fundamental causes of environmental problems. Now 27 years later the social equity dimension and its strong relation to the environment still receive insufficient attention and challenges knowledge production. What changes are necessary in order to go

from unsustainable and unequal development to a sustainable and more just development? And which are the implications for design?

Design practices could make a contribution in the mentioned context, for example design could collaborate to the advancement of the collectors activities, and providing visibility to their condition and improving their image. Design could also learn and communicate about the homeless and the recyclable material collectors movements bringing attention and awareness about their nature, mechanisms and effectiveness thus changing public perception. Design could also collaborate directly in the dynamic and flow of materials collectors collect and sort. At this point educational experiences on design could be very relevant because they bring new visions and experiential learning possibilities.

HOW WILL BE OUR URBAN FUTURE? HOW PEOPLE CAN CHANGE? WHAT ARE THE HORIZONS?

The homeless economy and subsistence repertoires together with the recovery of reused materials and products by the collector convey a very complex relationship, it is not only the other space as argued by Michel Foucault, but also another economy where design is present and designs with the already designed and discarded. In a fictional future description, Tony Fry argues:

> *Gatherers of the future are going to continue to be tribal communities, collectors and remakers. They will continue to extend their critical capability of seeing the reconstructive potential in things found. In so doing, they will have the ability to elevate recycling to a new kind of technology. Already they "feed" off things from the old world (from any domain of manufacture, in any material) to make something quite new. Remarkably, in their care for and of the world around them, they feel themselves to be "futural"* (FRY, 2012, P. 208)

I am very thankful to the collectors and the homeless community who have welcomed me and my students and visiting scholars, in their working and living spaces and who have provided invaluable information, knowledge and friendship.

ACKNOWLEDGMENTS TO FAPESP, CNPq, CENTRE CANADIEN D'ARCHITECTURE (CCA), UNIVERSITY OF CALIFORNIA – LOS ANGELES (UCLA).

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CONTRIBUTING THROUGH DESIGN

ECODESIGN AND COMPLEXITY IN THE PACKAGING LIFE CYCLE

ANDRÉA FRANCO PEREIRA

The use of packaging changes the behavior of consumers who unresistingly adapt to the more easily handled packaged products. Actually, we have developed a culture of packaging that defines significant aspects of the identity of our society. Their presence is prior to the pre-industrial period, and with the rise of industry their use became even more significant.

The constant growth of packaging production in the industrial era is, above all, due to its capacity to assimilate the way of using the products and its capacity to simplify consumption.

The production of packaging in Brazil follows worldwide technological innovations, the trend to the globalization of technology and the production/transformation techniques that use mainly materials such as: paper and cardboard, glass, plastics and metals. The differences observed, however, concern the evolutions of the market, ie., the relationship between growth of production and the increased purchasing power of society.

For the food processing industry packaging is irrefutably important due to the gains provided by its functions. Succintly we may say that the functions of packaging can be classified into two main groups (SANTOS E PEREIRA, 1998):

» **CONSERVATION FUNCTION**: to contain the products in a solid, liquid or gaseous state; to make the products easier to transport; to be hermetic and prevent external contact with water, moisture, insects, etc; to avoid product deterioration;

• **EASY CONSUMPTION FUNCTION**: to inform – to provide support in communication between the manufacturer and the consumer regarding the legal and usability requirements; to increase the duration for consumption and to maintain the initial quality of the product; to be easy to use and "reuse"; to improve sales.

In brief, the packagings present a functional logic whose purpose is to supply a product (food, medication, electrical appliances, etc.) in appropriate conditions to the end consumer. On carrying out these functions, in the case of foods, the packaging has a very important positive aspect point regarding diminished losses. However problems of use (contaminations, accidents, easy use, etc) and, above all, production of waste are also present.

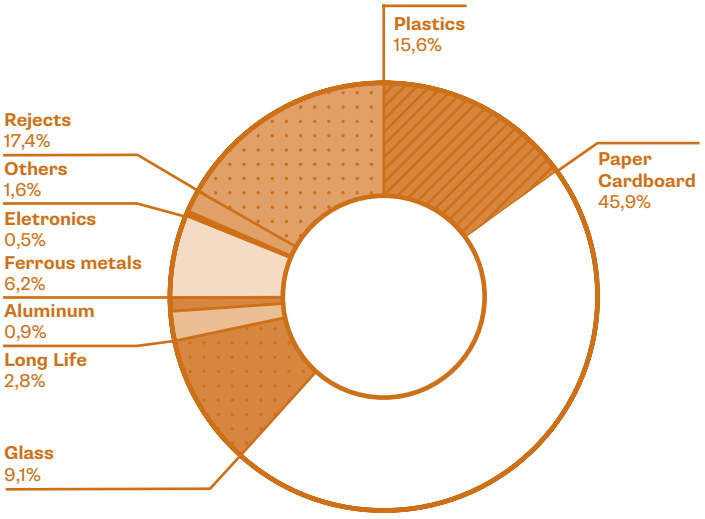
Thus, increasingly the production and market require innovative packaging that allows conservation and durability of the products without, however, provoking higher economic and environmental costs. This means research and the introduction of new materials, replacing old ones, such as biomaterials, highlighting the biopolymers produced from biopolyesters (such as, for instance PEF – furonoate polyethylene replacing PET- polyethylene terephthalate, from polyester, derived from oil), but also compostable or biodegradable biopolymers. Plant based paints and agglutinants, as for instance, soy bean oil, are also important in the packaging industry, because besides replacing oils and mineral compounds, reducing the amount of VOC (volatile organic compound) released duing printing causes less damage to the paper fibers for recycling.

The reduction of environmental impacts caused by the packaging should thus be taken into accountconsidered in design, in the life cycle, replacing materials by renewable raw materials, reducing the amount of material at the source, prioritizing monomaterials to made sorting easier, and seeking design solutions that will enhance the value of recycling.

PACKAGING AND RECYCLING WASTE

Problems involving garbage production are still very present, showing that solutions should always be up to date in terms of novelty and technology. According to a survey performed by Compromisso Empresarial pela Reciclagem – Cempre [Entrepreneurial Commitment to Recycling] (**FIGURE 1**), "paper / cardboard clippings continue to be the types of recyclable materials most collected by municipal selective collection system (in weight), followed by plastics in general, glass, metal and long life packaging" CEMPRE (2012(A)).

GRAVIMETRIC COMPOSITION MEDIUM OF SELECTIVE COLLECTION



PROFILE OF PLASTICS

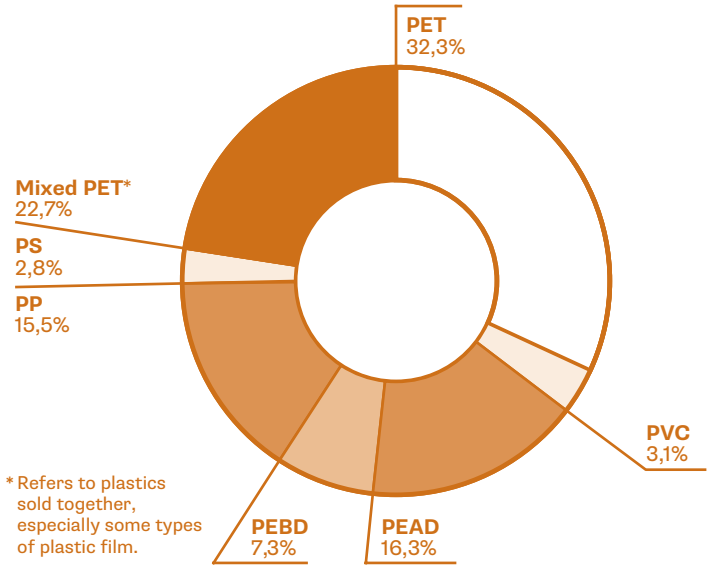


FIG. 1 Composição de materiais na coleta seletiva do Brasil. Fonte: CEMPRE, 2012 (a).
Composição de materiais na coleta seletiva do Brasil. Fonte: CEMPRE, 2012 (a).

Although paper/cardboard is the paper most often found in packaging and is the main item collected, about 46%, it has a much lower market value compared to aluminum whose representativity in the volume collected is very

low, 0.9%, and even to PET, which is about 30% of the total volume (16%) of plastics collected. According to data provided by Cempre, the price of recyclable cardboard material corresponds, on average, to R$ 250.00 per ton, almost 10 times less than a ton of aluminum (on average R$ 2,400.00), and 5 times less than a ton of PET (on average R$ 1,300.00).

Enhancing the value of recyclable raw material on the market is one of the most important conditions to stimulate an increase in the recycling indices, an example shown by aluminum. In this sense the contribution of design is essential to propose new products in order to enhance the value of this raw material, effectively optimizing its recycling, use in larger scale production and with more advanced technologies.

Although there have been increases, the recycling rates could be better for most of the packaging materials, except for aluminum cans and corrugated cardboard, as shown in Summary **TABLE 1.**

Packaging materials	Recycling in 2000
Aluminum [mainly cans - other metals not included]	78%
Steel [cans]	-
Glass	41%
Cardboard	70%
PET [other plastics not included]	24%
Plastics	-
Long Life carton packaging	-

TAB. 1 Comparison of recycling indices of packaging materials in Brazil over 10 years. Source: ABAL (Associação Brasileira de Alumínio), ABIVIDRO (Associação Brasileira das indústrias de vidro), ABREPET (Associação Brasileira dos Fabricantes de Embalagem de PET), BRACELPA (Associação Brasileira de Celulose e Papel), CEMPRE (Compromisso Empresarial pela Reciclagem), PEREIRA e SANTOS, 2002.

According to data from Cempre (2012(a)), currently about 14% of the Brazilian municipalities have selective collection (**FIGURE 2**). In other words, 86% of the household waste produced in Brazil goes to landfill or garbage dumps, including the packaging.

These data show, on the one hand, that the success of recycling, especially aluminum cans, cardboard and PET, is undeniably due to the collaboration of recyclable material pickers. On the other hand, it reveals the complexity underlying this system.

MUNICIPALITIES AND REGIONALIZATION OF SELECTIVE COLLECTION IN BRAZIL

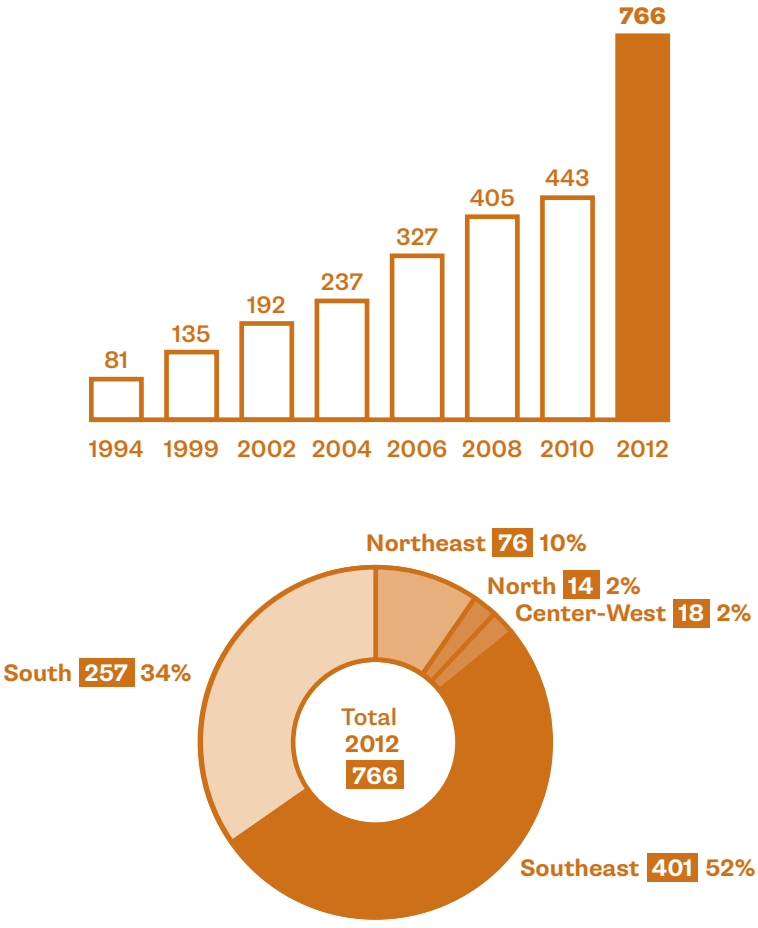


FIG. 2 Municipalities with selective collection in Brazil. Font: CEMPRE, 2012 (a).

COMPLEXITY OF COLLECTION AND SORTING TO OBTAIN RECYCLED MATERIAL

Actually, both the solutions proposed for the packaging and those proposed for objects that use recycled packaging materials are essential for the system to work properly. When designing the packaging, for instance, solutions should be foreseen enabling easier household sorting of the materials. Difficulties

clearly linked to the products, such as the identification of the various type of materials, the logistics of collection and household sorting, public of the collection associations and independent pickers, as well as the enhancement of the material after recycling are evidence of the importance of the role of design in the context of attempting to reduce the garbage. Convenient performance of the solutions adopted depends on considering, during the packaging design phase, factors such as the difficulty of collecting and sorting the material, but it depends also on the innovative use of the recycled material in new products.

Inefficiency and poor performance of the solutions presented to the problem "consumer products/environment", is connected, in many cases, to system complexity (PEREIRA, 2001). For instance, the "collection/sorting" = recycling/diminished garbage" process (**FIGURE 3**) forms an ensemble in which adequate functioning depends on the conjugation between a municipal public organization, compliance of the population and compliance of private companies. For the solutiosn to be more satisfactory it is necessary to understand all these interactions. Understanding a context in its systemic aspect, requires understand it as a whole, understanding the interactions established between the parts (that could provoke changes in the behavior of these parts) and understanding the influence of these interactions on the system itself (BERTALANFFY, 1993; LE MOIGNE, 1994; LE MOIGNE, 1995; MORIN, 1977; MORIN, 1991).

DOMESTIC PACKAGING AND GARBAGE SYSTEM

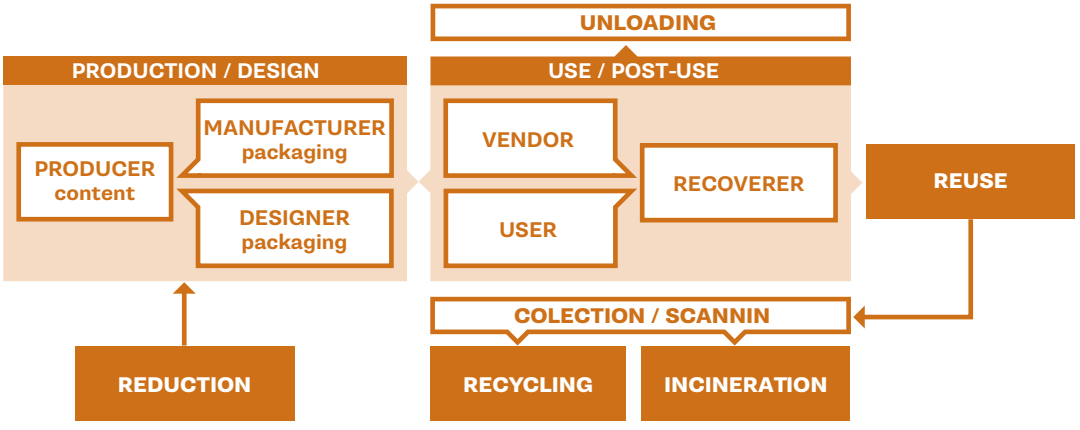


FIG. 3 Technical-human system of household packagings and garbage. Source: Pereira, 2001.

It should therefore be remembered that each phase of the life cycle of packaging will be inevitably linked to the others. In this sense, the designers' proposal of new uses that will enhance the value of the materials, and the articulation of the different actors involved in the system, including the industrial sector, is necessary and even urgent.

When designing the packaging or the pre-recycling product, it is necessary to consider not only the adoption of technical solutions to reduce the volume of material use and for the use of recyclable material, but also the need to take into account the entire material treatment chain: collection and household sorting, that done by public administration and by the pickers associations, the material recycling process and manufacturing the new product. All of this aims at enhancing the value of recycling. Now, despite the importance of reducing the volume of raw material used, and of the initiatives to reuse the packaging, recycling is still the key to the problem of reducing the trash produced by packaging.

Almost all materials used in the consumer products, and all the packaging materials are technically recyclable, which does not mean that they are in fact recycled.

When designing the new product, or the post-recycling product, the use of materials that have been recycled presents several economic, technical and legislative limitations (in packaging foods and medication, etc.). However, their use can be immediately seen in several other products adding value to the material by means of the planned intervention of design professionals. Summary **TABLE 2** shows the factors of material contamination presented by Cempre, which may make it difficult to recycle and reuse the material as raw material.

It is essential to understand these limitations in order to design products, since this makes the solutions proposed for packaging more appropriate from the standpoint both of selective collection and sorting at all levels (in the household, in the municipality, at the sorting centers and in tthe pickers' associations) in the recycling process proper, reducing costs, increasing profitability and enhancing the value of the material as raw material for new products. These products have a greater added value, since they are manufactured from higher quality raw material.

LIMITING FACTOR FOR PACKAGING RECYCLING

Material	Contamination factors
Aluminum [cans]	The cans mixed with the rest of the waste may be contaminated with organic matter, excess moisture, plastic, glass, sand and other metals, making them difficult to recover for more noble uses. The graphic paints on the packaging are destroyed in the foundry furnaces during aluminum reprocessing and therefore are no problem in recycling. Irons.
Steel [cans]	The cans should be free of impurities contained in the waste, especially soil and other metallic materials, such as aluminum. The presence of organic matter generates more slag in the foundry furnaces.
Glass	Crystals, mirrors, lamps and plane glass used in cars and in civil construction, soil, stones, ceramics, crockery, plastics and excess metals. Should be preferentially separated by color.
Cardboard	Was, plastic, oil stains, soil, pieces of wood, string, ropes, metals, glasses, excess moisture, paints used in manufacturing cardboard, antihumidification treatment with water-insoluble resins.
PET	Adhesives (glue) used on the label and other plastics with the same density, such as polyvinyl chloride (PVC), and also PVC that is used for other kinds of bottle and cannot be mixed with PET scrap. The lid (polypropylene PP, high density polyethylene, PEAD or aluminum) Aluminum is tolerated up to 50 ppm.
Plastics	Diversity of plastic resins: there are seven different families of plastics that are often not chemically compatible with each other. Mixing some types may result in defective, low quality materials, without the technical specifications required to return to production as raw material. In addition, food, fats, paper, labels, staples, and dirt in general, reducing their sale price.
Long Life	There are no limitations to the recycling and reuse of all their layers.

TAB. 2 Limiting factor for packaging recycling. Source: Source: CEMPRE (2012(b)). Adapted by the author. Source: CEMPRE (2012(b)). Adapted by the author.

CRITERIA FOR PACKAGING ECODESIGN

Based on the technical-human system model of household packaging proposed by Pereira (2001), and shown in **FIGURE 3**, and according to the observations described above, Summary **TABLE 3**, below, presents a proposal of criteria to be taken into account in designing the packaging, considering its life cycle.

Underlying these criteria is the importance of understanding the complexity of the environmental problems, especially characterized by the interaction of several factors. Most of them originate in interactions present in the complex organization of selective collection and sorting of the household waste. Recognizing the problems involved allows establishing a procedure to design

CRITERIA FOR ECODESIGN OF THE PACKAGING LINKED TO ITS LIFE CYCLE

Phase	Criteria	Objective / research
Production	Reduction at the source	To diminish the weight of material per packaging/ to seek technological solutions and propose new, more structural geometries
	Use of renewable raw material	To reduce pressure on reserves of non-renewable materials/ to seek technological solutions and replace materials
Use	Incentive to household sorting	To contribute to the success of selection collection after sorting by the user/ to propose intuitive solutions that simplify household sorting.
	Use of monomaterial	To contribute to the success of household sorting and reduce contamination problems/ to prioritize monomaterial and fitting, diminishing adhesives
Post-use	Observation of contaminations	To contribute to improving recycling/ taking into account the factor of contamination of packaging material to minimize it in product design
	Enhancing the value of recycled material	To add value/ to seek an opportunity and propose solutions for products with a potential to add value, to disseminate the importance of recycled use.

TAB. 3 Criteria for ecodesign of the packaging linked to its life cycle.
Source: Elaborated by the author.

products which integrates technical factors of production and economic factors, besides socioorganizational factors. The identification of these interactions, their interests and incompatibilities, taken into account when designing the packaging, will certainly help adopt environmentally more appropriate and socially inclusive solutions.

ALUMINUM: RECYCLING SUCCESS

Aluminum is markedly important for the industry as a whole and for the packaging sector, and this is due to properties such as lightness, great resistance to corrosion and low fusion point. In Brazil the packaging sector is the greatest consumer of aluminum, and represents about 30% of the total amount of aluminum consumed (ABAL, 2007).

Actually, the packaging industry consumes a large part of the aluminum produced worldwide. So that we can have an idea of what it is in the United States the industry consumes 24% of the total amount used, as shown in Summary **TABLE 4** (BNDES, 2010).

ALUMINUM PER SECTOR

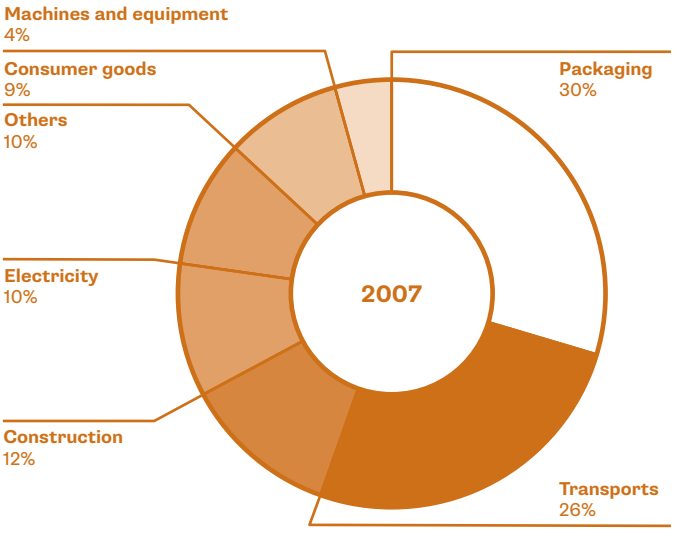


FIG.4 Distribution of aluminum consumption per sector. Source: Abal, 2007.

ALUMINUM CONSUMPTION PER SECTOR IN WHICH IT USED, IN 2006 AND 2010 (in 1000 tons)

Sector	USA		Western Europe		Japan	
	2006	2010	2006	2010	2006	2010
Transport / Transporte	3638	2303	2889	2292	1742	1624
Construction / Construção	1405	943	2113	1705	679	475
Packagings / Embalagens	1859	1725	677	706	434	424
Leaves / Folhas	742	583	996	978	154	130
Cables / Fios e cabos condutores	701	511	801	707	158	170
Durable goods / Bens duráveis	540	392	547	420	82	71
Machines and equipment / Máquinas e equipamentos	704	526	1072	911	312	223
Others / Outros	240	224	543	482	493	421
Total	**9829**	**7207**	**9638**	**8201**	**4054**	**3538**

TAB. 4 Aluminum consumption per sector in which it used, in 2006 and 2010. Source: CRU, 2009 (*Apud* BNDES, 2010).

The aluminum is obtained from bauxite extraction and processing, and "alumina (aluminum oxide) it obtained from its processing. This is the base for electrolytic aluminium production (primary aluminum)." (BNDES, 2010) Brazil is one of the greatest bauxite producers, but it is sixth in aluminum production and fifth in world consumption of aluminum. In 2008 Brazil consumed about 1,098, 700 tons. About 5 kg of bauxite are necessary to produce 1 kg of aluminum.

The aluminum industry consumes a lot of energy and, in Brazil, although only hydroelectricity is used, it consumes about 6% of the total energy generated (BNDES, 2010) This mean that "primary aluminum plants in Brazil operate at a mean intensity similar to the global average, 15.5 MWh/t". (ABAL, 2012, P. 37)

In this sense aluminum recycling is very advantageous, since besides saving natural resources (bauxite), energy consumption in the recycling process is 5% of the energy needed to produce primary aluminum. (ABAL, 2012, P. 46)

In 2011, Brazil recycled 98.3% aluminum cans and has been the number one recycler worldwide since 2001. According to ABAL,

> *This consistent result is supported by a reverse logistics chain structured over 20 years ago, that ensures a strong demand by offering good opportunities and pay to cooperatives and recyclers, creating jobs and income for thousands of people. In 2011 alone, the aluminum beverage cans collection stage injected R$ 645 milions into the national economy. All of this in a sector that, in 2012, expanded the can production capacity by 9.5% and has good prospects of continuing to grow. In addition, because the aluminum recycling process consumes only 5% of the electric energy compared to the production process of primary metal, this result provided Brazil with a saving of 3.780 GWh, an amount equivalent to the annual residential consumption of 6.5 million people in two million Brazilian households.* (ABAL, 2012, P. 48)

However, also as regards the varied aluminum scrap consumed by households, the country is above the world average (28.3%), in 2010 recycling 36.4% of the scrap. (ABAL, 2012)

Aluminum recyclability is indeed an important aspect to reaching high recycling rates. The advance in aluminum recycling technology allowed companies that melt down scrap again to become more competitive, improving the production chain as a whole. Currently, scrap is classified and delivered, selected and compressed into bales, which ensure greater productivity. This organization of the process, besides the own value of aluminum, means that scrap achieves highly enhanced prices, that are the highest among the recyclable packaging materials.

This aspect of aluminum recyclability, added to the organization acquired by the sector, brings the material increasingly close to a standard considered ideal, in a closed cycle, in which the entire chain refeeds from the recycled material, in a continuous flow, during the pre-production. production and post use phases, as shown in **FIGURE 5.**

MEAN PRICES OF ALUMINUM SCRAP PRICE PAID BY THE INDUSTRY

	Description	Mean price (R$/Kg)
1st week April/2013	Block	2,72
	Plating	3,22
	Pressed cans	2,90
	Loose cans or cans compressed into bales	2,71
	Pot	3,74
	White profile	4,20
	Mixed profile	3,73

TAB. 5 Mean prices of aluminum scrap price paid by the industry. Source: ABAL, 2013.

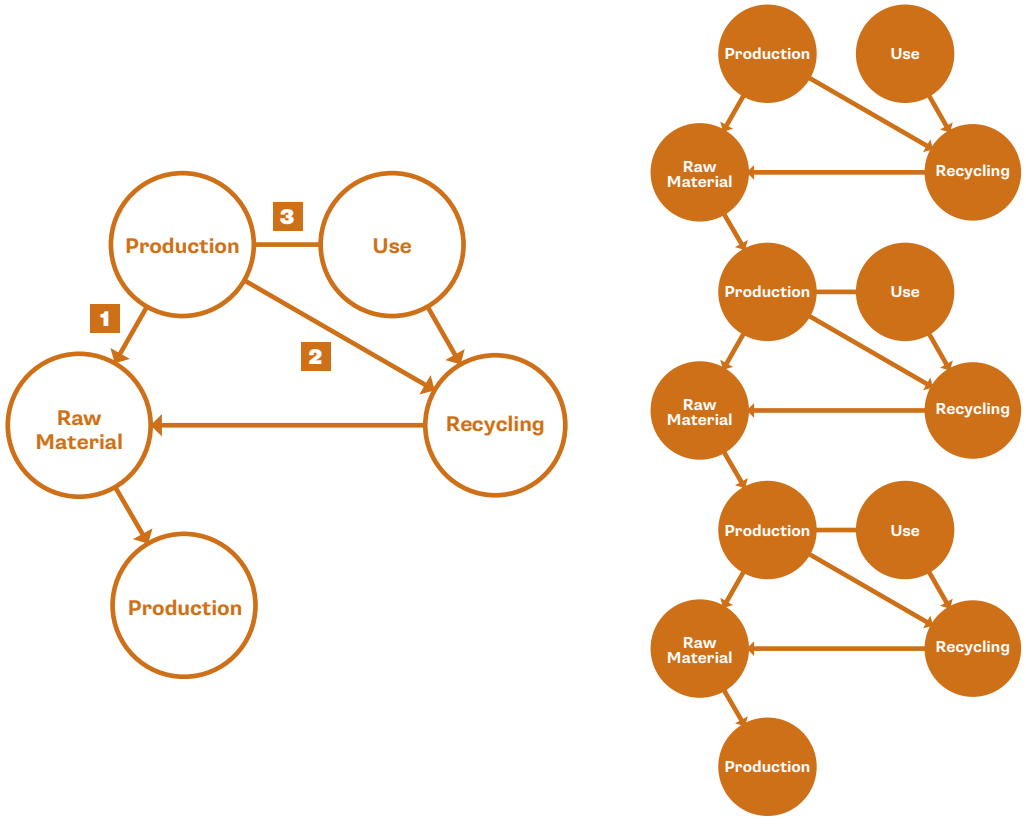


FIG. 5 Three situations of industrial rejects/waste recovery. Source: Elaborated by the author.

According to the criteria proposed for ecodesign in Summary **TABLE 3**, the applicability for producing aluminum packaging can be analyzed.

» **REDUCTION AT THE SOURCE**: in the last 20 years, aluminum containers have become about 30% thinner. (CEMPRE 2012(B))

This improvement is the result of continuous research on technological solutions, but also a proposal for a more structural geometry, which gave the container stability, even with a finer film;
» **USE OF RENEWABLE RAW MATERIAL**: although it is a non-renewable material, the high power of recyclability, besides technical advantages, ensure that aluminum continues to be a good choice for beverage cans;
» **INCENTIVE TO HOUSEHOLD SORTING**: knowledge about the material is a marked aspect favoring household sorting, since it is intuitive, ie., it is not necesssary to to question its selection;
» **USE OF MONOMATERIAL**: cans are made only from aluminum, which is very favorable for household sorting, since there is no need for any training as to what should be removed from the packaging for collection;
» **OBSERVATION OF CONTAMINATIONS**: since they are monomaterials, possible contaminations from a project were eliminated; contaminations during the collection phase are reduced by the ease of sorting presented by the product;
» **ENHANCEMENT OF THE VALUE OF RECYCLED MATERIAL**: new products that enhance the value of recycled materials are important to add value to the raw material, disseminating the idea and doing away with prejudices. (**FIGURE 6**)

FIG. 6 Example of enhancing the value of recycled material: relaunch of the 1944 Navy Chair uses 80% recycled aluminum. Source: EMECO, 2013.

FINAL CONSIDERATIONS

The importance of packaging is undeniable, despite the large volume produced. Together with its transitory character, the constant increase of garbage generated by it continues to be irs worst environmental problem.

The reduction of environmental impacts caused by packaging must be considered in design, in the life cycle and as to complexity: replacing materials by renewable raw material, reducing the amount of material at the source, prioritizing monomaterials and more intuitive solutions, which will make collection and sorting easier, and seeking project solutions that will enhance the value of recycling.

The purpose of presenting a proposal for criteria on packaging ecodesign connected to its life cycle was to spell out the decision factors in design that will directly imply recycling packaging, taking into account the production, use and post-use phases.

The importance not only of the solutions proposed for the packaging, but also for objects that use recycled packaging materials allowing a better flow and adding value to the recycled raw material is highlighted, as shown in the successful example of the aluminum cans.

ACKNOWLEDGMENTS TO THE RESEARCH DEVELOPMENT AGENCIES CNPQ E FAPEMIG.

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WORKING WITH WASTE TO DIGNIFY HUMAN EXISTENCE THROUGH COLLAGE AS SPONTANEOUS DESIGN

ROBERT HARLAND
MARIA CECILIA LOSCHIAVO DOS SANTOS

In 2008 the Nobel Peace Centre in Oslo provided the venue for a multimedia installation by Magnum photographer Jonas Bendiksen. The exhibition, called *The Places We Live*, evidenced the domestic life for slum dwellers in Nairobi, Kenya; Mumbai, India; Jakarta, Indonesia; and Caracas, Venezuala. In the press release for the exhibition, Bendiksen states *"Over the last three years of visiting slums I'm simply awestruck by people's capacity to create normalcy and dignity out of the most challenging circumstances."* Reporting the exhibition, an article in the UK newspaper *The Guardian* claims that one-third of urban dwellers live in slums worldwide, amounting to one billion people. One of the most prosperous of these, Dharavi in Mumbai, is said to have an annual economic output of approximately $1bn, and keeps "the rest of Mumbai from choking on its own refuse." Bendiksen's "intimate and colourful images" document the four internal walls that define the interior of 20 single room shanty family homes containing everything they own. The accompanying stories speak of 15 people in cramped conditions that fills with gutter and sewage water when it rains; the constant threat of demolition; unreliable electricity supply; gang violence and killing; prostitution; sadness. His photographic images display contrasting levels of wall adornment: a Jakarta dwelling occupied by an abandoned wife, a "little by little" constructed Caracas colonial style room with walls covered in ornamental artfacts in two and three dimensions. One family of five are shown to live in a

room that took two days to build under the Gedong Panjang bridge in Kampung Miskin, Jakarta. The interior is entirely covered in white material containing a regular pattern featuring not floral or geometric images but the Dunlop logotype. This is supplemented by other stickers showing the logotype of the electrical goods manufacture Siemens. These came from a scavenger who obtained them from a printer. Asanah, the wife, lives in constant fear of flooding and the bridge collapsing. Inspite of this, she confesses to liking to "keep things neat". Part of her sense of normalcy and dignity is seemingly represented by the corporate collage that covers the walls of her family abode.

Collage in this sense is interpreted formally as the technique of *"pasted paper"* incorporated in a picture, though it also has an anthropological slant categorising the *"discarded, the unwanted, the overlooked"* (TAYLOR, 2004, 8). In general terms, it means a combination of different things: objects may be *"collaged together"* (TAYLOR, 2004, 125). In his project, Bendiksen brings to our attention to human activity that is perhaps better described as *"assemblage"* as practiced by the urban poor. This contrasts the way trash, garbage, rubbish, dross or detritus is documented by Whiteley (2011) within art and politics. There, the ideological, social, political context and associations beyond art are acknowledged (WHITELEY, 2011, 5) but more as an economic than aesthetic need. *"Art's use of trash"* is never a matter of survival in the way the urban poor depend on it. Bendiksen's images better illustrate the contiuum between survival and self-actualisation as aspects of human need and an unacknowledged form of what Whiteley calls *"culturalist bricolage and garbology"* (2011, P. 1). The urban poor are less conscious about *"the art of assemblage"* and the abnormal, and more aligned with assemblage as a design strategy, survival process and representation of normality. Their actions are unrehearsed in that they are preoccupied with subsistance and sustainability. Any appearance of spontanaeity — a term associated with assemblage associated with *California Collage* (TAYLOR, 2004, 120) — is genuine and the design of habitat may more aptly define their art of assemblage.

Depending on your understanding of the term design, there could be something of a contradiction in the combination of the words 'spontaneous' and 'design'. Is design not about organisation and planning? And yet to do something spontaneously is to act on impulse, of one's own free will, or in an unpremeditated way. However, we know that design means more than organisation and planning. Something that has the appearance of spontaneity can be a façade for a carefully constructed sequence of actions and intentions. Design has different meanings, summed up by the phrase *"design is to design a design to produce a design"* (HESKETT, 2002, 5). Here, its meaning changes

from noun to verb and back again in less than a dozen words. Susan Yelavich humanises the term when she states *"Design is that highly specialized realm of human activity that shapes virtually everything in the world"* (ALBRECHT, LUPTON, AND SKOV HOLT, 2000, P. 9), *"Everyone designs who devises courses of action aimed at changing existing situations into preferred ones"* (SIMON, 1996, P. 111). Donald Schön is more descriptive in stating what a designer does.

> *"A designer makes things. Sometimes he makes the final product; more often, he makes a representation – a plan, program, or image – of an artefact to be constructed by others. He works in particular situations, uses particular materials, and employs a distinctive medium and language. Typically, his making process is complex* (SCHÖN, 1995, P. 78-79).

Here, we are interested in the wider definition of what design is. We are concerned with the products of design, and the different processes and motivations that contribute to the making of 'designs' in a post-consumption context. In the examples of design that follow, the appearance is one of spontaneity, but the design process is both consciously and unconsciously dependent on planning and organisation, as well as a multitude of human traits. The aim is to link knowing and unknowing practitioners who design using collage as a medium for survival and self-expression, sometimes both. In doing so, we will demonstrate that collage and assemblage, as a 'method' of image making can be considered as a universal and democratic medium that serves many useful, if functions beyond the professional context. It therefore has the potential to offer a particular view of the world, uniting the plight of the rich and poor through the appropriation of a recycled visual language through '*bricolage*' and a '*do it yourself*' (DIY) logic.

A DIY LOGIC

According to Lévi-Strauss, '*the bricoleur*' is adept at performing a large number of tasks; but, unlike the engineer, he does not subordinate each of them to the availability of raw materials and tools conceived and procured for the purpose of the project. His universe of instruments is closed, and the rules of his game are always to make do with *"whatever is at hand"* (LÉVI-STRAUSS, 1966, P. 17). Reviewing the importance of Lévi-Strauss, Christopher Johnson states

> *"Lévi-Strauss (...) describes such representation as a 'logic of the concrete' or bricolage, a kind of DIY logic which takes items ready-to-hand in the natural world and processes them into units of opposition, constructing higher-order systems of signification in the same way that a language constructs meaning from different sound utterances"* (SIMONS, 2002, P. 234).

This DIY logic reveals itself time and again as a medium that in developed countries has been elevated to an art form, but in developing countries is a means of survival. In this sense collage is both a conscious and unconscious visual language that is representative of both urban poverty and urban prosperity. As a representation of urban poverty it manifests in the economic, social and culturally deprived neighbourhoods of our built environments, as an environmental response to a problem in the environment. As a representation of urban prosperity it manifests in the economic, social and culturally privileged neighbourhoods of our built environments, as ornamentation and embellishment, enriching the already very rich. And yet, poverty and prosperity are linked by a shared aesthetic created by the shared human traits of the collector, the image-maker, the homebuilder, and the designer. At its most vivid, this aspect of design can be identified by contrast between those who 'have' and those who 'have not'.

TO SYNTHESIZE AND SYMBOLISE

This paper examines the potential that unconscious design, particularly graphic design, has to reveal, represent and contribute to alleviating social and environmental problems in the urban areas of São Paulo in Brazil. What we have known as graphic design is traditionally associated with the commercial and industrial context out of which the subject developed in the early Twentieth Century (HARLAND, 2007). However, the benefits of this association are rarely acknowledged and yet have significant social and cultural impact. In developed countries, a flourishing industrial and commercial context contributes significantly to economic wellbeing. This brings many health care and educational benefits to the population (LEARNING TO SUCCEED. REPORT OF THE PAUL HAMLYN FOUNDATION, NATIONAL COMMISSION ON EDUCATION (1993, P. 13). But, some countries have not been so fortunate in harnessing and developing these benefits. One such country is Brazil. Despite being the fifth largest country in the world, in size and population, and the world's fourteenth largest economy, the country

has significant social and economic inequalities (LOSCHIAVO DOS SANTOS, 2007). These inequalities result in the 'economic exclusion' of minority communities, often living in urban poverty.

Ironically, graphic design is present in this context of inequality, evident in the vast range of discarded ephemera. Product design is also present and together, as 'ephemera', they synthesize and symbolise a survival strategy for deprived people. Reconstitution inspires the urban poor to scratch a living by collecting from the streets for recycle, resale, and sometimes, in the creation of a spontaneous design through its re-use as bricolage. *"Spontaneous design is a creative practice of finding working solutions applicable to solve concrete problems, in a context of severe lack of resources"* (LOSCHIAVO DOS SANTOS, 2000). The practice of such spontaneous design by the urban poor conveys a tremendous sense of creativity and design that transforms objects of low culture into survival and life protection. Imprinted materials are stretched on the ground, and they become insulation between the body and the cold concrete sidewalk exemplifying a compulsory reuse needed by all types of human life survival and shelter.

THE URBAN POOR IN SÃO PAULO

Walking through the neighbourhoods of any major Brazilian city one comes across a range of communities living on the margins and in favelas. It is a distinctly urban phenomenon that demonstrates the survival skills of a huge number of people under the poverty line. Despite their situation and marginality, this population undertakes an impressive contribution to the process of recycle and re-use of the urban solid waste in Brazilian cities, as well as re-thinking design, displacement, nomadic housing strategies, culture and the aesthetics of urban environments. A significant number of this population live on the streets, where they develop their survival repertoire that involves material collection and recycling, what is known as *'catação'*. It is a self-created economy that reuses the trash and leftovers of the city. Recyclable material collecting sometimes reaches or surpasses the minimum wage. This phenomenon conveys a significant relationship between poverty and waste, as a parallel and informal economy.

Generally speaking, there is a trend that identifies waste as something with value that has been exhausted. However, the encounter of waste in the domain of art or in the survivalist context of the collectors and homeless people

leads to acknowledge that much of what we discard continues to have value. The experiences analysed in this paper provide us with a better understanding of the transformation/redemption of the detritus.

COMMUNICATING POVERTY

This ephemeral aesthetic represents the plight of the urban poor in the cities of Brazil, and across the world. We ruminate on the potential of the recycled aesthetic as the rightful visual language of the *'trash excavator'* and of the cardboard and recyclable material collector, or *'catador'*. The participation of the collectors and the homeless community create their own ephemeral aesthetic, leaving a mark on the urban landscape as a representation of survival, unconsciously sending a message to the world, through visual communication, with a very different sense of purpose to those who use collage as an art form.

But beyond the functional logic of ephemera and packaging, there is another logic that emerges through this unusual use by the homeless and collectors in São Paulo, and in some of the main globalized metropolises. Materials and packaging, in skilled hands and with the ingeniousness of the homeless and collectors, seeking shelter and self-protection, change to become a new material culture constructed from discards of the consumer society. Defunctionalized and abandoned, the degraded objects are present on the city streets as the refuse of industrialized technological culture, publicly exposing the contradictory relations between technology, society, arbitrary needs, cumulative choices in our time, and urban poverty.

The ceaseless search for material survival strategies bring the homeless and the collector the possibility of exhuming these dead products and materials, assigning other meanings to them, establishing new relations and, above all, building a new materiality. When salvaging these products, based on their own criteria of selectivity, creativity and improvisation, the homeless person reveals his personal preferences and idiosyncrasies, in a context where alternative choices are reduced. These wandering objects attract the look of the homeless person, who, by processes similar to those used in archaeology, begins to scavenge the city in a sort of collecting *"urban excavation"*.

These practices of re-use are very close to the spontaneity of Brazilian everyday life and popular art, constituting the potential for a creative and anonymous project that is yet to be fully documented. Lina Bo Bardi recorded

aspects of this heritage in the exhibition *The Hand of the Brazilian People* held at MASP – São Paulo Museum of Art – in 1969, but her exhibition did not deal directly with the anonymous art of the homeless, rather it was about Brazilian popular art, emphasizing that the precariousness of resources act as an element that triggers imagination, fantasy and creativity.

In this situation of material reuse, the borders have become fluid. The materials used by the homeless to take shelter – textiles, plastics, bricks, stone, steel, aluminium, wood, paper, once they have been exhumed from their intended use, have several lives. In the list of materials, cardboard is outstanding (as it was in the origination of collage in Picasso's *The Dream* in 1908). Cardboard is what the homeless "wrap themselves" in, and by "wrapping" build their habitat: the paper city.

Printed materials are laid on the ground and become insulation between the human body and the cold concrete sidewalks, as an example of compulsory reuse, accompanied by all kinds of difficulties for maintenance and personal hygiene. Although dead in the consumer circuit, the objects and materials begin a new trajectory at the hands of the homeless, who show them publicly in the paper condominiums in the heart of 'scenographic' cities, under the spectacular effects of light, sounds and mirrors which have been engendered by modern architectural technology.

It is important to zoom in on this aesthetical aspect of deprived creativity, since there is stereotypical thinking that insists on revealing only the sombre, ugly underworld – with unpleasant odours and excrement – generating distorted conceptions about these individuals. According to the sociologist José de Souza Martins (2008):

> *"The political and charitable discourse about street people is poor in content, because it neglects the imaginative competency of poor people. Therefore we face a contradiction that creates an abyss between a poor person who has a rich imagination, and those who say they are helping him, people who are comparatively rich, and are poor in imagination about poverty."*

What are the consequences of recognising this aesthetic of the discarded in the urban environment? This phenomenon raises some perspectives related to the cycle of use-abandonment-disposal and the necessity of recycling and re-use in other ways. It has to do with the transformation of the status of the material. Looking at the streets and the makeshift habitats by the homeless allows us the opportunity to understand this aesthetic phenomenon from

everyday urban life, going far beyond the classical interpretation of aesthetics. Commenting on the inheritance of the first group of French professors – Lévi-Strauss, Jean Maugüé, Roger Bastide – who taught Aesthetics at the Philosophy Department of the University of Sao Paulo, the philosopher Gilda de Mello e Souza (1919-2005) developed the concept of the 'rich aesthetic and the poor aesthetic' (*'estética pobre e estética rica'*), which is crucial to the understanding of the ephemeral aesthetic of spontaneous design on the streets of São Paulo.

According to Souza, in opposition to the Aesthetics of Classicism of Jean Maugüé and Lévi-Strauss, the analysis of Roger Bastide focused on another concept of art.

> *"[...] His aesthetics is the aesthetics of an anthropologist, the scholar of the phenomenon of religious mysticism. [...] So, it was natural that arriving in a country without a big cultural tradition, he concentrated on this elaboration of the "poor aesthetic". [...] an aesthetic that elevated this pheno-menon of daily life from insignificance to consequential, compounding the fabric of our life. Finally, it is an aesthetic that is not concerned with being a work of art – much less so a master pieces - it reveals magical qualities, one of the most valid and elevated forms of knowledge."* (SOUZA, 1980, 34)

AN EPHEMERAL AESTHETIC

What exactly do we mean by 'an ephemeral aesthetic'? To describe something as 'ephemeral' often means that an object, e.g. printed matter, has little or no value due to the fact that it is intended to have a short-lived existence. And yet, some people find much pleasure and enjoyment in such objects, and these can often acquire a value well beyond the original cost, for example, hand-written letters by individuals who go on to achieve fame. According to Robert Kronenburg

> *"an accurate definition of the ephemeral is that which lasts for just one day – more commonly we think of ephemeral experiences as transitory ones, though of indeterminate length. It is almost automatic to assume that such fleeting experiences are relatively inconsequential. However, though they may be temporary in duration, their impact can be lasting: the fleeting memory from childhood may become an individual's*

most potent recollection and its power such that it helps focus, or destroy, an entire life. It is therefore the power of the experience rather than its duration that is more important in gauging it's meaning and effect" (1998, P. 7).

The *Ephemera Society*, founded in London in 1975, lists on its website a range of items it considers ephemeral: *"leaflets, handbills, tickets, trade cards, programmes and playbills, printed tins and packaging, advertising inserts, posters, newspapers and much more"* (WWW.EPHEMERA-SOCIETY.ORG.UK). Maurice Rickards, the society's founder, describes these items as 'the minor transient documents of everyday life'. However, the society is careful to exclude from their definition objects such as uniform buttons, on the basis that these sorts of objects are likely to be lasting. To be specific, the society's members are interested in the ephemera of certain trades or professions, whilst others wish to focus on history from a social or graphic perspective. It is of significance to this paper that such members are described as *'collectors'*, and that there is a social and graphic perspective that fuels their interest.

An ephemeral aesthetic can therefore be taken to mean something that is perceived to be of value, or of artistic merit, but composed from items that might be described as ephemera, though we do not discount lasting objects. As a collection of objects, such as a set of postcards or postage stamps, the appearance might be consistent in terms of typestyle, colour or use of imagery, due to the design being done by the same individual or group. Alternatively, the relationship between a random set of objects can be reinforced by juxtaposition. This is often described as a 'collage' of elements, and as a method for composing images this has been used in European Art since the early Twentieth Century in the work of Braque and Picasso as early as 1906 or 1907 (TAYLOR 2004, 11).

APPRECIATING COLLAGE AS A MEDIUM FOR EXPRESSION

The *Chambers Twentieth Century Dictionary* (1983) describes collage as *"a picture made from scraps of paper and other odds and ends pasted out: any work put together from assembled fragments"*. More specifically, the *Compact Oxford English Dictionary* (2003) refers to a *"form of art in which*

various materials are arranged and stuck to a backing" and *"a combination or collection of various things"*. Clearly the term can be applied broadly, and has been adopted by the art world. The term is particularly associated with the Pop Art movement of the 1960s, perhaps the most famous example being Peter Blake's cover design for The Beatles' *Sgt. Pepper's Lonely Hearts Club Band* album cover (1967).

This *"assemblage"* contained a mix of life-size images of some well-known people such as Marilyn Monroe; wax works models of the Beatles themselves, as well as themselves as real people; plants and a floral display that portrayed the name of the group in red flowers. In the exhibition catalogue for *About Collage*, an exhibition curated by Blake at the Tate Gallery, Liverpool (2000-2001), he talks about collage artists such as those involved in Cubism in the early Twentieth Century, American exponents of the 'technique' such as Jasper Johns, Robert Rauchenberg, and Ellsworth Kelly, as well as British educated artists David Hockney and RB Kitaj. Blake assembled an exhibition that Lewis Biggs, Director of Tate Liverpool, suggested *"reveals the radical and far reaching impact of collage on the development of twentieth century art"* and *"also uncovers the human, irrepressible impulse to gather, fuse, and fix"* (2000, P. 9). This last remark could be said of the urban poor.

Although Picasso and Braque are credited as turning collage into an artform, stylistically collage was widespread in the last two decades of the nineteenth century through mechanical reproduction and the development of chromolithography in printing, (MEGGS, 2006, 155-157). It featured work by highly skilled commercial artists working with illustration and lettering. It was not until 1912 that Picasso and Braque suggested in their work a tactile approach to collage – more reminiscent of what we identify with today – with the introduction of paper collage elements into their work (MEGGS, 2006, 249). This included 'words' and 'letterforms' from newspapers to enhance meaning. Very quickly after this the Suprematist Kazimir Malevich developed compositions in oil and collage (JUBERT, 2006, 165), and in the 1920s, artists such as Kurt Schwitters made entire compositions using found material from the streets combining torn paper, often showing dismembered letterforms (**FIGURE 7**). Since then composite images and objects continue to thrive as an artform a century later since its inception.

COLLAGE AS A REPRESENTATION OF HUMAN NEED: FUNCTIONALITY AND CREATIVITY

When we talk about collage as visual language that is representative of both urban poverty and urban prosperity, what do we mean? Poverty and prosperity exist at opposite ends of the spectrum when it comes to human need. To 'prosper' means to succeed (often financially) or flourish, and perhaps to have all of your needs met. Whereas 'poverty' is to be without money, to experience scarcity, and be in-need.

Collage is tangible and representative of human need, and we are able to judge the degree of poverty and prosperity through a value system that is derived from our own respective cultural experience. It is representative in that in different contexts the meanings associated with the juxtaposition of ephemera is audience specific and dependent on cultural understanding. It is tangible in the sense that it is part of material culture that has qualities beyond the purely visual, and is multi-sensorial. But what do we know about human need and how might the context within which collage is used relate to this?

In his book *Urban Design: the American Experience*, Jon Lang refers to a number of models that attempt to generalize and categorize human needs (1996, 151-167). These models, by Leighton (1959), Cantril (1965), Steele (1973) Cross (1977) and Maslow (1987), consider aspects of human concern, sentiment and motivation, and fall into two distinct sets: basic and cognitive needs. Leighton suggests that on a basic level we strive for *'physical security'*, *'sexual satisfaction'*, *'orientation in society'*, *'securing of love'* and *'recognition'*. Similarly, Cantril identifies *'survival'*, *'security'*, *'order'*, *'identity'*, and a *'capacity for choice and freedom'*. Steel also lists *'shelter and security'*, as well as *'social contact'*, *'symbolic identification'*, *'growth'* and *'pleasure'* (the last two being both basic and cognitive needs). Gross talks about *'belonging'* and *'participation'*, *'affection'*, *'status'*, *'respect'*, *'power'* and *'self-fulfilment'*, with *'creativity'* and *'beauty'* considered cognitive needs. Building on this, Maslow refers to *'survival'*, *'safety and security'*, *'belonging'*, *'esteem'* and *'self-actualisation'* as well as a second set of *'cognitive'* and *'aesthetic'* needs. These are essentially a mix of low- and high-order needs, depicted in Maslow's Hierarchy of Needs and illustrated in the form of a pyramid. Attempting to relate this model to design, Lidwell, Holden and Butler (**FIGURE 11**) (2003, P. 106-107) have reinterpreted Maslow's terminology in order to make the model accessible to design activity.

Lidwell, et al state
"the hierarchy of needs principle specifies that a design must serve the low-level needs (e.g., it must function), before the higher-level needs, such as creativity, can begin to be addressed. Good designs follow the hierarchy of needs principle (...)" (P. 106).

They go on to demonstrate this using the example of a video recorder that must be functional, reliable, usable, proficient, and creative, (in the sense that assuming all other needs have been met by the design, it is possible to use the video recorder in ways that go beyond the intended common use.

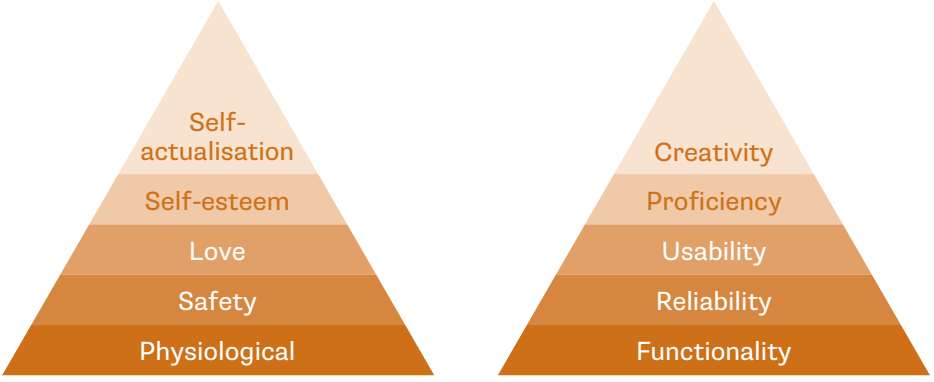

FIG. 4 Left: Maslow's Hierarchy of Needs. Right: Design's Hierarchy of Needs (LIDWELL, HOLDEN and BUTLER, 2003)

COLLAGE AS A MEANS OF SATISFYING LOW- AND HIGH-ORDER NEEDS

If we compare two applications of collage, we see how poverty and prosperity is represented, and how graphic design acts are employed, consciously and unconsciously, to satisfy low- and high- order human needs. On one hand the technique is employed as a structural element that is part of shelter (**FIGURE 12**) that house 'homeless' people on the streets.

This example makes use of a mixture of typographic, photographic, illustrative, and diagrammatic ephemera that although having a random appearance utilises 'graphic' elements that appear to be carefully positioned, revealing as much content as possible. Familiar icons that have mass appeal, such as *Disney*'s *Mickey Mouse*, can emerge from the collection, which has the appearance of ephemeral wallpaper with an ephemeral aesthetic, but is imbued with the occupant's own sense of meaning. It is both functional and 'creative', though probably satisfying a need to protect oneself from external elements, rather than as an innovative design solution. Primarily it fulfils a physiological and functional need.

FINAL CONSIDERATIONS

In this paper we have attempted to draw a link between the poor and the prosperous urban dweller, through the medium of collage, as a means of survival, and self-expression. In doing so we have tried to illustrate the plight of the urban poor, who suffer from social exclusion. Exclusion, and inclusion, in this context is a social phenomenon, and according to Madanipour, Cars and Allen, this is manifested in three critical dimensions: the *'economic, political and cultural arenas'* (LEGATES AND STOUT, 1998, 2003, 181-188). The urban poor we speak of here are denied access to economic and political stability, but in the cultural arena, where they can share a set of symbols and meanings, the *'trash collector'* can build an individual and collective identity, one that is ironically shared with their more affluent counterparts. Despite economic and political exclusion, culture offers a lifeline to the less fortunate, in that *"(...) visual culture, aesthetics of social behaviour has become an essential part of social life"* (LEGATES AND STOUT, 1998, 2003, 184).

In a seminal manifesto published in 1965, *Aesthetics of Hunger*, the Brazilian filmmaker Glauber Rocha wrote about the main aspect of Latin America condition: *"Economic and political conditioning has led us to philosophical weakness and impotence (...) It is for this reason that the hunger of Latin America is not simply an alarming symptom: it is the essence of our society".* The waste disposal of the haves and its redemption by the havenots evoke this essence of *'latino'* culture, and conveys an alternative aesthetic, which transforms its negative sense thus creating this ephemeral and bricolage aesthetic.

Finally, this paper has also attempted to demonstrate that the act of design, and the resulting ephemeral aesthetic, is a shared human activity employed by rich and poor, both of whom demonstrate a desire to change *an existing situation into a preferred one.* Recognising this might go someway to changing a socially exclusive situation into a more inclusive society.

ACKNOWLEDGMENTS TO THE NATIONAL MOVEMENT OF RECYCLABLE MATERIAL COLLECTORS AND THE HOMELESS COMMUNITY OF SÃO PAULO. THEY SHARED INVALUABLE INFORMATION AND GAVE ENCOURAGEMENT.

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SOLID WASTE PREVENTION AND THE SUSTAINABILITY CHALLENGE

SYLMARA LOPES FRANCELINO GONÇALVES DIAS
ANA PAULA BORTOLETO

The importance of the debate on SW prevention has been growing, both in the academy and in the public and private sectors. According to the OECD (2011), in most countries for which data are available, the increasing economic affluence of the population, associated with the changes in the patterns of consumption is responsible for the continuous per capita excess of SW.

The contemporary appetite for resources and energy is growing implacably, showing the negative environmental impact of the products and transforming their SW into a great environmental challenge for urban life. In uncontrollable proportions, production, consumption and discarding of products have been dominated by the reproduction of the number of versions and flavors at the public's disposal. *"One thing is certain: the current economic development model requires an ever increasing amount of natural resources"* (PENGUE, 2008). In a world in which these resources are limited, there is no solution for a model that is based on the idea of infinite and unlimited progress. The fact is that humankind is exhausting the natural resources at a greater speed that the Earth's natural capacity for regeneration. In response to this scenario, the European Union adopted a strategic policy for SW management based on three pillars: prevention, recycling and reduced final disposal.

In Brazil, the enactment of Federal Law nº 12,305/2010, which instituted the National Policy of Solid Wastes [*PNRS*], gave Brazilian society a regulatory

instrument that requires full participation of society and of the actors directly involved in detailing the procedures and mechanisms to implement the policy, especially as regards the post-consumption wastes. However, as regards waste prevention, the law also includes concepts, guidelines and highly generic conditions.

Programs for SW prevention at the source are part of the product policy, both in production processes and consumption. The current problem arises in this context: which aspects of the concept of SW prevention are present in the PNRS? What are the restrictive and driving factors for their effective implementation in the Brazilian context?

In order to answer these problems, this chapter attempts to analyze the aspects of SW prevention present in the PNRS, studying the contribution of experiences of programs implemented in the European Union, for clear proposals of strategies and practices within the scope of the PNRS. With experiences and parameters that are being used in other countries, especially in the European Community, in order to insert SW prevention into the production-consumption chain, the analysis of SW prevention experiences can contribute to elaborating programs and mechanisms (for instance product labeling and educational programs) appropriate to the Brazilian context.

WHAT IS REALLY THE PREVENTION OF SOLID WASTES ?

The purpose of preventing SW is to reduce the negative impacts of materials on human health and on the environment, before they enter the SW flow, and this can be done according to three lines of action: strict prevention, prevention at the source and reuse of the good (OECD, 2000).

The potential scope of prevention is very broad, both sectorially and territorially, and the concept of "SW prevention", sometimes aims at a variability of areas and spectrum of action that really must be clarified. The study performed on European programs by Saintmard (2006) reveals that the concept of prevention must be clarified and distinguished from the concept of SW minimization (in the sense of reducing the quantities of SW that need to be eliminated). **FIGURE 1** shows the scope of waste prevention.

It should be highlighted that the potential contribution of prevention to the minimization of SW in general, has never been perceived in a significant

manner. Although SW prevention will never render recycling obsolete, using both will generally have a greater influence on the overall reduction of SW than applying exclusively one or the other. Therefore it is necessary to understand the interconnections and differences between the SW prevention and recycling policies.

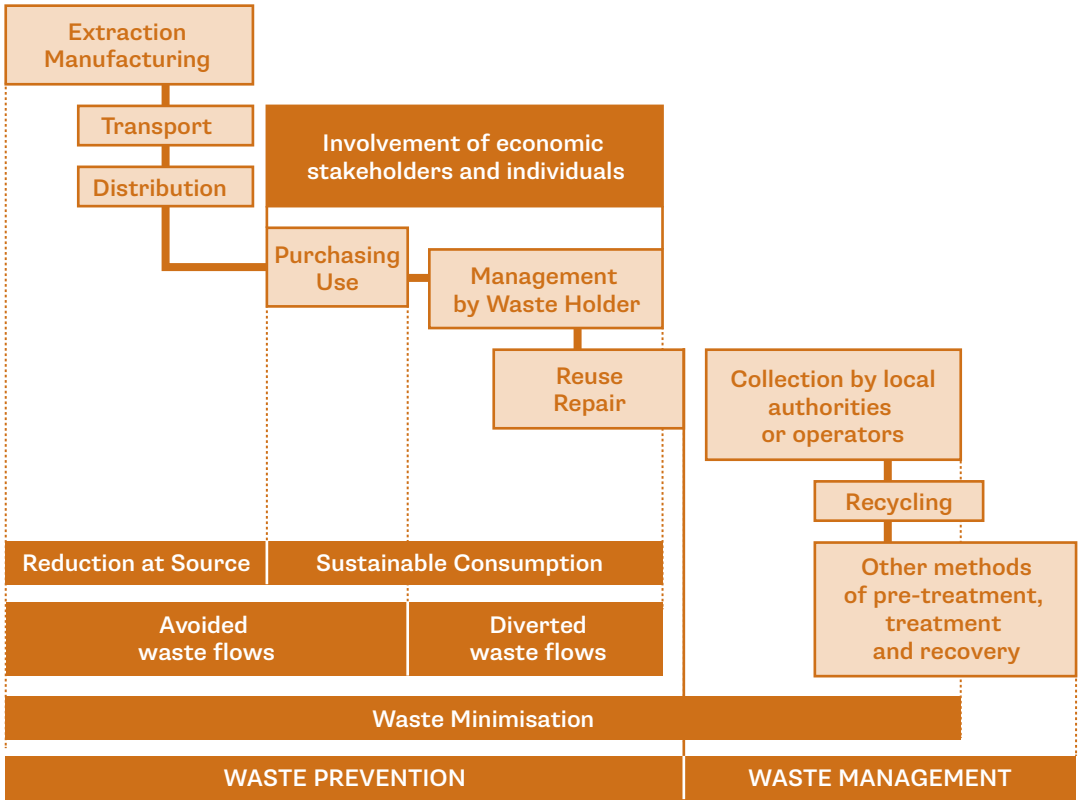

FIG. 1 SW prevention actions in the context of the life cycle.
Source: European Commission, 2012, p. 7.

In order to analyze the scope of SW prevention, this section covers a few important specific issues: the relationship between prevention, reuse and a possible trade-off between qualitative and quantitative prevention, and the borderline between recycling and prevention. It also covers a possible taxonomy for SW prevention activities.

Prevention includes measures taken before a substance, material or product becomes waste. These measures include:

(A) Reduction of the quantity of SW, namely, by reusing products or lengthening product life;
(B) Reduction of the negative impacts of SW generated on the environment and on human health;
(C) Reduction of the content of harmful substances in materials and products.

This can, however, be condensed into two main aspects: prevention of SW generation (quantitative prevention) and prevention of damage by SW elimination (damage prevention).

Reusing is a new form of SW prevention, on two different levels. First, reuse temporarily prevents a material or product from going into the SW phase, especially if we think about a market for preparing and reconditioning products. The production of new products (that ultimately become SW), is put off and diminished.

On the other hand, reuse can have perverse effect when combined with export to countries that are not OECD members. Reusing, or using as second-hand, especially when exported to countries that are not members of the OECD, should be evaluated taking into account the estimated remaining work life and the intended disposal of the product when it finally enters the SW phase. But the same argument goes for the export of just recently produced low quality products. Qualitative prevention can be the key to the solution regarding the issue of reuse in countries that are not OECD members, with limited capacities to provide treatment. It is necessary to evaluate the life cycle in order to appreciate the environmental benefits and the usefulness of reutilizing products in contexts of a given economic and technological situation.

SW recycling and prevention are connected but require a different approach. Recycling focuses on the treatment of a product when it has already entered the SW phase, and when it is not in a condition to be reused. Prevention requires decision, measures and policies different from recycling or recovery of materials. The recycling project is not synonymous with a longevity project. It is, thus, important to make the different stage of the SW treatment hierarchy clear and distinct.

However a colateral effect of recycling is quantitative prevention. Recycling automatically leads to the prevention of SW in the extraction of natural resources and reduced landfill or incineration, but it does not prevent pre or post-consumption SW.

SOLID WASTE PREVENTION STRATEGIES

SW prevention strategies available to the European Union Member-States, are divided into three large categories, which means different levels of government involvement:

(i) INFORMATION STRATEGIES: SW prevention depends on broad changes of attitudes and behaviors which, obviously, cannot only be legislated, but must rather be stimulated by means of successive measures. The first category is thus concentrated on sensitizationn, by means of strategies providing information to the public in general and to businesses. Further details in Summary **TABLE 1.**

(ii) PROMOTIONAL STRATEGIES: They stimulate knowledge and community awareness for SW prevention, on taking specific measures and providing financial and logistic support to make this process easier. Promotional strategies, encouraging changes in behavior and supplying logistic and financial support for beneficial initiatives are further detailed in Summary **TABLE 1.**

(iii) REGULATORY STRATEGIES: They impose limits on the generation of SW, expanding environmental obligations and the imposition of environmental criteria in the public contracts, as per summary **TABLE 1.**

These strategies are complementary and can be integrated into other areas of current policies, such as the SW management policy, sustainable production and consumption policy, environmental policy, or they may constitute an independent national SW prevention program. If economic instruments are well designed and accompanied by complementary measures, they may provide an effective contribution to SW prevention and should be taken into account.

An integrated set of measures is required for a substantial approach to the SW problem, and to provoke changes in the way the resources are managed. The particular challenge for political integration and coherence in the context of SW prevention plans is that the different dimensions of integration (i.e., horizontal, vertical and integration thoughout the life cycle) should be considered at the same time. Therefore, in parallel with the opportunities to create synergies and improve political coherence, there will always be several tradeoffs to be taken into account. In particular, the prevention of SW should be part of an integrated reflection, leading to the convergence of waste management and contributing to obeying the hierarchy of SW management and treatment, as proposed by the European Commission (2012), and reproduced in **FIGURE 5.**

INFORMATIVE STRATEGIES

Strategies	Description	Examples
Sensitization campaigns	A first step is to call attention to SW prevention. It is essential to stimulate behavioral change; Effective sensitization campaigns often concentrate on a given flow of SW and offer a practical guide with advice on SW prevention actions.	Campaigns to use cloth bags (reusable) instead of plastic bags, the use of "no junk mail" adhesives, or the implementation of composting at home. In order to incentivize reuse, for instance, governments should inform the public about the options, installations and existing alternatives for reuse, and the quality of products reused, as well as about practical and logistic aspects. For instance, where to take goods that can be reused, and how to deal with them and store them carefully. Ex. European Week of Waste Prevention, (*www.ewwr.eu*), an initiative involving businesses, schools, local authorities and associations.
Technical information about SW prevention	Supporting sensitization actions, information directed to SW prevention techniques must be made available to specific users, such as companies, industries, families and organizations. The needs of each of these users vary and indicate the adequacy of certain types of advice, tools and resources.	» on-line information portals, practical information about SW prevention techniques. Example: Eunaofaçolixo.com portal (I don't make trash) (http://www.eunaofacolixo.com/), in Portugal, demonstrates SW prevention techniques in the rooms of a house » On line tools to calculate and accompany data on SW generation and to develop a SW prevention plan. Examples:: WRAP Waste Prevention toolkit, (*www.wrap.org.uk/applications/waste_prevention_toolkit/*), and GreenBusiness.ie in Ireland (*http://greenbusiness.ie/*). » Information Centers to supply practical support via phone lines, on-site visits or business platform. Example, WasteCap (http://www.wastecap.org/) in the USA and B2Blue (*http://www.b2blue.com/*) in Brazil, offer a range of services to help businesses transform SW into resources.
Training programs for the local authorities	A plan must be established to ensure that the different administrative levels of the local	» Prevention Demonstration Program for Local Authorities in Ireland:

»		authorities responsible for implementing the program have appropriate training. They in turn can ensure that the training programs are adequate to involve and make use of the skills of the interested parties.	» WasteCap, training and mentoring program for auditing SW and efficiency of materials in the United States » Ecofit, cleaner production offices, in Austria.
	Environmental label	The environmental labels can help consumers identify the products that will meet environmental criteria, including the packaging efficiency of the materials, the limits of packaging and the hazardous materials, thus providing information about SW prevention, directly to the consumers at the time of purchase.	Example: the EU Ecolabel helps identify products and services that have a smaller environmental impact during their life cycle, from the extraction of raw material until production, use and disposal. (*http://ec.europa.eu/environment/ecolabel/*)
PROMOTIONAL STRATEGIES	**Support for voluntary agreements**	Voluntary commitments of goals to prevent SW are generally for a specific sector. Voluntary environmental actions taken on by the companies are often well disseminated, highly effective to attain the agreed goals, and to increase public awareness of the issue. In the absence of national goals to prevent SW, or in cases in which the sectorial agreements present much more ambitious objectives than the national goals, it is recommended to use incentives, such as funding, promotion activity and logistic support.	Courtauld Commitement is an example of a voluntary agreement for absolute reduction of packaging and the SW of foods. Led jointly by wholesalers and suppliers, it represents 92% of the supermarket sector of the United Kingdom. The initial objective of zero packaging waste has already been achieved.
	Promotion of reuse and repair	Centers for reuse and repair supply an essential service, extending the life of a large range of consumer products, with a significant potential to divert SW from landfills. These centers are often operated by social integration companies that work with groups of underprivileged and unemployed, who are trained in technical repair skills, and thus it also serves a social function.	Organized networks of repair and reuse centers are advisable as part of any SW prevention plans, and they can play an essential role in the local SW management systems run by local, regional or national public authorities. Currently they exist in more than ten EU Member States, with independent facilities or in regional or national networks.
	Promotion of environmental management systems	The environmental management system (*SGA - Sistema de Gestão Ambiental*) is a tool that supplies a structure to evaluate the environmental impact of an organization, and helps increase the efficiency of materials, long term planning and, often, cost reduction. The SGA	The EMAS environmental management systems and the ISO Systems as a key tool in approaching business, packaging, industrial waste and construction and demolition wastes.

PROMOTIONAL STRATEGIES		can be widely promoted at administrative levels. Local authorities may opt to develop or promote tools for simple evaluation for specific sectors.	
	Incentives to clean consumpton	Incentives to clean consumption differ from taxes as economic instruments, motivating waste prevention behavior without imposing a penalty.	The Alameda County, California Entrepreneurial Fund for SW Prevention, for instance, offers to help with expenses up to US$ 100,000 for investments in SW prevention projects.
	Promotion of research and development	The study can help national authorities to identify the priorities and SW prevention programs, offering opportunities to help the main issues and make use of the existing infrastructure. The results of these projects may help local and national authorities, besides the manufacturers decisions to select more integrated and sustainable systems to manage SW.	The EU has supported research projects aiming at developing tools and policies to prevent an dminimize SW in the sphere of teh Technological Research and Development Programs, for a given time period.
ESTRATÉGIAS REGULATÓRIAS	Planning Measures	» Certain SW or substances can be excluded by regulations regarding elimination, which obliges producers to recycle materials or eliminate them, based on production processes. Planning measures include requirements for public announcement regarding pollutants, an increase in the stricter standard for facilities that produce hazardous material or generate hazardous industrial SW. » Requirement of activities to reduce the generation, reuse, prevention and segregation of wastes. They can be demanded as a conditions to provide permission and approval of the license to operate trade and industry. » Systems to pay for what is discarded (Pay-as-you-throw system), with variable rate prices for SW collection, per weight or volume This measure is useful to extend the consumer's responsibility to the products purchased, and to prevent waste. The pay-as-you-throw systems achieved different levels of sucess because one must take into account public opinion, as well as the infrastructure to manage existing urban SW. Usually, they must be	» Taxes and incentives, such as pay as you throw system, taxes on SW, rates and charges can be used to incentivize waste prevention behavior, to incentivize the development and use of environmental management systems that increase materials efficiency. Taxes are mandatory, and do not offer a benefit to the taxpayer, proportional to the value paid. Rates can be charged on specific SW flows, taxes on carbon based packaging in Holland, for instance, or on the final quantities of SW collected, as in a pay-as-you-throw (PAYT) system. Some EU Member-States are promoting the introduction of these systems on a national or regional level. Several examples and success stories are described in a study recently published by the Committee (*http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf*). » Fiscal incentives can be used to promote reuse and repair, exempting reuse and repair centers from taxes, or by applying reduced taxes on the sale of reused products.

	organized by the local authorities, together with society. It is recommended that commissioning or subsidies for research be an important planning measure. PAYT systems must be systematically foreseen in prevention programs, due to their proven efficacy. In systemic, long term thinking. Research and Development on the efficiency of the resources and management of materials flow should support the SW prevention programs.	» Subsidies or incentives that increase the penetration of ecoefficient products on the market are other important measures to be considered.
Extended Producer Responsibility (EPR) Policies	The producers generally do not carry the cost of collection and disposal of their products, after they have reached their end of life, and, therefore, do not have an incentive to ensure that the product components will be easy to repair, reuse or recycle. Broadened producer responsibilities aim at transfering part of the cost of elimination back to the producers, and thus drive the investment in efficiency of material, to reduce the possible amount of SW. Investment in ecodesign is also encourated to extend the life cycle of the materials used. The policies can be specific for certain industries or SW flow systems. The systems that are the responsibility of the packaging manufacturer were established in several EU Member-States. In the United Kingdom, for instance, the manufacturers have to pay packaging recyclers through invoices of SW recovery. In some industries, this policy can be better executed, supranationally, to simplify the requirements for the producers who operated in several countries. EPR policies must link the cost of eliminating a given product waste to the producer responsible for creating it, with collective systems for management and treatment of products subject to EPR,	Several examples and success stories are supplied in European Commission publication (*http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf*).

REGULATORY STRATEGIES	Green public purchasing policies	The government must consider, at any administrative level, the inclusion of SW prevention criteria in its purchases and and contracts, in the sphere of sustainable public purchases. Measures to prevent SW can also include the promotion of green purchasing policies for private businesses.	In order to integrate the green public purchase policies in SW prevention plants, product durability and repair must be emphasized at the time of purchase. The option to buy an agreed percentage of reused materials and products, should also be considered.
	Ecodesign requirements	The governments can select SW flows that are a particular problem, and apply a policy on the offer side, as an ecodesign requirement to increase durability, repair and recycling of products that would otherwise be deposited in landfill.	Finland, for instance, has an ecodesign requirement for electrical and electronic appliances as part of its National Wastes Plan.

SUMMARY TABLE 1 Description and examples of informative, promotional and regulatory stategies to prevent SW. Source: European Commission (2012).

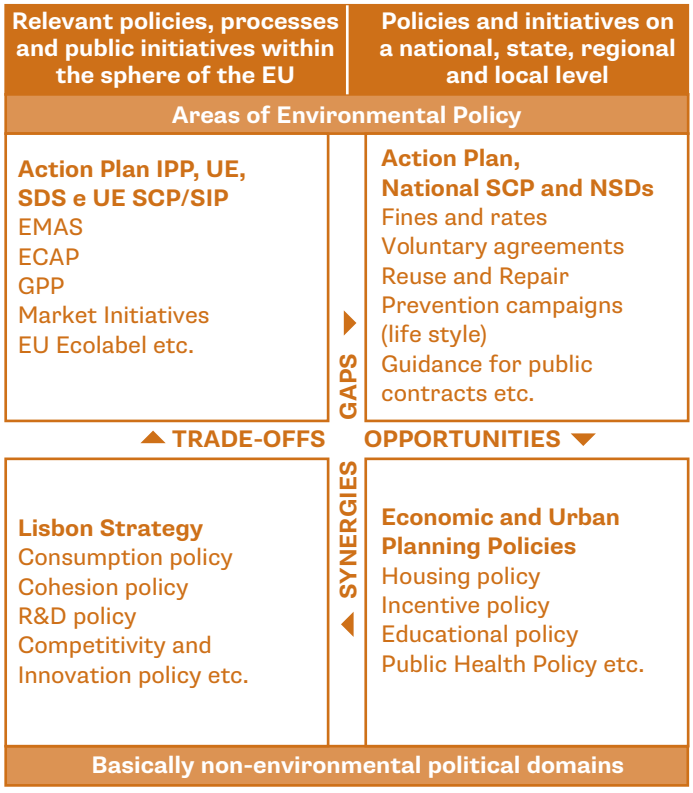

FIG. 5 SW prevention as an area of transversal policy: focusing on gaps, opportunities, synergies and coherence, and also on trade offs during planning to prevent SW. Source: European Commission (2012).

PREVENTION AND THE NATIONAL POLICY OF SOLID WASTES

The idea of prevention is central to any environmental policy and, in a very brief synthesis, concerns the anticipation of negative environmental consequences, ie., action taken prior to them, to avoid them as far as possible. In SW management, prevention is an increasingly important concept. After all it is at the same time a fundamental factor, not only for the management of waste materials, but also to protect natural resources over the medium and long term. In the case of the consumption SW, acting preventively implies looking

at what the waste was before becoming waste, ie., it means thinking about the product (KRÄMER, 2012; ARAGÃO, 1999) and the associated environmental impact throughout its life cycle.

Since the mid-1970s, SW managemnt planning in European countries has included the concern of adopting SW prevention measures. In this sense, art 3 of Directive 75/442/EEC already expressly mentioned prevention, and this priority is found now in article 4 of Directive 2008/98/EC[1]. Since then the SW management plans of each locality in Europe must include measures for prevention.

In the specific case of SW from packaging, Directive 94/62/EC, following the priority of prevention, defined by the Framework Directive on Waste, defines it, more specifically, as the reduction of the quantity and harmfulness of materials and substances used in packaging for the environment, and in the SW of packaging, as well as in the packaging and in the SW of packaging during the production process and in the phases of commercialization, distribution, use and elimination[2], especially through the development of "clean" products and technologies (Art. 4).

Despite European protagonism in acknowledging the importance of prevention, this prescription has been acknowledged as rather vague (SCHINK, 1999), with a rather timid (if not questionable) implementation, despite the concept, at least theoretically, of different instruments – for comand and control, economic and informational – for the prevention of SW and directed at different social actors (producers, consumers, and/or both). Article 29 of Directive 2008/98/EC which charges the Member-States with the duty of elaborating SW prevention programs by December 12, 2013 illustrates the need to handle the issue of SW prevention more specifically. Annex IV of the aforementioned Directive contains a list of examples of SW prevention measures, whose usefulness is to be evaluated by the Member-States when they elaborate their programs.

In Brazil this scenario which contains generalities and is not very applicable (effective) for the postulate of SW prevention, is no different. In the last few years, there have been a few legislative advances regarding the policies on SW treatment in the country, especially when Federal Law (nº 12,305/2010 was enacted, which instituted the PNRS. It is considered the main regulatory framework of the SW problems in Brazil, and introduces

1 In Brazil the (a prior) order of measures to be adopted in SW management- and at whose top is prevention – is established by article 9 of the PNRS.

2 Currently, during the elimination stage, domestic composting and reuse of the products are also encouraged, because this avoids the process of collection and treatment.

a regime of responsibility in Brazil, based on the Polluter Pays principle, like in its art. 1. In the case of the consumption SW, the aforementioned responsiblity consists of imposing a range of obligations (with a variable content), on different economic agents that, directly or indirectly, participate in the production and consumption processes, ie, those who bear some kind of relationshp with the "future wastes" (products). In this sense PNRS imposes integrated management duties concerning SW, on manufacturers, importers, distributors and vendors (private sector or indirect generators), consumers (direct generators) and the government.

Although the PNRS is an extremely important regulatory framework for SW management throughout the country, as regards prevention, the law is still very generic. As already mentioned, art. 9 of the PNRS instituted the so called SW hierarchy, which prioritizes, in this order, non-generation, reduction and reuse, compared to the other solutions for SW. This forecast is reinforced by the enunciation of the principle of prevention in art. 6, paragraph 1 of the PNRS. In more concrete terms, the PNRS presents a few provisions that, although they deal specifically with the prevention of SW, do so generically and abstractly, and still depend very much on other normative acts that make them practical to apply.

The first of them is Art.31, paragraph I, that requires manufacturers, importers, distributors and vendors to invest in the development, manufactu-ring and placement on the market of products

(i) that are appropriate for resuse after use by the consumer, and
(ii) whose manufacture and and use generate the least amount of SW possible.

Secondly, these same subjects are also mandated to disseminate to the consumers information regarding ways to avoid (and also recycle and eliminate the SW associated with their respective products (art.31, para. II). Furthermore, specifically as regards packaging, the PNRS determines that they be manufactured with materials that further reuse (or recycling). First, those who manufacture or supply packaging materials, as well as those who circulate packaging, materials to manufacture packaging or packaged materials, at any stage in the commercial chain, must ensure that the packaging be

(i) limited in volume and weight to the size required to protect the content and sell the product,
(ii) designed in order to be reused, technically feasible and compatible with the product they contain, as well as
(iii) recycled, if reuse is not possible.

Federal Decree nº 7,404/2010, which regulates the PNRS, unfortunately provides no contribution to elucidating these provisions.

More indirectly, another instrument, for the prevention of SW, is the duty imposed on the entrepreneurial sector to structure, implement and render operational what the PNRS called reverse logistics, which consists in returning the SW (or products) post-consumption, and to the final disposal that is environmentally appropriate for them. Insofar as the entrepreneurial sector is made economically responsible for appropriately disposng of the products it manufactures and places on the market, it is thus expected that they will have an incentive to rethink the design of their products with a view to creating products that make less intensive use of materials, and whose use (consumption) does not generate, or generates less (SW), or even, allows reuse, after all, the smaller the amount of SW generated, the less will be the costs of final disposal.

Considering that recently it has become mandatory to have reverse logistics systems for part of the products listed in paragraphs I to VI in art. 33, and other products and packagings in terms of §1º of the same provision[3], although it seems as yet premature to anticipate an evaluation of the preventive potential of these systems, the fact that the discussions involving structuring and implementing them focus exclusively on recycling goals, without any debate on reuse or design of products, together with the preference signalled by adopting the collective model of responsibility, are signs that the Brazilian case is unlikely to attain the ultimate objective of prevention using this instrument.

THE PREVENTION OF SOLID WASTES AND PRODUCTION CHAINS

The prevention of SW may be considered at the various stages of the product life cycle:

(i) conception / design (ecodesign),
(ii) manufacturing (environmental labeling),
(iii) distribution: offer of ecological products,
(iv) purchase/sale: making available information about the products that have less SW, and those that are more environmentally friendly.

[3] Exceptions are pesticide packaging, tires, batteries and lubricant oils, for which, before the PNRS, there was already a mandatory reverse logistics, imposed by law (as in the case of pesticide packaging) or Resolutions of the National Council of the Environemtn – CONAMA (other examples).

(v) using the product (e.g.: eliminating or minimizing the use of disposables).

In SW management, prevention avoids unnecessary collection, as well as treatment and disposal. It offers a significant potential to reduce the SW that was to be placed in landfills, just as it contri-butes to mitigation of its environmental impacts. Consequently, prevention is the integrating part within SW management, where each option is evaluated for the main purpose of optimizing the system, instead of managing it within a pyramidal hierarchy. Prevention also encourages the efficient use of energy in the industrial sector, on acting in all stages of the production process, eliminating the costs of production, just at it reduces demand for raw material (WHITE ET AL, 2001). This allows a better performance and greater efficiency, making these companies more competitive on the market.

On the other hand, it involves the matter of production, where prevention at the source must obey the product policies (ecodesign and environmental labeling). Throughout its text, PNRS deals directly with highly complex topics, referring to design, sustainability and shared responsibility for the product life cycle. However they are presented generically, without a clear demarcation of concepts and techniques, referring to broad topics that go from the phase of project conception, production, consumption to post-consumption disposal. In this sense, dealing with aspects that involve production and commercialization of new products, international technical standards in conflict with the national ones, private companies and sectors that monopolize public services requires an institutional capacity to monitor many production-consumption-disposal chains.

From a structural perspective, upstream from the Brazilian production chains, the socioenvironmental strategies and practices fail. In this sphere, managing SW becomes a complex set of problems considering the production-consumption chain, individual and collective behavior, the characteristics of the SW generated, the socioenvironmental impacts in all phases of the life cycle, the formal and informal actors involved, technology and regulations and public policies.

PREVENTION OF SOLID WASTES AND THE CITIZEN

Every day SW managers make decisions that affect not only the lives of thousands of people, but also have an impact on the environment and on the taxpayers. Many of these decisions are made without any real consideration, in hopes of obtaining results compatible with the needs. This should be considered a field of decision that very much depends on the support of society and needs to align its policies with social aspirations. It is perceived that the legal instruments, knowledge and education in themselves usually do not provoke lasting behavioral changes.

A look at the consumers' behavior shows a complex terrain that is extremely attractive for public policies. People are attracted by material consumption through a variety of routes, some of them functional, others symbolic. They are often locked into unsustainable patterns within a complex mixture of factors, some of them institutional, some social, others psychological (GONÇALVES DIAS, 2009).

SW prevention programs are part of the product policy, both at the level of production and of consumption processes. All the social actors, including product manufacturers, public and private institutions, individuals and communities, can express specific behaviors to prevent SW. The practical value of prevention will be specific and depend on the characteristics of the material, product, SW flow or target public involved (BORTOLETO, 2009).

According to the OECD (2000):

(i) SW prevention is a multifaceted construction and is far from being a homogeneous policy for a single public;

(ii) the preferences of the agents and choices can guide different manifestations of behavior in preventing SW;

(iii) it should be a collective and universal responsibility within the production chain.

Thus the prevention of SW means a change in behavior that cannot be made overnight. The actors should have the possibility of changing their behaviors and oppositions, an opportunity for which will have to be found at each specific locality, by means of communications work and also by monitoring the measures taken.

Individual behavior is the key to understanding the impact of society on the public policies concerning SW and the environment. For different reasons, an individual's behavior may be beyond the reach of public policies – and may or not

be facilitated by the regulating mechanisms, economic incentives, design and labeling of the product, or by the lack of familiarity with this specific behavior.

Although behavior to prevent SW is a pro-environment type of behavior, the difficulties or obstacles to action are specific, since they differ according to the form of the response to the environment. Few fields of study are more challenging and multidisciplinary than the study of this kind of behavior, where relations between the individual and the environment are extremely complex. Generally, studies in this field apply sociological, economic and psychological theories to find out the influencing factors and the structure of SW prevention behavior.

In psychology this behavior has been studied in a context of psychology known as environmental psychology, which analyzes the interconnected relations between human and environmental behavior (AZJEN, 1991; GROB, 1995; WAGNER, 2002). Most researchers in this field (EBREO & VINING, 2001; TANNER & KAST, 2003) agree that the behavior involving SW generation has multiple causes, grouped into two main categories:

(i) internal factors that influence behavior: personal motivation, attitudes, personal capacities, values, perceptions and routines;
(ii) external factors that influence behavior: social norms, contextual and situational factors.

Bortoleto et al, (2012) developed a conceptual model identifying as direct influences on prevention behavior: personal values, knowledge and capacity, and, as indirect influences: subjective norms, attitudes and knowledge of environmental problems. However, Bortoleto et al (2012) also observed that the absence of direct influence of subjective norms is due to the less developed regulatory structure in this activity. The study by Gonçalves Dias (2009) also confirms this hypothesis.

Thus it is necessary to identify these aspects and the complexities of each type of behavior regarding SW to guide the construction of future policies. Three fundamental aspects should be understood:

(i) if and how all agents participate in the current prevention policies;
(ii) subjective interaction between these agents, their consumption and their activities involving SW generation, and
(iii) whether their actions vary over time.

Change of behavior is a major factor for the successful implementation of prevention policies (GONÇALVES DIAS, 2009; BORTOLETO, 2009). However, to be effective, they must give the participants reasons to justify their actions. These reasons should be sufficiently strong to sustain themselves over time, keeping

the participants continuously interested in maintaining their actions. The key to the success of these interventions is the identification of specific factors that influence the behaviors to be maintained or changed (SMEETERS ET AL, 1998). Thus, effective strategies that promote behavioral changes should include understanding these factors, and also the context in which they find themselves.

There are three strategic routes for behavioral change policies (DE YOUNG, 2000; SMEETERS ET AL, 1998):

(i) motivational strategies: focused on awareness -building and environmental education, seeking to influence the intrinsic factors of behavior;
(ii) informational strategies: focusing on information, communication media and direct marketing, that seek to influence by means of reasoning;
(iii) institutional strategies: focusing on direct control of behavior, which they seek to influence by means of punitive instruments or incentive.
Such strategies appeal to internal and external factors of prevention behavior in different ways.

Bortoleto (2009) performed an experimental study in Sao Paulo to validate the conceptual model for SW prevention behavior. The results proved satisfactory when they used the model as a form of intervention to change the prevention behavior of the participants. However, the experiment was performed with volunteers and, consequently, it was not possible to confirm the efficacy of intervention in less committed individuals. Therefore, it is still necessary to explore this intervention technique in individuals less motivated to adopt SW prevention actions.

The topic of SW evokes an ambivalent issue concerning the role of consumption in daily life (GONÇALVES DIAS, 2009; UUSITALO, 2005, BAMBERG, 2003). The need to discuss the topic of consumer behavior arises from the interdependence between actions of environmental protection, production, consumption and disposal. The threat of exhausting natural resources has been a chronic criticism of consumer society. Individual decisions regasrding consumption have an external impact that is not recognized by the consumer, and to which, therefore, they are not sensitive (UUSITALO, 2005). This occurs because the current level of consumption has not been identified as part of the problem by common citizens who often do not associate their own daily consumption, or the elimination of SW, with environmental degradation.

From this perspective, there are few theoretical approaches and actions seeking to reduce consumption, limiting the excess of packaging[4] and ensuring

[4] This is illustrated by art 32 of the PNRS which was discussed in Item 1 above.

less impacts of the production and consumption system. Possibly, by erecting a barrier considered very high, in relation to the action of a common individual, which is abandoned as excessively difficult in a society in which consumption has begun to mediate all social relations and the very notion of identity (SAFATLE, 2005). In current society, reducing consumption means to reduce economic activity and this is a paradox: the more one encourages consumption, the greater the amount of material to be discarded.

The PNRS mentions the need to modify behavior regarding consumption, but relatively little research has been done on this topic in the Brazilian context. Besides, little is really known about the meaning and magnitude to which the internal and external factors that influence behavior are correlated in this context. In this approach, one of the basic premises is that changes of attitude and behavior of the consumers are essential to deal with environmental issues related to SW generation.

The path to sustainability inevitably requires solving the issue of consumption (GONÇALVES DIAS, 2009). Engaging in attempts to change the levels of consumption and behavior, on the other hand, is to think about fundamental aspects of the social world. A great dilemma to be overcome in this scenario is that the reduction of the consumption levels depends on the change in the model of current society, whose medullary base is consumption. It is necessary to have a reduction in consumption that goes beyond the mere substitution of polluting products by ecological ones, with the same or a higher level of consumption. Thus, technological changes must be accompanied by cultural and structural changes.

FINAL CONSIDERATIONS

Concern about the growing generation of SW is present in all cities of the planet. Increased consumption requires preventive actions appropriate to their technological progress. The innovation of materials to manufacture products is another aspect of the problem, since it accompanies the technological evolution at the same rate. Many of these materials come on the market without any idea of what will happen at the end of their life cycle. In this case, it is up to the researchers, with very high financial investments, to find recycling solutions and new treatment processes for the SW produced by these new materials.

The solution of the SW problem through recycling makes it seem that something is being done. The really structural and background problems are not dealt with (GONÇALVES DIAS, 2009; LAYRARGUES, 2002; LEGASPE, 1996), leading to a false image that recycling is like "the miracle of immaculate consumption" (STARR, 1991). But the truth is that the best garbage is the one that has not yet been produced (PENGUE, 2008).

The problem of this traditional view, mostly, is the fact that it does not take the environmental and economic viability of these new processes of collection, recycling and treatment into account, within a perspective of the product life cycle and the complexity of SW management. Besides, the costs are high and difficult to absorb, both by the productive sector and by the citizen-consumer. Thus the first requirement in using new materials to manufacture products is not their recyclable potential, but rather a systemic understanding of their life cycle, taking the guidelines for prevention into account.

Several countries have already adopted preventive measures in their SW management plans. In Brazil, although the PNRS is an extremely important regulatory reference for SW management throughout the country, it presents concepts, guidelines and highly generalized conditions about it, to the extent of questioning the implementation of the priority that it gives to SW prevention.

Despite the implementation of previously cited regulations, the initiatives taken so far do not appear to have had the expected effect on the total amount of SW generated. Conservative measures that do not need a reduction of consumption, may also avoid the generation of 1% to 3% of the total amount of SW (SALHOFER ET AL, 2008). Government actions are not enough to diminish the impact of SW. The production sector also has its share of responsibility. Manufacturers should give priority to preventative actions as a part of the project of any product, since it is at that time that the interface between the environment and the consumer will be designed, enabling the analysis of the impacts at each stage of the item life cycle. (CAPELINI, 2007).

There is a discrepancy between the priority given to SW prevention and the efficiency of prevention activities. In the case of the SW the evaluation of prevention actions is one of the greatest problems for businesses and public authorities. Prevention is an essential and effective strategy in SW management, which can be applied at any phase of the product life cycle involving several actors and processes that generally are not directly connected to SW management.. The difficulty is encountered when trying to relate the evolution of SW generation to the practical actions of prevention, since generation is also linked to other parameters of the production and consumption chain, whose effect cannot be easily identified. Thus it becomes necessary to evaluate and

monitor these prevention activities to ensure efficiency, efficacy and effectiveness of SW management.

Within the sphere of public policies, looking through the behavior of consumers is currently a complex and extremely attractive terrain. People are attracted to material consumption through a large variety of routes, some functional, others symbolic. They are often caught in unsustainable patterns within a complex mixture of factors, some of them institutional, others social, yet others psychological.

In this way, conventional responses are not up to the complexity of consumption behavior, nor do they exaust the possibilities of interventions to bring about behavioral changes. From this, possibly the difficulty arises to give up immediate and individual satisfaction in favor of a common, long term good, as would be required to expand responsible consumption, turned to the collective and marked by socioenvironmental concerns.

Although government initiatives try to operate on environmental fronts within SW management, there are still decisive questions to be asked concerning why there are almost no public policies that focus on practices of consumption and SW prevention. Engaging the population in attempts to change their standard of consumption and their behavior regarding prevention is, therefore, to think about fundamental aspects of SW management. Finally, the implementation of this new policy will require a careful study of factors that influence the behavior of the actors involved, since it interferes and involves different, and often conflictive roles and responsibilities. In brief, the construction of a new perception among the actors, to value waste, presents as one of the keys to solve the problem.

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DESIGN AND RE-USE: FROM WASTE TO REINVENTION

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We live surrounded by objects that from the their inception were meant to be used by a discardable culture, in which obsolescence rules, insofar as the maintenance and expansion of the globalized capitalist economic activity appear to depend on it. The reduction of product life cycles, as a consequence of rapid technological and marketing changes has increasingly led to discarding products. Millions of dollars are spent on logistics, distribution and marketing, with a view to stimulating a constant increase of consumption. (PALHARES, 2003).

Faced with this complex reality, in which desires of consumption combine with advertising strategies that are apparently disconnected from any sincere concern with the availability of natural resources for the growing production of objects, the question arises as to the role and place of design, operating besides operating according to the logic of catering to wishes, without reflecting rationally on what this logic implies in environmental terms.

It is a given that the solution to environmental problems goes beyond the isolated actions of any specific field of knowledge, however, even on a limited scale, design may contribute creatively, intelligently and consciously to the construction of new relationships between concept, production and consumption, based on more sustainable parameters that do not follow the standards of programmed obsolescence that still prevails at this time.

A specific field in which the intervention of design may contribute significantly to minimizing harmful environmental effects concerns packaging from a perspective that ranges from small scale to a global scale, bearing in mind its generalized omnipresent use, which is inherent to each and every act of consumption.

The need to equate the destination of packaging and of the materials it is made of, after their original use and their final disposal has grown in the last decades (GONÇALVES-DIAS, 2006; SANTOS, 2003; ZIKMUND, STANTON, 1971). Since the 1980s the search for alternatives in order to reduce the quantity of garbage has expanded as a growing concern regarding the destination of packaging after consumption (AMADEU ET AL, 2005; BERTHIER, 2003; PIETERS, 1991). Actually, packaging has been the main point of discussion of public policies and environmentalist groups seeking a solution for the management of solid urban waste (GONÇALVES-DIAS, 2006).

When we discuss packaging from a broader perspective, we are not simply referring to the container for a product but rather something that represents a company´s environmental philosophy (WASIK, 1996). In this context, environmental matters have achieved a central role in the discourse and work agenda of different segments of society (CALLENBACH ET AL, 1993; COHEN, 2001; HANSEN, SCHRADER, 1997; HART, 2005). Intense debate and theoretical and political controversy have arisen from this scenario.

The main concern of this article is to discuss ways in which, from the adoption of a sustainably based new production and consumption paradigm, packaging acquires new possibilities of use and appropriation after its original use has been accomplished, thereby extending its useful life beyond the predicted length, through metamorphoses, deviations and transformations that considerably increase their conditions of use and especially reuse. According to Raul Cardoso *"in acquiring new uses, beyond the first discard, artefacts gain a survival which is sometimes much longer than the 'useful life' that had been foreseen by the manufacturers"* (CARDOSO, 2012, 159).

In this sense, essentially, the propositions based on packaging metamorphosis though user intervention must be considered. These transform them, subverting their initial purposes and altering their life cycle, thereby going from a discard and obsolescence [production – consumption - discard] logic towards another based on the logic of reincorporation, reuse, recycling [production – consumption – reuse].

LIFE CYCLES AND METAMORPHOSES OF PACKAGING

Packaging may be considered a nomadic polluter. At each stage of is life cycle (raw material extraction, manufacturing, distribution, use and valuing) entry flows (materials and energies) and exit flows (waste, liquid and gaseous emissions) produce negative impacts on the environment (pollution, waste, noxiousness) at different places on the planet (KAZAZIAN, 2005; MANZINI, VEZZOLI, 2002). Identifying these impacts is the preamble to any prevention and improvement of the concept of consumption and post consumption of the packaging. These stages must be analyzed from product inception since each of them hs the potential for environmental optimization: in the choice of raw materials, technologies, and manufacturing processes, in organizing logistics; followed by considering the use and final valuation of the packaging, its future, its end of life and the value that can be assigned upon a possible reintegration to another product's cycle.

Finally, the relationship between design and sustainability and the life cycle are inserted into social and political contexts from the perspective of view of project, production, usage and post-usage of the product (SANTOS, 2003). Definitely, proposing the development of design for sustainability therefore means *"promoting the capacity of the production system to respond to the social search for well-being using a quantity of environmental resources that is drastically reduced compared to the levels now in place"* (MANZINI, VEZZOLI, 2002, 23).

Within this context, Santos and Pereira (1999) identified three fundamental stages in the packaging life cycle:

(1) CONCEPTION AND PRODUCTION: at this first stage the content to be packaged, its physical-chemical characteristics, conservation, packaging process, material to be used, production and transportation are considered.

(2) CONSUMPTION: at this stage sales procedures of the packaged product, its transportation and storage are considered. The consumption of packaged product and the user-packaging interface (use, conservation, information of packaging). The discard of packaging which becomes garbage.

(3) POST CONSUMPTION: For this phase, there are two possibilities. Reuse of packaging by consumer or recycling, including the complexities of collection, sorting and revaluing of the packaging. The other one is reducing at the source by using less raw material, recyclable products design and alteration of the production and consumption patterns.

In both strategies, the involvement and participation of the consumer are essential (THOGERSEN, GRUNERT-BECKMANN, 1997).

Within these stages, it is essential to not only analyze its function but also its dysfunction, since after all, packaging is the carrier of great environmental and human disasters. The function of packaging itself is delimited between the inception and consumption phase. During consumption, some deviations from the main function can be observed. For instance, health problems caused by contamination and inadequate discarding, producing garbage. These cases are called packaging dysfunctions. When a new use for packaging arises the authors call it re-function, i.e., the packaging is recycled returning to the production cycle or being reused for another purpose.

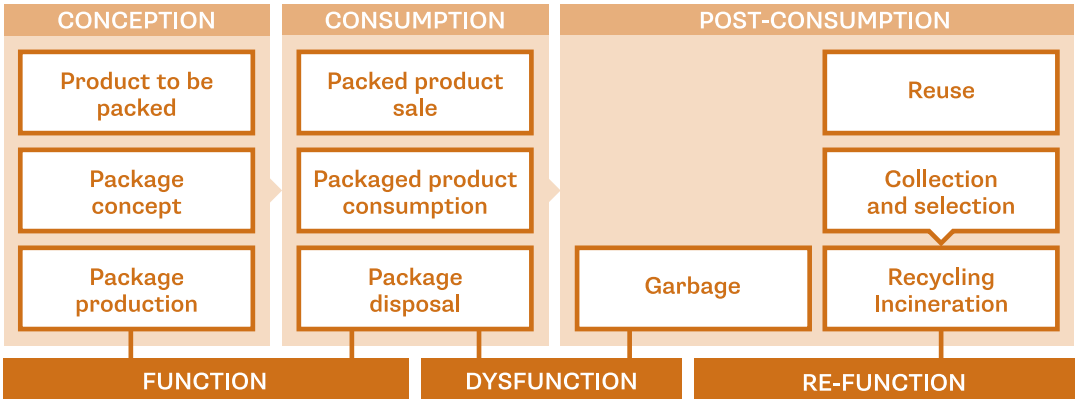

FIG. 1 The life cycle of packaging. Source: Santos e Pereira, 1999.

Warnings about the depletion of natural resources have been around in the public sphere of debates on the future of humankind since the 1960s. In fact, from that time onwards consciousness of the real limits of natural resources has been disseminated. This has been accompanied by a militant defense of the more rational application of such resources, considering the development of an "economy of means" as an alternative to capitalist standards inspired by the way populations of poor countries deal with available resources. In 1968 James Lovelock, the scientist, presented his thesis, *Gaia*, in which Terra (Earth) is understood as a self-regulating organism that maintains climactic and chemical conditions favorable to life.

At the same time publications and movements emerged denouncing the crisis caused by pollution due to uncontrolled industrial acceleration,

which leads to the organization of environmental defense and preservation organizations such as *Friends of the Earth*, in 1969 and *Greenpeace*, in 1971. This incipient movement towards consciousness peaks in 1972 at the time of the first world conference on the environment in Stockholm (Sweden), showing a progressive institutional consolidation of the environmental movement on the world political scene.

However only recently has this issue gained the appropriate sense of urgency considering its importance in the future of humanity, and it has now come to a point where it cannot be postponed. Therefore it is of essence to think of alternatives for less and more conscientious consumption, encouraging the re-use of materials in which we could call re-function. We must really rethink our material culture, as proposed by Stuart Walker: using what already exists may be the basis for a more effective and benign design bringing back the need to repair and reuse (WALKER, 2006).

In a converging perspective, the *"cradle to cradle"* concept is aligned with the logic of the "closed circuit". This concept, based on ecological premises has been under development for over twenty years by William McDonough and Michael Braungart, in order to prove that the large-scale production of goods and services can be achieved without deleting the planet's resources. McDonough and Braungart (2012) defend the application of a circular production economy in which the definition of choices occurs from the first moment based on an ample and fundamental set of questions: What does the product offer? How does it interact with human beings and the environment? What is the value of the materials used? What happens to the product when the client decides it has already fulfilled its function? Does it decompose? Disassemble? Is it recyclable? Does it end up in a garbage dump, incinerator or in the ocean? Can I recover it considering that the client is only "borrowing it" from nature?

ANOTHER (POSSIBLE) LOOK AT PACKAGING

This scenario reveals a great problem that design must deal with: the matter of discarding and post-using the fruit of its actions, i.e., discarding packaging that must always accompany the sale of products. Creating strategies for discarding, for re-materialization and recycling is a significant challenge for design action as an agent for transformation, a promotion of new lifestyles, especially in view of the acute environmental crisis we are facing.

The interest here goes beyond the discussion of practices that share certain characteristics, particularly concerning creative reuse of discards such as in the field of *non-pedigreed* design, the reuse of packaging such as oil cans to make domestic utensils such as kettles, cups, lamp, etc. These are "ways of doing" where the consumers find another function that was not originally foreseen for the standardized products.

Although the reuse of objects and packaging has been a subject of great interest inside and outside the field of design, with great repercussions on the last decades, it can be said that this is as old a technique as the existence of objects and packaging. These aspects have been closely linked since their origin. Often, however, not only for economic reasons, people have traditionally tended to transform their needs into virtues, in this case using discarded objects and packaging and generating creative interventions with new purposes and practical meaning that are symbolic in day-to-day application.

It is this creativity-rich raw material that Lina Bo Bardi collected in her *Tempos de Grossura* (1994), where she shows many cases of packaging reuse, such as oil cans transformed into new artefacts in an activity that takes their life cycle beyond their discarding point. An example by Lina herself, Fifó, the burnt out lamp that becomes an oil lamp by this process transforming an ending into a new point of departure, sophisticated material as a cultural product. As Lina says, "it is the close attention to small shards, lint and small chips, small remnants that allows us to reconstruct the story of civilizations through the millenia" (BARDI, 1994, 24).

The lamp, not being of interest to the oil lamp consumer becomes a glass container and loses its meaning as an industrialized lamp. In view of the lack of electricity creativity makes it into a new product, the oil lamp (FLAVIO MOTTA IN BARDI, 1994). The principle of resignification, inherent to such metamorphoses, which submits objects and packaging to so far unheard of conditions of use is ample and constitutes a common aspect in conditions of social poverty (CARDOSO, 2012).

Nowadays with the learning obtained from looks such as Lina's, it is possible to extend the complex matter of the agents involved in the post-use of packaging, that goes from the concept considered for disassembly, use of parts, reuse and recycling, but also takes the participation of the user and the designer into account in the various phases of packaging as a product.

FIG. 2 Oil lamps made from cans. Mercado de São José, Recife.
Photo: Ingrid Moura Wanderley.

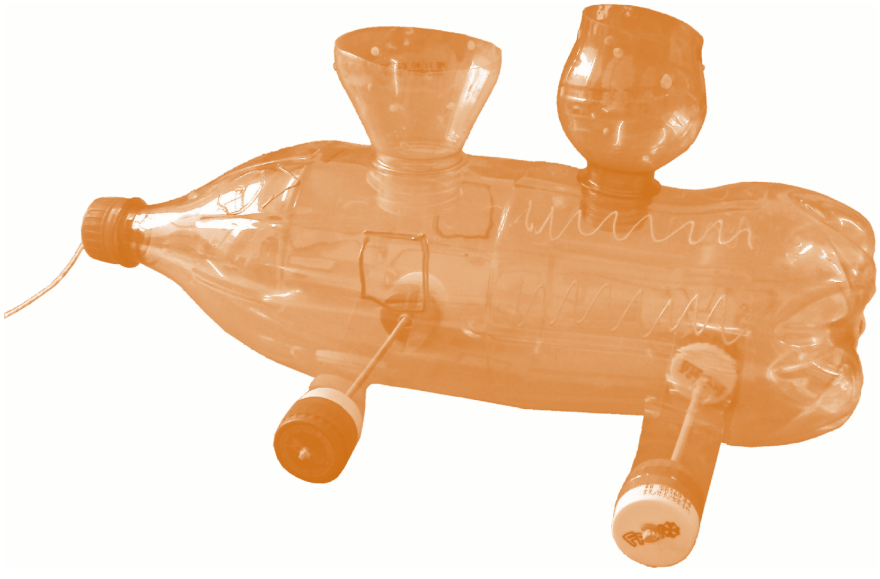

FIG. 3 PET car. Itinerant Toy Library of the Recife Municipality.
Photo: Ingrid Moura Wanderley.

The convergence between lack of materials and limited resources is not unusual, with an emphasis on the social dimension. This is the case of toys produced by monitors and children at the "Itinerant Toy Library of the Recife Municipality" (*Brinquedoteca itinerante da Prefeitura do Recife*). Their activities (toys and play) are carried out using material donated by the population itself. These actions result in the production of toys at a low cost thereby prolonging the useful life of other products or packaging, diminishing the amount of solid waste on the streets and in the garbage dumps, since the basic raw material consists of PET bottles, bottle caps, paper and old magazines, string and scraps of fabric, used pencils, etc. Certainly an example that updates some of the possibilities of a social bias in the work of the designer since the 1970s by Victor Papanek.

The reuse of materials such as old tires, PET bottles and cans or glass packaging, which reveals an ecological concern, cannot be considered a spontaneous act. It is rather an intention with a well-defined purpose and a Project directed at achieving the objective of reusing material.

In these examples, a strong concern with the post-use of products or of part of the products can be detected. On the other hand, this ecological concern is the source for the sale of new products. Within the present complex context concerning contemporary life, where we are forced to experience the awareness of the environmental problem, it is urgent to think of what is to be done with the immense amount of garbage and discarded material that is generated daily. Therefore, it is essential to (re)discover possible solutions for the urgency imposed by the volume of material that is to be thrown away as garbage.

Other than purely environmental and ecological concern, the redevelopment and reuse of materials from old and discarded objects is a huge source of raw material to make and sell new objects: *"fortunately for all of us one man´s garbage is another man´s luxury"* (CARDOSO, 2012, 158).

Some of the artefacts that have been recreated from metamorphoses of use and meaning are within the specter of a creative reuse economy. The sale of these artefacts obtained from the reuse of various materials can be an option to increase family income. This ranges from the case of survival of the poorest, but also reaches higher social classes where heavily spending people seek different products with a special identity.

The barbecue made out of a used oil drum is also a creative alternative. Identified as being a reuse of an object (drum for storing/transporting liquids) it implies prolonging the useful life of this packaging. An idea that became a small/medium business, maybe for some "visionary" who saw redevelopment as a way to do business.

FIG. 4 Oil drum barbecue (packaging for liquids).
Foto: Francisco Sales Trajano Filho.

What can be perceived in many products created from discarded materials is the speedy passage from the logic of improvisation to the logic of productive rationalization, from the typical non-design techniques, from bricolage, to sophisticated specialized design. There are increasing examples of solutions found for an unforeseen problem becoming an object of design for industrial production, An artefact that is transformed, recreated by simple people without training in design, can be reproduced serially, since its run-of the mill previous use ensures efficient performance of certain functions. This has been happening at several levels of production and marketing.

An example of this is the coconut grinder that is used at the CasaAmarela market in a low income district of Recife, created by an “inventor” from Nova Descoberta, a neighboring low income district. Probably a person with manual skills and ingenious at dealing with electrical and mechanical apparatuses, perhaps even a man with entrepreneurial vision creates, produces and sells devices so that the people on the market can sell ready ground coconut to their clients. The grinder is made from the electrical motor of a food processor, a plastic bowl for storage, a lid that protects the grinder from dust and accidents and a turned wood blade for grinding with stainless steel teeth. A quite elaborate product that is easy to use and where we perceive a thinking

of design with a high level of execution, sold to supply specific requests by the market stallholders.

These transformations raise a question: In spite of the abundance and variety of products on the market are there still needs that have not been met? (BOUFLEUR, 2006). These re-created artefacts from transformed goods, often born by deviating from their original function, reveal a lot about people's needs and wishes. In a way they strip us of our glamor as author/designers. The existing objects do not meet our material needs. They are rather a way of meeting the industrial, marketing and political needs of capitalism.

Several scholars have already warned that the objects are primarily generated by market requirements, through marketing and driven by fetishism in a scenario that does not appear to give much thought to responding to people's material needs. On the contrary they confound material needs with vital needs.

It can even be claimed that despite the differences and peculiarities of each person a strong aspect to be shared by this set of practices is the fact that they deal with what we understand to be certain *"deviation strategies"* or *"deviationist tactics"* (CERTEAU, 1994, 92), altering the usual humdrum destination of consumer waste, of garbage, transforming them into new goods in response to different requests for use, that are often entirely different from the original, unsuspected as to conception and which then give the objects produced according to these tactics, other meanings, significances and values.

Among other things, what these practices reveal may help find an answer to one of the basic problems of modern industry, i.e., the processing of the post use of consumer goods, in which the methods of repair, reconditioning, redistribution, material and component reuse are done in a rare, economically marginal way. In response to this marginal condition, inventivity must be encouraged in the day-to-day creation of something useful from scarce resources. Finding new uses, whether or not original, for what already exists is the basis for a more effective, benign design approach. In this way stimulating a return to the tendency to repair things and diminish our dependence on acquiring new products benefits both communities and society (WALKER, 2005).

Of course, there are practical and concrete examples of private initiatives that already work using packaging to make new products. Through an entrepreneurial vision and even for survival, many people use discarded consumer society waste transforming "garbage" into something new, with a new meaning. However, the public administration is still going very slowly in this direction, and it is urgent, that the appropriate ways of treating solid waste arise within the public and government sphere, considering the reuse of materials in order to act and benefit from product post use.

FINAL CONSIDERATIONS

Faced with the insatiable appetite for resources and energy of the post-industrial culture, which grows exponentially as the planet inhabitants multiply; considering the negative impact of goods, of garbage, our life styles have become a terrible environmental problem. A critical situation hangs over us and places the continuity of wellbeing and social and biological life itself at risk. Overcoming this crisis requires a dialogue between cultures and the participation of a number of agents, including designers, architects, artists and creators. Only interdisciplinary dialogue may foster the creation of a Brazilian repertoire of projects that hold solutions and incorporate packaging waste in a creative, diversified way.

In this society, where the new swallows the old and expels it vigorously, design can propose new paradigms which do not only refer to the reception and esthetic appreciation of recyclable and transmuted materials (SANTOS, 2008). This paradigmatic change highlights the classic statement by Professor Tony Fry (1994): *"Design comes before what we do and continues after it is done. This implies that design involves not only the designer but also the designed"*.

It is believed that through research, production of knowledge to change parameters for a a better quality of life will be achieved in Brazilian cities. Attention must be paid to healthy working conditions, appropriate handling of materials, issues that are appropriate to management for sustainability. Environmental sustainability is a serious issue due to the shrinking resources caused by excess consumption and rapid product obsolescence. Reusing, repairing, restoring with responsibility as well as using correct technologies at the local level are feasible alternatives to diminish the quality of Solid Urban Waste.

From this perspective design can be considered essential as a tool to think of advances and improvements both in product life cycle and recycling and reusing practices, and for the reappropriation of solid urban waste and being present in various stages of project, consumption, discard and post-consumption of products. Proposals are made to think of alternatives to contribute a design of eco-efficient products to be offered by industry.

Besides, in future research more efficient methodological bases must be established, appropriate to environmental management of the full cycle of packaging, therein including conception, production, and use and post-consumption. The creation of a National Law of Solid Waste brings hope to the struggle agains current borderline situations. Further research should be performed with contributions from government and private incentives for this law to be implemented and effective.

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SITUATING JUNK: ART, GARBAGE AND TRASH ONTOLOGIES

GILLIAN WHITELEY

At the outset of the twenty-first century, global economics is dominated by neo-liberalism and transnational corporations operate on the basis of hyper-production and cheap labour. Meanwhile, the accompanying scrapheap of obsolete manufactured goods and residual industrial waste grows on a world-scale at an exponential rate. If we define trash as excess resulting from commodity cultures and mass consumption then it could be argued that this 'scrapheap' has had some productive aspects. Certainly, it has provided a major resource for artists through the twentieth-century: from early Dadaists such as Raoul Hausmann with his irrational anti-aesthetic use of 'found objects', to contemporary socially and ecologically-engaged artists working with street litter or landfill detritus. Since the 1970s, Mierle Laderman Ukeles, residential artist with the New York Sanitation Department, has worked assiduously on Fresh Kills landfill at Staten Island, and with garbage more generally to highlight social and communal values of 'dirty labour' [1]. On a more pragmatic and serendipitous note, the Portuguese artist Francisco de Pajaro has recently acquired a cultish on- and offline following with his ephemeral installations using street litter in East London. Overnight, his comical painted monsters appear on

[1] See WHITELEY, GILLIAN, *Junk: Art and the Politics of Trash* (London, 2011).

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[1] See WHITELEY, GILLIAN, *Junk: Art and the Politics of Trash* (London, 2011).

mounds of bin bags and discarded mattresses, only to be swept away the following day[2].

Of course, rubbish continues to feature in a diverse range of contemporary art practices but specific artworks are informed by radically different, often conflicting, aesthetic, philosophical and political motives. In *Junk: Art and the Politics of Trash* (2011), I explored some of those distinctions in relation to specific artworks at particular times and in particular places. Here, I want to re-present some of the introductory material from that project (in abridged form[3]) and then briefly reflect on some current trash thinkings and practices which suggest a contemporary shift away from an affinity with *garbology* to an emphasis on *ontology*.

BRICOLAGE CULTURE

It is mid-summer 2006 and I am sweltering in the clammy heat beneath the corrugated metal roof of Hauser and Wirth's vast Coppermill gallery in London's East End, amidst an enormous environment of rotting, dribbling matter created over many years by Dieter Roth[4]. Explaining that it was impossible to see where the artwork begins and ends in the gallery space, one reviewer described it as a 'begrimed indoor city'[5]. Roth started *Large Table Ruin* in the early 1970s when, by chance some of his tools got stuck in solidified puddles of goo on his work-bench. Over the next 20 years,

> *the work took on a life of its own, and by a slow process of accumulation became a sprawling configuration of table-tops, out of which grew towering piles of lashed-together junk, until by the end it became a multi-layered agglomeration, its surfaces laden with rafts of debris, illuminated here and there by a wonky lamp.*[6]

The installation is a conglomeration of dust-covered objects, boxes, bottles, oozing filthy liquids, unidentifiable sticky substances and abject matter,

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2 See *http://www.theguardian.com/artanddesign/2013/oct/02/art-is-trash-artist-sculpture-rubbish*

3 The following text is an adapted abridged excerpt of the introduction to WHITELEY, GILLIAN, *Junk: Art and the Politics of Trash* (London, 2011).

4 DIETER ROTH/MARTIN KIPPENBERGER exhibition at Hauser & Wirth's Coppermill, 92-108, Cheshire Street (London, 26 May - 27 August 2006).

5 SEARLE, ADRIAN, 'Dust-to Dust', *The Guardian*, 30 May 2006, P. 18.

6 SEARLE, ADRIAN, *The Guardian*, P. 19.

the whole teetering on the brink of collapse. Roth's 'cacophonous agglomerations of found objects'[7] invite and resist interpretation. Indeed, Roth's work more generally was an agglomeration of disparate activities, ranging from writing poetry and composing symphonies to creating art objects from the pulped writings of Günter Grass. In this instance, Roth's preposterous tableaux provoke hilarity but they also initiate thoughts about the fundamental nature of materiality and the fragility of human existence. Decomposition and entropy connote the transition from unity to disunity, disintegration and chaos. Roth's shambolic jumble is a riot in material form.

In the cavernous Coppermill warehouse, the messiness of Roth's installation is deceptive: it has been painstakingly curated. The dribbling fluids are reminiscent of the junk tableaux and assemblages made by Ed Kienholz in the 1960s and 1970s. A retrospective exhibition of the work of Ed and Nancy Redding Kienholz at the Baltic in summer 2005 brought together a series of installations and assemblages which presented a polemic on war, global poverty and social injustice[8]. There, the viewer moved out of the newly renovated space of the Baltic onto the Tyne riverside, an area once heaving with the industrial dirt and noise of the shipyards, but now a sterile place of neatly organised visitor centres and heritage sites – a homogenised, planned, controlled environment where nothing is intended to disturb the visitor experience. The powerful message of the Keinholz exhibition was stifled by its immediate surroundings: as elsewhere, ubiquitous 'culture-led re-generation' has removed any real sense of historical particularity.

In contrast, I step out of the Roth installation into the jumbled material environment of the streets around Brick Lane, an area eternally on the cusp of social and demographic transition. Here the ramshackle bric-a-brac of decaying stuff integrates into its surroundings. Thriftstore stench segues into a rash of 'vintage' clothes shops which have sprung up around Spitalfields, racks of shoes and bags tumbling over and onto the pavement representing the recent shift into 'eco-chic', a greener brand of consumerism. Litter and edible leftovers spill onto the streets around the gallery. A bin is stuffed with congealed liquids oozing into each other and the physical matter in a state of flux reflects the historical layering of ethnicities and migrating cultures of the East End. Coppermill, once

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7 ROBINSON, JULIA, 'The Voracious Vernacular', in ***Assemblage***, New York: Zwirner & Wirth (11 November 2003–31 January 2004).

8 VINCENTELLI, ALLESSANDRO (ed.), EDWARD KIENHOLZ AND NANCY REDDIN KIENHOLZ, exhibition catalogue, Gateshead: Baltic Centre for Contemporary Art (14 May–29 August 2005) and Sydney: Museum of Contemporary Art (16 December–5 March 2006).

a factory, now an art gallery[9], is situated in an area that is a palimpsest of cultural history, a vibrant anarchic environment where materiality meets social life in a messy tension of economic inequalities and cultural diversity. In her recent study of London as an archetypal 'world city', Doreen Massey relates the capital's environment to the 'mixity' of lived practices. Massey writes of the crisscrossing multiple allegiances described by Saghal and Yuval-Davis in what Gilroy has termed 'a convivial demotic cosmopolitanism'[10]. Monica Ali's novel, *Brick Lane*, operates within this framework of criss-crossing 'mixity'. Nazneen, the Bengali heroine and narrator, captures the cultural and material paradoxes of the environment as she describes the sounds and smells, wandering through the streets

> *[...] stacked up with rubbish, entire kingdoms of rubbish piled high as fortresses with only the border skirmishes of plastic bottles and grease-stained cardboard to separate them [...]* [11]

The surrounding urban environment at Coppermill can be experienced as Massey's 'mixity', as a *bricolage*[12] of heterogeneity, an array of objects and textures, social and cultural tensions, physical matter and architectural structures. The city itself is like a gigantic assemblage of junk continually being re-made and re-inscribed. My encounter with Roth's installation of trash in this particular location resonates with Colin Rowe's description of the 'collaged city' in 1975 - as a place of 'collisive fields and interstitial debris', as 'culturalist bricolage'[13].

All confrontations with artworks are embodied experiences. They are *located* and *temporal* viewings: they need to be considered as *situated* encounters with stuff. Massey has emphasised the importance of considering this space/time dialectic in relation to 'place'. She points out, 'in debates around identity, the terminology of space, location, positionality and place figures prominently' – she reminds us to be mindful of 'the politics of location' and not to forget to *politicise* the spatial[14].

Mesmerised by the smashed bottles, oozing liquids and the claustrophobic heat inside Coppermill, I recalled that this specific moment was exactly a year

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9 Coppermill had been home to four generations of a local family-run business in the 'rag trade'. Press release May 2006, Hauser & Wirth.

10 MASSEY, DOREEN, *World City* (London, 2007), P. 4.

11 ALI, MONICA, *Brick Lane* (London, 2004), P. 55.

12 A bricoleur is a '...jack of all trades or a kind of professional do-it-yourself person'. LÉVI-STRAUSS, CLAUDE, *The Savage Mind* (1966), P. 17.

13 ROWE, COLIN, *Collage city*, The Architectural Review CLVIII/942 (August 1975), P. 66.

14 MASSEY, DOREEN, *Space, Place and Gender* (London, 1994), P. 249.

since a young British Asian man had blown himself up in a carriage on the London Underground at nearby Aldgate East. In this moment, the vectors of place and materiality are inexorably political.

THE GLOBAL SCRAPHEAP

> *We head into the hills to see the biggest of the mega-city's rubbish mega-pits: the Changshengqiao landfill site – a giant reservoir of garbage, more than 30 metres deep and stretching over 350,000 square metres. The waste engineer, Wang Yukun, tells me the city produces 3,500 tonnes of junk every day. None of it is recycled. Some is burned. Here, it is layered like lasagne: six metres of rubbish, half a metre of earth, a chemical treatment and then a huge black sheet of high-density polyethylene lining. The site opened in 2003 and it already contains more than a million tonnes of rubbish.*[15]

Waste is, of course, an adjunct of luxury. Junk, trash, garbage, rubbish, refuse – whatever we call it – is dependent on economic wealth and excess production. Industrialised hi-tech urban cultures produce and thrive on the market for new and disposable goods. In 1960, Vance Packard warned the rest of the world of the environmental consequences of American-style 'hedonism for the masses' and 'planned obsolescence' in his classic study, *The Waste Makers*.[16] Since then, dealing with gargantuan amounts of rubbish has become a key crisis management topic. Popular and scholarly accounts chronicle alarming statistics on domestic and industrial production of rubbish which suggest that we are in danger of being completely overwhelmed by its accumulation. As Girling warns us:

> *Every hour in the UK we throw away enough garbage to fill the Albert Hall. A gathering tsunami of rubbish – organic and inorganic, active and inert, electronic, aural and visual – pours into our lives and out again, into a world no longer infinite.*[17]

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15 WATTS, JONATHAN, *Invisible city*, Guardian Unlimited, 15 March 2006. *www.guardian.co.uk/china*
16 PACKARD, VANCE, *The Waste Makers* [orig. 1960] (Harmondsworth, 1961).
17 GIRLING, RICHARD, *Rubbish! Dirt on Our Hands and Crisis Ahead* (London, 2005), P. 2.

Recent figures on the production of garbage in the USA show Packard's warnings were not heeded and that trends have escalated. In her book, *Gone Tomorrow, The Hidden Life of Garbage*, Heather Rogers demonstrates how the USA, the wealthiest country in the world, leads in the production of trash – in 2003, almost 500 billion pounds of paper, glass, wood, food, metal, clothing, dead electronics and other refuse were burnt, dumped at sea or 'buried under a civilised veil of dirt and grass seed'.[18] As she oulines:

> *The United States is the world's number one producer of garbage: we consume 30 percent of the planet's resources and produce 30 percent of all its wastes. But we are home to just 4 percent of the global population. Recent figures show that every American discards over 1,600 pounds of rubbish a year – more than 4.5 pounds per person per day. And over the past generation our mountains of waste have doubled.*[19]

With current concerns about climate change and the rapid growth of cities within and outside the West – Chongqing, Guangzhou and others in China, for example [20] – narratives about the global scrapheap have become apocalyptic.[21] The politics of geography creates abundance in some parts of the world and waste, scarcity and poverty in others – with the twenty-first century development of rapidly expanding 'global cities' though, these extremes are often, simultaneously, at their most visible.

Sustainability and 'thinking green' are increasingly fashionable in the economically rich West but working with trash, creatively or in any other way, has historical, cultural and social connotations which relate to hierarchies of materials at particular times and in particular places. Detritus has ideological, social, political contexts and associations. Anyone forced to work with other

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[18] ROGERS, HEATHER, *Gone Tomorrow: The Hidden Life of Garbage* (New York, 2005), P. 2. This represents 236 million tons annually of municipal solid waste (EPA website *www.epa.gov/epaoswer/non-hw/muncpl/facts.htm*). Other studies give higher figures, e.g., Scott Kaufman gives 369 million tons or 7 pounds per day in 'National Garbage Survey Highlights Opportunities for Americans to Move from Being Waste-Full to Waste-Wise', Earth Institute News, *www.earthinstitute.columbia.edu/news/2004/story 01-23-04.html*

[19] ROGERS, HEATHER, *Gone Tomorrow: The Hidden Life of Garbage*, P. 2.

[20] Between the start of Deng Xiaoping's market-orientated reforms in 1978 and 2005, the annual growth rate of national income, according to World Bank data, averaged 9.7 per cent – a 12-fold increase. See REDDY, SANJAY, 'Death in China', *New Left Review*, 45 May/June 2007, P. 49.

[21] In *Planet of Slums*, London, 2006, MIKE DAVIS provides extensive statistics on the escalating global production of rubbish and the incapacity of respective authorities to deal with it, e.g., he reports that in Kabul in 2002, the city planning director noted that every 24 hours, 2 million people produced 800 cubic meters of solid waste and, if 40 of their trucks made three trips per day, they could only transport 200 or 300 cubic meters out of the city.

people's garbage – from office cleaners to sewage workers – recognises this. Everyone contributes to the domestic rubbish tip and landfill sites but the processing of waste is generally left to those on the social and economic margins. Besides having one of the world's fastest growing economies, India has become one of the largest dumping grounds for the rest of the world's toxic 'e-waste'. In Delhi, for instance, more than 10,000 people are employed in recycling activities, with little awareness of the health hazards and no control over working conditions; children dismantle the e-waste by hand to recover the valuable parts from the components contaminated with lethal toxins such as lead, cadmium and mercury.

> *The fumes get worse at night – sometimes it's hard to breathe, you feel like you're choking. A girl died here last year. She had asthma. And one night she choked. The people have argued with the workshop owners, but the police are bribed, so nothing changes [...] we're from Gwalior, in Madhya Pradesh, but there's no work there, so we can't afford to go back [...]*[22]

Paradoxically, whilst the social outcasts and destitute children of India process lethal cyberjunk, in other parts of the world it is fashionable to work with trash. In the UK, local authorities are increasingly devising more elaborate recycling projects for household waste and every facet of everyday life and culture is subject to 'eco-spin'. Advertisements market products with promises to reduce or offset carbon footprints; retail stores have competed to limit their use of packaging and whole towns have declared 'plastic bag free zones'.[23] A plethora of exhibitions, such as *Well fashioned – Eco style in the UK*, have presented new green design approaches, incorporating re-using and recycling.[24] Discarded stuff is currently being explored and researched from every perspective with the study of trash - *garbology* - now regarded as a field of study in its own right. Chief pioneers were William Rathje and Cullen Murphy who, in 1973, set up their extensive archaeological initiative, the *Garbage Project*, at the University of Arizona, which evolved into 'a multipurpose enterprise whose interests include diet and nutrition, food waste,

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22 Zayek, aged 12, an e-waste recycling worker living in Anup Vihar, Delhi, quoted in GERRARD, SOPHIE, 'Cyberjunk', *The Guardian Weekend*, 30 June 2007, P. 38.

23 See the ***Traders Manifesto*** of July 2007 at *www.plasticbagfreehebdenbridge.co.uk*

24 See, for example, ***Well Fashioned – Eco Style in the UK***, exhibition at the Crafts Council Gallery, London: (23 March – 4 June 2006) at *www.craftscouncil.org*

consumerism, socio-economic stratification, resource management, recycling and source reduction, and the inner dynamics landfills'.[25]

Justin Gignac's NYC Garbage boxes might be viewed as the epitome of the contemporary cultural fascination with trash. Gignac has created a lucrative online business out of packaging and selling rubbish collected from New York City streets. His exquisitely designed boxes appeal in a number of ways: visually and aesthetically, they convey the beauty of the ruin and have intimations of mortality; they are 'exotic' souvenirs which reference collective memory and a vicarious glimpse of 'other' lives. The minimal see-through cubes also give them a contemporary look which means they could just as easily be executive desk toys or ornaments for inner-city loft apartments. Disguised as ecologically-sound purchases they are parasitic on a throwaway culture but, at the same time, they have the talismanic and fetishistic properties of the *objet trouvé*.

> *I sell garbage. I scour New York City streets picking up trash. After filling bags with subway passes, Broadway tickets and other NYC junk, I carefully arrange plastic cubes full of the stuff. Each box is unique and won't leak or smell. The cubes are then signed, numbered and dated, making them perfect for anyone who wants their own piece of the NYC landscape. Just get one now before they clean up this city.*[26]

They are part of a 'garbage aesthetic', something identified by Ella Shoat and Robert Stam in relation to the complex nature of multifaceted global economic development. For them, the 'aesthetics of garbage' is a form of 'revalorisation' which inverts what has formerly been seen as negative, especially within colonialist discourse. They note that the coexistence of pre-modern, modern and postmodern economies produces a series of interlinked, coeval worlds living the same historical moment but under diverse modalities of subordination and domination. As they point out, the recuperation of trash as art in West and Central Africa exemplifies a strategy of resourcefulness in a situation of scarcity.

> *The trash of the haves become the treasure of the have-nots: the dark and unsanitary is transmogrified into the sublime and*

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25 See RATHJE, WILLIAM L. and MURPHY, CULLEN, *Rubbish! An Archaeology of Garbage* (Arizona Press, Tucson, 2001)

26 See *www.nycgarbage.com*

the beautiful [...] as a diasporized, heterotropic site, the point of promiscuous mingling of rich and poor, center and periphery, the industrial and the artisanal, the organic and the inorganic, the national and the international, the local and the global: as a mixed syncretic, radically decentred social text, garbage provides an ideal postmodern and postcolonial metaphor.[27]

If, as Shoat and Stam note, garbage is the ideal postmodern and postcolonial metaphor, then Gignac's NYC garbage boxes encapsulate a contemporary global obsession with waste and obsolescence. In Gignac's boxes, the 'dark and unsanitary is transmogrified into the sublime and the beautiful' – but in this case, the trash of the haves becomes the treasure of the haves. They encapsulate the current fascination and fetishisation with trash and a reification of the throwaway by Packard's 'waste-makers' for their own waste.

The histories, discourses and narratives of trash are multiple – from its associations with transgression and dissent to its appropriation as souvenir kitsch. Importantly though, its histories are no longer marginal or secret. Shifting beyond garbage as 'the ideal postmodern and postcolonial metaphor', trash has become the trope of the turn of the twenty-first century, with, as Nicolas Bourriaud has identified, the 'flea market' as an 'omnipresent referent'

[...] since the early nineties, the dominant visual model is closer to the open-air market, the bazaar, the souk, a temporary and nomadic gathering of precarious material and products of various provenances [...][28]

With 'the nomadic gathering of precarious materials and products' using 'recycling (a method) and chaotic arrangement (an aesthetic)', the ragpicker and the bricoleur – both in the anthropological sense expounded by Claude Lévi-Strauss and as one of the makeshift strategies of everyday life outlined by Michel de Certeau[29] – present powerful models for recent and current artistic practice. Over the last decade, the Los Angeles-based artist, Tom Sachs, has explored the model of the

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27 SHOAT, ELLA and STAM, ROBERT, 'Narrating visual culture – towards a polycentric aesthetics', in N. MOERZOEFF (ed.), *The Visual Culture Reader* (London, 1998), PP. 42-3.

28 BOURRIAUD, NICOLAS, *Postproduction* [first published 2002] (New York, 2005) (second edition with new preface 2005), P. 28.

29 See de CERTEAU, MICHEL, *The Practices of Everyday Life* [trans. Steven Rendall, first published 1984] (Berkeley/Los Angeles and London, 1988).

'make-do ethics of bricolage'[30] extensively in his own work and in curatorial projects. Sachs continually blurs the distinction between art and design, mixing idioms and re-contextualising trash, consumer products and mundane materials to create installations, sculptures and functional objects.[31]

ART AND TRASH

Evidently, the motivations behind the ubiquitous theoretical and practical appropriations of trash are myriad. Art's use of trash, therefore, needs to be read accordingly – within multiple social, cultural and geographical contexts and specific cartographies, chronologies and ethnographies. Detritus of various kinds has been a central feature in art practices throughout the twentieth century. The early Surrealists prized and fetishised the *objet trouvé* whereas 'junk art' is primarily associated with the idiom of assemblage – a set of object-based practices which emerged in the mid-1950s and culminated in the seminal exhibition *The Art of Assemblage* in New York in 1961.[32] With its deployment of the ephemeral, the discarded and the filthy, assemblage was viewed as a disruptive, transgressive art form which engaged with narratives of social and political dissent, often in the face of modernist condemnation of such work as worthless *kitsch*. Parallel techniques flourished in visual and literary culture in Western Europe, the USA and Australia but the idiom of assemblage and the continued re-use of found materials and objects have proliferated in art, popular culture and craft traditions all over the world with folk cultures reclaiming and re-using consumer objects.[33]

Since the 1960s, the employment of waste and found materials and the idiom of assemblage – with artist as *bricoleur* – have been particularly prevalent in global contemporary art practice. *Junk: Art and the Politics*

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30 SACHS, TOM, *Space Program*, exhibition at Gagosian Gallery, Los Angeles: (8 september–13 october 2007).

31 See BLOEMINK, BARBARA, 'The Continuum between and Transformations of, Art and Design', in B. BLOEMINK et al. (eds), *Design=/Art: Functional Objects from Donald Judd to Rachel Whiteread* (Merrell/Cooper-Hewitt National Design Museum, London/New York, 2004). In 2000, Sachs organized American Bricolage an exhibition of work by American artists at Sperone Westwater, New York.

32 SEITZ, WILLIAM, *The Art of Assemblage*, exhibition catalogue, New York: Museum of Modern Art (1961).

33 For example, see SARIFF, S. (ed.), *Recycled Reseen: Folk Art from the Global Scrapheap* (New York, 1996).

of Trash explores some specific moments of coalition. Echoing Massey, it situates junk-based practices by politicising the spatial and examining the cultural politics of location, whilst keeping in mind art's specific genealogies. It focuses on specific mid-century practices and their contemporary legacies largely within the Anglophone world but with a conscious attempt to situate them within a framework of the kind of polycentric aesthetics which Shoat and Stam arguefor. Hopefully, it will make a small contribution to an evaluation of art's historical and current appropriation of trash within an eco-conscious and economically diverse globalised culture.

ADDENDUM: FROM GARBOLOGY TO ONTOLOGY

> *Thing-Power*: the curious ability of inanimate things to animate, to act, to produce effects dramatic and subtle.[34]

Since researching and writing *Junk: Art and the Politics of Trash*, there have been a number of social, ecological and cultural developments relating to waste that are pertinent to a further discussion of art and trash. In the last few years, in an attempt to reduce landfill, many major retailers in the UK have introduced schemes to limit the profligate use of plastic carrier-bags and local councils have become adept at setting up recycling schemes for domestic waste. Local authorities acquire eco-credentials and companies and industries embrace the marketing potential of 'green-washing', whilst managing to deflect responsibility for environmental pollution onto individuals. In an inversion of economic values, landfill itself has become a valuable asset to be plundered, not only by the 'rag-pickers' of India or the *karang guni* of Singapore, but by specialist international mining companies prospecting for valuable metals buried deep beneath layers of trash on Western European landfill sites.[35] Garbology continues to turn trash into treasure.

Cultural recuperations of waste continue apace. For six months during 2011, visitors to the Wellcome Trust's extensive exhibition, *Dirt: the Filthy Reality of Everyday Life* (at its swanky squeaky clean London headquarters)

[34] BENNETT, JANE, *Vibrant Matter, A Political Ecology of Things* (Durham and London, 2010) P. 6

[35] *Costing the Earth, CSI Landfill*, a BBC Radio programme (9 October 2013) focused on a Belgian landfill site currently being systematically mined for raw materials such as timber and valuable metals which had been deposited routinely there in the 1960s and 70s.

were able to explore the social and cultural histories of domestic cleaning, urbansanitation, public health and hygiene, rubbish-collection and disposal through historical and contemporary exhibits, artefacts, documents and books in a range of multimedia formats. Its different perspectives on 'dirt' ranged from the development of housekeeping regimes in Delft to the plight of current day dry-latrine scavengers in New Delhi. Of course, Mayhew's publication, *London Labour and the London Poor* (1851), featured with accompanying images of 'toshers', 'sewer-workers' and 'bone-grubbers'. In addition, each themed space included contemporary artworks, some of which, such as Serena Korda's *'Laid to Rest'* project, had been especially commissioned for the show. Santiago Sierra's huge blocks of sculpted human excrement and Korda's ritualised burial of her dust-brick stack reminded us just how much 'dirt' continues to be an integral part of our daily life. Yet, overall, the exhibition failed to provide any real interrogative investigation of the more urgent global, or local for that matter, questions of the political economies of sanitation, public health and ecological issues surrounding organic or inorganic waste.[36]

For me, a far more interesting 'recuperation' of waste is related to a relatively recent philosophical trend: 'new materialism'. As an amalgam of disparate re-thinkings of the value and inter-relationship of stuff and objects, new materialist thinking has gathered momentum - along with its detractors – in critical circles. Drawing on Felix Guattari's ideas on 'ecosophy' and Bruno Latour's notion of the world as a complex interplay of 'actants', recent associated writings – articulated as a fresh *ontological* approach – counter the idea of matter as inert. Instead of conceptualized as discrete or closed, new materialists seek to understand matter and objects as contingent, unstable and 'entangled', as 'open, complex systems with porous boundaries'.[37] As a critique of conventional Western dualist ontology, new materialists resist the primacy of linguistic and representational theories. They espouse a world of generative matter in which objects are agentic and material is constitutive, eschewing the distinction between organic and inorganic, inanimate and animate. Such ideas lead to the possibilities of what might tentatively be described as a new *ontology of trash*, as evoked by Jane Bennett in her book, *Vibrant Matter*.[38]

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36 The exhibition ***Dirt: the Filthy Reality of Everyday Life*** was presented at the Wellcome Foundation, London from 24 March to 31 August 2011, accompanied by a publications, a BBC TV series Filthy Cities and season of activities including a programme of Dirty Tours, Dirty Events, Dirty Banquets, Scratch and Sniff Cards, Filth Fair, and Family Days.

37 See COOLE, D and SAMANTHA FROST, 'Introducing the New Materialism' in DIANA COOLE and SAMANTHA FROST (eds), ***New Materialisms, Ontology, Agency and Politics*** (London, 2010), P. 15

38 BENNETT, JANE, ***Vibrant Matter, A Political Ecology of Things*** (Durham and London, 2010).

Bennett urges us to consider not only the sensuous enchantment of nature but to re-invoke the actant capacity and affectivity of organic and inorganic things. In a notably lyrical passage of the book, *Thing-power I: Debris*, she muses on an encounter with trash on Cold Spring Lane, Baltimore.

> *Glove, pollen, rat, cap, stick. As I encountered these items, they shimmied back and forth between debris and thing – between, on the one hand, stuff to ignore, except insofar as it betokened human activity [...] the items on the ground that day were vibratory – at one moment disclosing themselves as dead stuff and at the next as live presence: junk, then claimant; inert matter, then live wire.*[39]

Bennett's 'new' appeal for a re-prizing of the interconnections of stuff can be dismissed as merely a gothic sensibility or romantic transcendentalism. Nevertheless, in my view, Bennett's and other 'new materialist' and 'object-oriented' approaches represent some of the most significant developments for a re-thinking of human, and cultural encounters with trash.

Resonating with some of those ideas and engaging with a revisiting of all things 'feral', I want to end with the work of a contemporary artist who works evocatively and affectively with trash. Since the 1990s, Spanish-born conceptual artist Lara Almarcegui has explored the relations between architecture and urbanism, focusing on abandoned spaces that are in the process of being demolished. One of her most interesting projects has been to document derelict wastelands and, importantly, to work to preserve them in their unplanned, feral state so that their processes of decay and wilding can be witnessed, observed and encountered.[40] For me, this does have a politics: it occupies space affectively and for no purpose, it denies and refutes capitalist productivism. In its fostering of a feral environment, it is informed by the old garbologies but it suggests the possibilities for a new *ontology of trash*.

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39 BENNETT, JANE, *Vibrant Matter, A Political Ecology of Things* (Durham and London, 2010). P. 4-5.

40 See ALMARCEGUI in *Radical Nature: Art and Architecture for a Changing Planet 1969-2009*, exhibition catalogue, Barbican Art Gallery, London, 2009.

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VIVIFYING POLICY

THE CONSTRUCTION OF THE NATIONAL POLICY OF SOLID WASTES

TERESA VILLAC

THE BIRTH OF A DEBATE

The National Policy of Solid Wastes (*PNRS*) arrived on the Brazilian scene after 20 years of going through Congress. The long time elapsed, in itself indicates the need for reflection, because – after all – the time it took can be considered as a symptom of the need to mature, of inertia or conflicts that, somehow had to be overcome, even if not necessarily reconciled.

This chapter aims to present an analysis of the construction of the PNRS based on the examination of its process of going through the legislature, complemented by the reflexive reading of the legal text, so that the actors and conflicts in the political arena of the National Congress can be identified based on these instruments.

The focus is the *process* of elaborating the policy[1] (SPINK, 2013) and the study is important because it is the first national regulatory framework on solid wastes aimed at all of us: private persons, firms, public corporations, private

[1] Distinguishing between realism (public policy as a fact) and perspectivism (public policy as a process), the author states: "If at the first line of public policies there is a dedication to something that really exists, in the second line we can talk of perspectives: from topc down, from outside in and from inside out; of groups that are present and groups that are excluded and absent, becoming vulnerable. One does not give up what is real, but acknowledges that, depending on the place and look, the situation might be – for all practical purposes – considered plural." (P. 164).

corporate bodies. The policy aims are also very broad, concerning appropriate management and environmental disposal of solid wastes in Brazil. But that is not all: it is at the same time a policy to prevent and reduce wastes, for environmental sanitation and urban sustainability, besides having as one of its guides the social inclusion of pickers of recyclable materials. All of this broad spectrum of guidelines points to the relevance and socioenvironmental, economic and managerial complexity of the National Policy of Solid Wastes.

In this context, a few questions were presented before the the reflexivity initially proposed: Did we need a PNRS? If so, what is the relevance of this public policy and why, up to 2010, was there no national public policy on the topic in Brazil?

In order to prepare the way, we first examined these questions based on the contextualization of the " solid wastes" topic on the international scene.

RESTROSPECTIVE VIEW: GARBAGE AND THE WORLD

For a better understanding of the topic that we proposed, we believe that it is appropriate to contextualize the topic of "wastes" on the international scene and the question of when "garbage" became a problem and was inserted into the international public agenda to undertand Brazil's position in this process.

Environmental awareness grew slowly in international society, highlighting the Club of Rome report The Limits of Growth in 1972. In turn, critical cases of contamination due to discarding wastes on the soil triggered a public reaction with the insertion of the problem of "wastes' into the political agenda (REI, 2010).

The author refers to the contamination that occurred at Times Beach (USA-1982) when dioxin was used to abate the street dust, which led to stricter terms in the Resource Conservation and Recovery Act (RCRA) in 1984.

In a survey of the case mentioned, from the perspective of examining the efficacy of the right of access to socioenvironmental information, it was found that the data on dioxin contamination at Times Beach are available at the Environmental Protection Agency (EPA)[2] sites, including the amounts of dioxin. An investigation by EPA found soil contamination, and ultimately the city inhabitants were permanently relocated and the properties were acquired by the government, showing socioenvironmental and economic impacts.

According to Rei (2010), irregular transboundary transport of wastes

[2] *http://www.epa.gov/region07/cleanup/npl_files/ mod980685226.pdf*

from the *Drums of Seveso* case (1982) was the trigger to place the topic on the European public agenda, leading to regulation in the then European Community, through Directive n. 84/631/EEC of the Council, regarding surveillance and control of transboundary transfers of hazardous wastes in the Community.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was concluded in 1989. Brazil joined and this was internalized in the legal system in 1993 (Decree 875).

In a further look at the problems of "wastes" and their insertion into the international agenda, a study indicated that, already in 1975, there were regulations about wastes in the then European Economic Community (Directive 75/442/EEC). In turn, Directives 78/319/EEC and 91/689/EEC had dispositions about toxic and hazardous wastes. They were followed by Directive 2006/12/EC, of the European Community and Directive 2008/98/EC, of the European Parliament and the Council, currently in force, that aims at protecting the environment and human health by preventing adverse impacts of waste production and management.

Despite the advances, access to information, participation of the public in the decisions making process and access to Justice for environmental issues were only recognized by the European Union (Aarthus Convention – Decision 2005/370/EC) in 2005.

Currently, the hierarchy of waste management in the European Union prioritizes waste prevention and presents disposal in landfills as a last possibility.

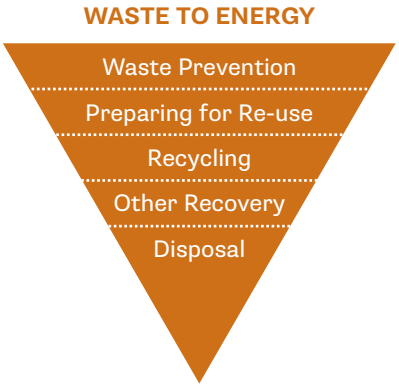

FIG. 1 Waste Management Hierarchy in the European Union
Source: Waste Prevention – Handbook: Guidelines on waste prevention programmes

The analysis performed enabled identifying a few triggering factors to insert the problem of "wastes" into the international agenda: negative reper-

cussion of contaminations, public pressure, political and sovereignty issues.

In this scenario one must not ignore the relevant role of a few social actors, whether individuals - such as Rachel Carson whose studies (CARLSON, 1962) helped make the public in general sensitive to environmental contaminations and led to creating EPA (1970), or organizations – such as the United Nations in International Conferences about the environment, or Non-Governmental Organizations, as seen in the Summary Table about the growth and consolidation of the environmental consciousness presented by Feldmann (2011).

In turn, the epistemic communities also acted in the international decision-making process about environmental issues (MORAES, 2011). At this point we have arrived at what we believe is an inflection point to which we would like to call attention. It is the role of science in relation to contemporary socioenvironmental problems.

We consider it essential that knowledge not be limited to the physical and intellectual campus of universities, and that the actors of the academy seek greater interconnection with the social tissue, from a perspective appropriate to the organicity and meaning in relationships. At this point, unfortunately, Waters[3] (2006) warning about the frequent consequences of academic production is still current: an end in itself:

> *The product is all that matters, not its reception, not human use. This is production only with the value of an end in itself, and practically nothing else. For the academic who lives under this regime, the work that defines his life has isolated him from living experiences [....]*

Thus it is that in environmental matters science has undergone its own process of institutionalization, and today has become a social entity that "is taken into account" (LOPES, 2001). It seems to us that there is a responsibility of the academic community, whether it be concerning the applicability of socio-environmental knowledge, or reflexivity by means of teaching and training new actors. And further, considering that, as one will see in this study, there are not only environmental implications, but also economic ones that result from the National Policy of Solid Wastes, internal and external relations that are established in the field of science[4] should be weighed in order to identify who is talking, from where they are talking, and the legitimacy of what one is talking about.

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[3] Havard University Press editor.

[4] The ontological meaning used for scientific field was that employed by Bourdieu (2003).

SENSITIVE LISTENING[5] AND LEGISLATIVE PROGRESS OF THE PNRS

The debate about the National Policy of Solid Wastes began in the Federal Senate with PLS 354/89 a law bill on packaging, collection, treatment and transport and final disposal of health services wastes. It was approved in the Senate, and revised in the House of Representative, and went through as PL 203/91, to which more than one hundred other law bills were attached (JARDIM, MACHADO FILHO, 2012).

Two Special Committees (2000 and 2005) were formed. with later approval in the Plenary. Again a public hearing was held in the Senate, and the PNRS was ultimately approved in the Plenary in 2010 and sent for presidential sanction.

FIGURES 2 show the legislative process in the two Houses: Senate and House of Representatives.

Until a Special Committee was set up in May 2001, consulting the sites of the Federal Senate and the Federal House of Representatives did not enable obtaining information that would allow a clear identification of the real conflicts and actors involved in the legislative debate on the policy (**FIGURE 2**).

FIGURE 2 shows a gap in substantive information between 2006 and 2010, but the facts and conflicts that may have occurred during this period are unknown. However, the approval of the Law Bill in the Plenary is an indication, not of inertia, but of possibly having overcome, not necessarily reconciled, the conflicts and difficulties that had occurred until that time.

The analysis of the process of progress through the legislature, as a set of instruments to identify the actors, conflicts and interests proved insufficient[6]. Only in 2010 was it possible to identify the social actors involved in the debate before the PNRS was written on the occasion of a single Public Hearing that occurred throughout the legislative process. Considering that only two months separate this from the approval of the law in the Plenary, one has to wonder whether there already was a consensus, or a majority obtained before the hearing (**FIGURE 2**).

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5 BARBIER, 2002.

6 For further research, there is apossibility of establishing the relations between the congressmen and their support caucuses, which political parties were members and analysis of campaign funding, at the same time as studies about this by PAULO ROBERTO CUNHA, in a Masters' dissertation: *O Código Florestal e os processos de formulação do mecanismo de compensação de reserva legal (1996-2012): ambiente político e política ambiental* (2012, PROCAM-USP).

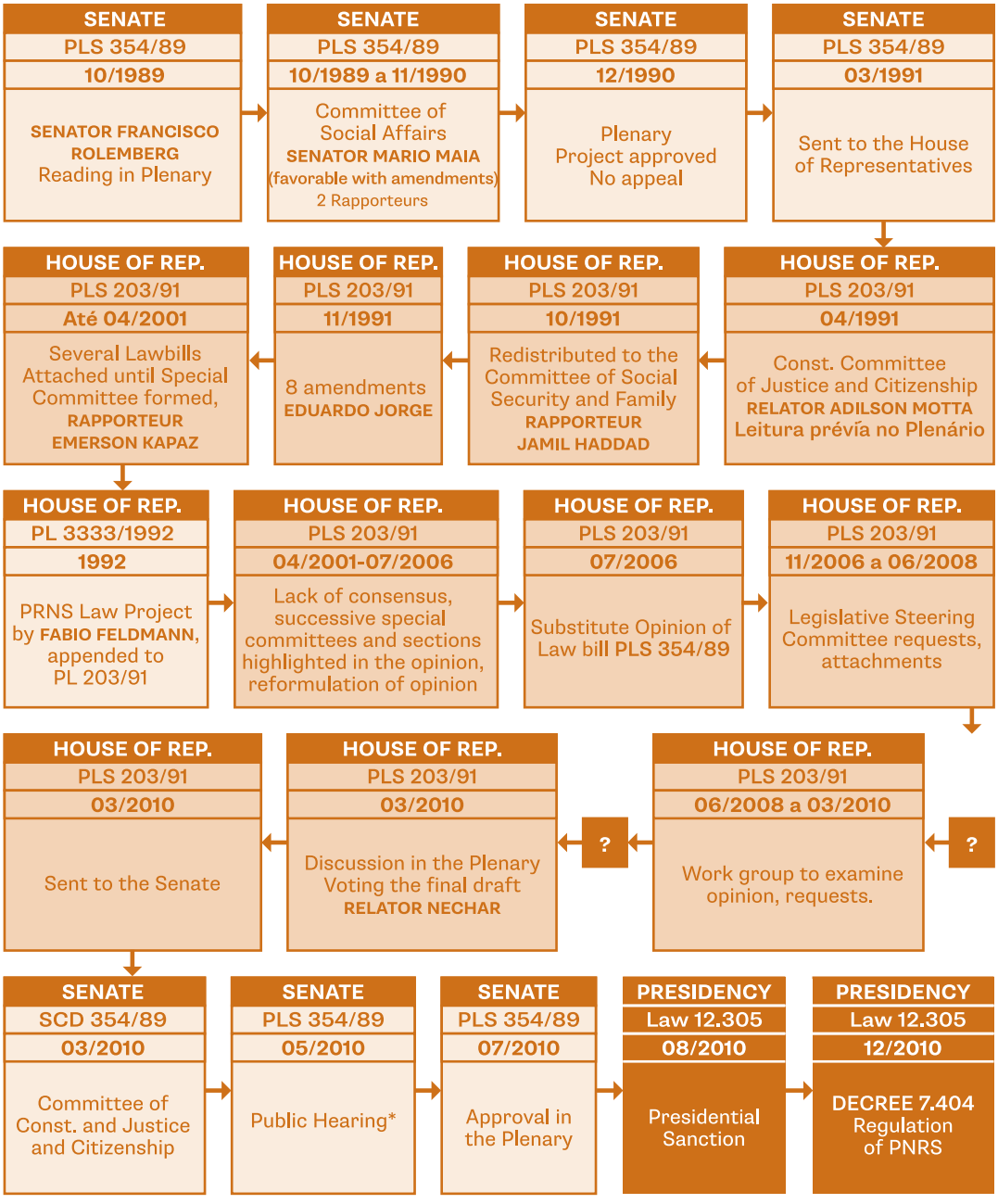

FIG. 2 Legislative process for Law Bill PLS 354/89
* MMA, MCidades, Confederação Nacional dos Municípios, Associação Brasileira da Infraestrutura e Indústrias de Base, Associação Brasileira de Limpeza Pública e Resíduos Especiais, Confederação Nacional da Indústria, Movimento Nacional de Catadores de Materiais Recicláveis.

Two conclusions result from the analysis of the legislative process on the National Policy of Solid Wastes, undertaken by access to the Senate and House of Representatives sites:

(A) insufficiency of substantive public data on the socioenvironmental topics discussed in National Congress, to the detriment fo effective access to information, and

(B) deficiency of the instruments used in this study (examination of the legislative process) to identify the actors and conflicts. There are other possibilities of a survey, such as literature and qualitative interviews. As we shall see below, it was decided to analyze the legal text (Law 12.305, 2010).

READING AND REFLEXIVITY: THE STANDARDS IMPOSED

The difficulty to identify the actors and conflicts involved in constructing the National Policy of Solid Wastes was overcome by choosing a second set of instruments for analysis, present in the analysis of Law 12,305, so that, compared with the previous national scene, the main changes introduced by the policy and its impacts could be identified.

Before the National Policy of Solid Wastes was constituted, the legislative scene involving wastes was as follows:

(A) NATIONAL SPHERE: existence of sparse environmental standards, specific for given categories of wastes (management of health wastes, lubricants, etc.),

(B) STATE SPHERE: existence of Solid Waste Policies in some States of the Federation, such as Ceará (2001), Rio de Janeiro (2003), São Paulo (2006) and Minas Gerais (2009) e

(C) MUNICIPAL SPHERE: competency of the municipalities for the urban cleaning services.

In the National Policy of Solid Wastes, the hierarchy defined for waste management is similar to that of the European Union:

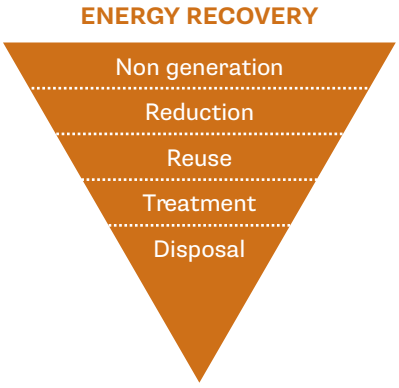

FIG. 3 PNRS hierarchy.

With the PNRS, new socioenvironmental, public and private management, legal and economic scenarios were configured and led to conflicts of interests, especially because of some of the provisos introduced:

(A) Acknowledging the economic value of the solid waste,
(B) Inserting the pickers into waste management,
(C) Sharing responsibility for the product life cycle,
(D) Sectorial agreements,
(E) Reverse logistics,
(F) Management plans,
(G) Economic instruments,
(H) Taxation aspects,
(I) Fiscal, financial and credit incentives, and
(J) Establishing a time by which garbage dumps are to be eradicated.

The conflicts involve a broad range of social actors, such as the Productive sector, Suppliers, Recycling Industry, Public authorities, Pickers, Importers, people and corporate bodies. It should also be mentioend that possible conflicts of interests may exist not only among the actors mentioned, but also internally and in a same group.

The Analysis of the National Policy of Wastes also showed that new concepts and categories were introduced within the sphere of law and management (public and private) demanding that the actors be rendered adequate. Interdisciplinary view, changes in interpretive processes and prevalence of constitutional principles are desired considering the conflicts that will appear in the sphere of each new category introduced by the PNRS.

It should be highlighted, finally, that the law listed as actors who are constituting members of the policy: the public authorities, entrepreneurial sector, manufacturers, importers, tradespeople, consumers, concessionaires of the public services for urban cleaning and solid waste management. However, no mention was made of the citizen, the nuclear political subject who should be addressed by any democratic public policy.

Thus, the National Policy of Solid Wastes does not acknowledge the citizen for what characterizes him intrinsically in the political body, but only as an element in the consumer and disposal relations. There is an institutional "undressing" of the citizen to a figure of a mere individual who will necessarily present in the guise of one of the actors acknowledged by PNRS (manufacturer, consumer, importer...).

Indeed, paradoxically, environmental education is presented as one of the *instruments* for the implementation of politics and *not as one of its constituent elements*, as though the topics treated in the PNRS were limited to management mechanisms.

There was the prevalence of an operational approach to politics and there is a symbolic sense in this picture. However the repercussions go beyond the diegetic field and imply an initial institutional perspective which defines how the successive relationships will be, ignoring the citizens and the ecolological subjects that are being formed (CARVALHO, 2012).

The challenges and overcoming the barriers are reserved to the process of implementing the National Policy of Solid Wastes, by constituting effective public spaces for debate. So far there has been no conclusion.

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THE IMPLEMENTATION OF THE NATIONAL POLICY OF SOLID WASTES (PNRS) IN BRAZIL. THREE YEARS AFTER IT WAS SANCTIONED — WHAT HAS BEEN DONE AND MAIN CHALLENGES

SILVANO SILVÉRIO DA COSTA

The National Policy of Solid Wastes [*PNRS - Política Nacional de Resíduos Sólidos*] was celebrated when it was sanctioned. It took more than 21 years to go through the Brazilian House of Congress.

Finally, on August 2, 2010, President Lula da Silva sanctioned Law 12,305 of 2010, which became known as the Law of Solid Wastes.

At the PNRS sanctioning ceremony, the President recommended to his staff that the Law be regulated still in 2010. On December 23, 2010, approximately four and a half months after it was sanctioned, Decree 7,404 of 2010 was published, with its regulation. Few laws in this country have been regulated in the same year that they were sanctioned.

Well, three years after it was sanctioned, we noted great advances regarding the PNRS implementation, but there are still many challenges.

After it was regulated, the Ministry of the Environment, which coordinates the PNRS in the Federal Government, instituted two important institutional spaces. The Steering Committee of Reverse Logistics [*CORI- Comitê Orientador da Logística Reversa*] and the Interministerial Committee for the implementation of the PNRS, in the months of February and March 2011.

The year of 2011 was very fruitful.

CORI prioritized five chains to implement Reverse Logistics (plastic packaging for lubricant oils, packaging in general, electric and electronic appliances,

discarded fluorescent lamps and medications), created five Thematic Work Groups [*GTT- Grupos de Trabalho Temáticos*] to elaborate the official notice to call for Sectorial Agreements and provide CORI with information to perform specific economic-financial feasibility studies, besides several other important deliberations.

The Interministerial Committee [*CI- Comitê Interministerial*] disseminated a preliminary document on the National Plan of Solid Wastes, performed regional public audiences, and presented it for Public Consultation. It created Work Groups [*GTs-Grupos de Trabalho*] composed by members of Government and of civil society to provide the CI with the normative instruments foreseen in Decree 7,404, of 2010.

Besides taking steps to elaborate the National Plan of Solid Wastes, the Federal Government, through the Ministry of the Environment and the Ministry of the Cities created a Program to support states and municipalities in writing their state, municipal and/or intermunicipal plans.

In 2012 The Federal Government signed the first Sectorial Agreement — The Sectorial Agreement on the chain of Plastic Packaging for Lubricant Oils; it continued to support states and municipalities, helping them elaborate their plans; it published the official notices calling for the Reverse Logistics of Packaging in General, and for Fluorescent, Mercury and Mixed Lamps; and it announced the proposal for the National System of Solid Waste Information [*SINIR - Sistema Nacional de Informações de Resíduos Sólidos*].

On August 2, 2012, the first date of the PNRS expired. From this day on, the States and Municipalities that ask the Federal Government for funds for Solid Wastes must present their Integrated Management Plans for Solid Wastes according to the terms of Law 12,305, of 2010, and its regulation, and of Law 11,.554, of 2007, and its regulation. Although the time was up, few municipalities and states elaborated their plans.

In the last 10 years the pickers of recyclable and reusable materials have been highly valued by the Federal Government, through their companies and related businesses. This valuing is expressed in the PNRS which prioritizes the participation of pickers in the different instruments. There are several Programs to train and instrumentalize the recyclable and reusable materials in selective collection work, supported by the Federal Government, a few states and municipalities.

The year of 2013 is dedicated to continuing the program to implement Reverse Logistics in the other chains and to hold the 4th Conference on the Environment, whose theme chosen by the Ministry of the Environment was the implementation of the National Policy of Solid Wastes with municipal, state and local stages.

The objective of the 4th Conference on the Environment was to discuss, in the three federal spheres, the main actions and responsibilities, not only of the municipal power but also of the private sector and civil society, which also have their responsibilities defined by the PNRS.

Despite the ongoing initiatives, there are many challenges for the implementation of the PNRS throughout Brazil.

Outstanding is the need for the Federal Government to sanction the National Plan of Integrated Solid Waste Management; States and Municipalities must also elaborate their Plans and promote associated management, by means of intermunicipal or interfederative consortia; the garbage dumps are to be eliminated by August 2, 2014 (according to PNSB 2010, most Brazilian muncipalities dispose of their wastes in dumps or in controlled landfills); selective collection is to be expanded to include the pickers of recyclable and reutilizable materials, in harmony with the reverse logistics (according to the PNSB 2010, less than 2% of the solid wastes collected are managed by means of selective collection in the municipalities.).

Great efforts must be made by all parties involved in implementing the PNRS (public authorities, private sector and civil society) so that it will be valued and become a major instrument to promote social, eonomic and environmental sustainability.

SOLID WASTE: THE INCREASING JUDICIALIZATION OF THIS MATTER

FABRICIO DORADO SOLER
PATRICIA VICENTE DE PAULA KODAIRA

The National Policy of Solid Waste is, at national level, the the main legal framework for the laws on wastes in Brazil, since it establishes a juridical system to which every person or entity must submit, whether public or private, those that are directly or indirectly responsible for the generation of solid waste and those that carry out activities involving integrated management or solid waste management.

Thus the juridical discipline on waste affects commerce, because wastes are acknowledged to be an economic good, that can be sold; society, both the public and private sector, in establishing shared responsibility which implies individualized but interlinked duties, imposed on each of the economic agents involved in the life cycle of the products, where on the one hand it is necessary to ensure the return of packaging wastes to the business sector after use, and on the other the reuse of these materials in the productive cycle or their final environmentally appropriate disposal.

In view of the guardianship over the environment, the increase of legal instruments to deal with solid wastes has led to an increase in the number of cases of administrative, civil and criminal liability.

Federal Law nº 12,305, of August 02, 2010, instituted the National Policy of Solid Waste [*PNRS - Política Nacional de Resíduos Sólidos*], covering principles, objectives and instruments as well as guidelines on integrated management

and solid waste management, including hazardous wastes, the responsibilities of those who generate the wastes and the authorities, and the applicable economic instruments.

Subsequently, on December 23, 2010, Federal Decree nº 7,404 regulated the PNRS and created the Interministerial Committee for the National Policy of Solid Waste and the Steering Committee for the Implementation of Reverse Logistics Systems [*CORI- Comitê Orientador para a Implantação dos Sistemas de Logística Reversa*].

Although the PNRS has only recently come into force the judiciary has repeatedly encountered legal proceedings dealing with natters under this Law, involving mainly:

(I) ENVIRONMENTALLY APPROPRIATE FINAL DISPOSAL: disposal of wastes, including reuse, recycling, composting, recovery and energy development, or other destinations which are accepted by the appropriate organs, among which, Sisnama, SNVS and Suasa, final disposal being according to specific operational rules in order to avoid damage or risk to public health and safety and to minimize negative environmental impacts;

(II) ENVIRONMENTALLY APPROPRIATE FINAL DISPOSAL: organized distribution of waste in landfills, according to specific operational standards so as to avoid damage or risk to public health and safety and to minimize adverse environmental impacts;

(III) SOLID WASTE MANAGEMENT: a set of actions undertaken, directly or indirectly, during the stages of collection, transportation, transshipment, treatment and environmentally appropriate final disposal of solid waste and environmentally appropriate final disposal of garbage, according to a municipal plan for integrated management of solid waste or according to the plan for solid waste management;

(IV) REVERSE LOGISTICS SYSTEM: an instrument for social and economic development characterized by a set of actions, procedures and means to enable the collection and restitution of solid waste to the business sector for reuse in their cycle or in other productive cycles or another environmentally adequate final disposal;

(V) SHARED RESPONSIBILITY FOR PRODUCT LIFE CYCLE: a set of individualized and sequential obligations of the manufacturers, importers, distributors and merchants, consumers and public cleaning services and solid waste handling services, to minimize the volume of solid waste and garbage generated, as well as to reduce the impacts on human health and environmental quality due to product life cycles.

Before dealing with judicialization, it is important to briefly touch upon the environmental control instruments instituted by the PNRS and its Regulating Decree, for the purpose of fostering the implementation of this legislation at the managerial level through regular use of police power by the appropriate agencies.

This police power is basically applied by inspection and sanctioning processes, which mostly result in inspection and infraction certification, expert technical report of defaults, warnings, fines, product destruction, workplace or activity shutdown and that of the respective areas, demolition of construction work, partial or total suspension of activities etc.

To this effect, Decree n° 7,04/2010 altered Decree n° 6.514/2008, which establishes the infractions and administrative sanctions on the environment, incorporating conducts and punishment usually linked to inadequate management of solid waste as can be seen in the articles transcribed below:

> *Art. 61. To cause pollution of any nature at such levels that they result or can result in damage to human health or cause the death of animals or significant destruction of biodiversity:* ***Fine from R$ 5,000,00 (five thousand reais) to R$ 50.000.000,00 (fifty million reais)****.*
> *Single paragraph. The fines or further penalties dealt with in this heading will be applied after a technical report drawn up by the appropriate environmental agency, identifying the dimension of the damage caused by the infraction and according to the degree of impact.*
>
> *Art. 62. The same fines of article 61 will be applied upon whoever:*
> *[...]*
> *V – releases solid, liquid or gaseous waste or debris, oil or oily substances outside the conditions stipulated in laws or regulatory acts;*
> *VI –* ***if the person or entity who is to dispose appropriately of products, by products, packaging, waste or substances, when so determined by law or regulatory act does not meet their obligation****;*
> *[...]*
> *IX – discharges solid wastes or garbage onto beaches, into the sea or into any water resource;*
> *X – discharges untreated solid wastes or garbage in the open air, excepting mine tailings;*
> *XI – burns solid wastes or garbage in the open air or in containers, facilities or equipment that has not been licensed for the activity;*
> ***XII – is in default of obligations foreseen in the reverse logistics***

***system set up under Law no. 12,305, of 2010, inasmuch as concerns the specific responsibilities established under said system**;*
XIII – fails to separate solid waste in the format established for selective collection when such collection is instituted by the authority in charge of public urban sanitation and solid waste management;
XIV – assigns solid waste for use in energy recovery in default of § 1 art. 9 of Law n. 12.305, of 2010, and its regulations;
*XV - **fails to keep up to date and available to the competent municipal agency and other authorities, complete information about actions performed in the reverse logistic system under their responsibility**;*
*XVI – **does not maintain updated and available to competent local agency and to the licensing agency of Sisnama and other authorities, complete information on the implementation and operation of the solid waste management plan under its responsibility**; and*
XVII – fails to comply with rules on the registration, management and information foreseen in § 2 art. 39 of Law n. 12.305, of 2010.
§1 The fines referred to in subparagraphs I to XI of this article will be applied after the issuance of an assessment report.
§2 The consumers who fail to comply with their obligations as foreseen in the reverse logistics and selective collection systems will be subject to warning penalties.
§3 In the case of repeat offenses of infractions foreseen in § 2, penalty fines may be levied ranging from R$ 50,00 (fifty reais) to R$ 500,00 (five hundred reais).
§4 The simple fine referred to in § 3 may be converted to environmental quality conservation, improvement and recovery services.
§5 The infractions foreseen in subparagraph IX do not cover activities involved in displacing material from the beds of bodies of water by duly licensed or approve dredging.
§6 The settling basins for wastes or industrial or mining waste rejects, when duly licensed by the Sisnama organ in charge are not considered water bodies for purposes of subparagraph IX.
Single paragraph. The fines dealt with in this article and further penalties will be applied after an assessment report.

Administrative Police Power is a faculty conferred on the Public Administration by law, which limits or disciplines the right, interest or freedom, practice of an act or abstention thereof, because of the public interest concerning the conservation of ecosystems, to the exercise of activities which depend on

concession, authorization/permit or licensing by Public Authority, activities that may lead to pollution or an assault on nature.

As in the case of criminal responsibility, administrative responsibility is characterized by its repressive nature, guilt not being an issue and necessarily involving illicit conduct for it to be seen as an infraction.

In article 225 the Federal Constitution warrants everybody's right "to an ecologically balanced environment, as a good for the common use of the people and essential to the healthy quality of life, imposing on the authorities and the collectivity the duty of defending it and preserving it for the present and future generations. Outstanding among the advances in legislation in the last decades, are the following laws and regulations on waste: Law nº. 9,974/00, which alters Law nº. 7,802, of 11 July, 1989; Law nº. 9.966/00; - Conama Resolution nº. 313/2002, ; Law 7.802, altered by Law 9.974/00.

PNRS is an environmental law that necessarily must address the matter of water resources, public health and other subjects connected to the environment with a very clear social bias in bringing about social insertion through job and income generation, i.e., pickers become important legal protagonists.

Doctrine and jurisprudence already have discussed at length the definitions of the National Policy of Solid Waste, therefore we highlight the decision of the National Conference of Industry, which sought a Direct Action of Unconstitutionality so that Federal Law 5,652/1998, of Espírito Santo, was removed from the legal system.This law forbids the owner of a brand inscribed on containers, vessels or packaging from preventing the reuse of their packaging for the sale of a another product, even by a competitor.

DIRECT ACTION OF INCONSTITUTIONALITY. LAW N. 5.652, OF THE STATE OF ESPÍRITO SANTO. SALE OF PRODUCTS IN REUSABLE CONTAINERS, VESSELS OR PACKAGING. BOTTLED LIQUID PETROLEUM GAS [LPG]. GUIDELINES FOR REQUALIFYING BOTTLES. ALLEGED VIOLATION OF THE DISPOSITIONS OF ARTICLES 5, SUBPARAGRAPH XXIX, AND 22, SUBPARAGRAPH I, OF THE CONSTITUTION OF BRAZIL. NON- OCCURRENCE. THE MEMBER STATE RETAINS LEGISLATIVE COMPETENCE TO DISPOSE ON THE MATTERS OF PRODUCTION AND CONSUMPTION [ARTICLE 24, SUBPARAGRAPH, OF THE CONSTITUTION OF BRAZIL. CONSUMER DEFENSE [ARTICLE 170, V, OF THE CONSTITUTION OF BRAZIL].
1. The allegation of protection of brands and industrial property does not apply. The impugned law makes no dispositions on this matter.
2. The normative text challenged contains guidelines on the consumption of products that are packaged in reusable vessels --- a matter over which

the member-State has jurisdiction to legislate [article 24, inclusion V, of the Constitution of Brazil]. 3. As to Liquid Petroleum Gas [LPG], the impugned law determines that the owner of the brand that is stamped onto the reusable vessel, package or container should not obstruct the free circulation of same [article 1, header]. It establishes that the company that reuses the vessel adequately should identify itself through brand, logo or symbol to ensure clarity. [article 2]. 4. The purchase of gas from the distributor or its retailer implies an Exchange between the gas consumer and the vendor. Gas bottles are interchangeable and laws must be harmonized between the member-states, the Federal District. 6. The Direct Action of Unconstitutionality is considered unfounded.

The juridical matter of waste unfailingly affects commerce, both local and interstate, a definition strictly within the legislating competence of the Union as per article 22, subparagraph VIII of the Federal Constitution. This because, as acknowledged by the National Policy of Solid Waste, they are true economic goods that can be marketed both nationally and internationally.

Condomínio Centro Empresarial Brasília entered a Bill of Review in the Supreme Court against the Federal District, seeking the unconstitutionality of the rates charged exclusively for public services of collection, removal, treatment and disposal of garbage or waste from real estate under the terms of Binding Precedent nº 19 of the Supreme Court [STF].

EXTRAORDINARY APPEAL – CHARGES INCIDING EXCLUSIVELY ON PUBLIC SERVICES OF COLLECTION, REMOVAL AND TREATMENT OR FINAL DISPOSAL OF GARBAGE OR SOLID WASTE – DEMANDABILITY OF SUCH A TAX SPECIE – BINDING PRECEDENT No. 19 – APPLICABILITY IN THIS CASE – APPEAL NOT GRANTED

According to Binding Precedent no. 19[1] the rate charged exclusively for the public services of collection, removal and treatment or destination or garbage or building waste in view of their right to police does not violate article 145, II of the Federal Constitution, which establishes that the Union, States and the Federal District may institute rates for effective or potential use of specific divisible services to the taxpayer or placed at their disposal.

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[1] PSV 40- Dje nr. 223/2009 0 Tribunal Pleno de 29/10/2009 – DJe nr 210, P. 1 on November 10, 2009 – DOU de 10/11;2009, P. 1.

Power Manutenção e Serviços Ltda. appealed demanding the revision of an Assessment against it, which subsumed the conduct of the company in the dispositions of art. 79 of the Regulation of State Law n° 997/1976 of São Paulo, approved by State Decree n° 8.468/1976, that foresees fines for not presenting a full plan for discharging solid, liquid or gaseous waste as well as for failure to present explanations when so requested by CETESB[2].

> CIVIL AND ENVIRONMENTAL PROCEEDINGS. APPEAL REFERRING TO GROUNDS OF SENTENCE: VIOLATION OF ARTICLE 514 OF THE CPC. NON-OCCURRENCE. ENVIRONMENTAL FINE ANNULMENT. RE-EXAMINATION OF EVIDENCE, BINDING PRECEDENT 7/STJ
>
> *1. Hypothesis in which the appealed sentence recognized the Assessment since should information not be supplied when requested by Cetesb the party subsumes itself on the disposition of art 79 of State law 997/1976 that disposes on the application of fines for non-presentation of additional information or a plan for discharging liquid, solid or gaseous waste.*
> *2. There is no infringement of art. 514 of CPC, if the Appeal is based on the arguments of the rebuttal confronting them with the sentence. STJ precedents.*
> *3. Review the finding of the court of origin that an infraction of said state legislation was configured, since the claimant did not in effect supply requested information as found in reviewing the finding of the original court in which the state legislation was found fitting. Under Finding 7/STJ.*
> *4. Appeal denied.*

Associação Brasileira de Bebidas - ABRABE[3] presented a suit against the Municipality of Rio de Janeiro requesting that its members be vouchsafed the right to produce and market alcoholic beverages in PET vessels, such authorizations being extended to the points of sale to the consumer without the restrictions of Law nº 5.179/2010, that forbids the distribution and sale of alcoholic beverages in PET plastic vessels, applying sanctions.

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[2] Agravo Regimental no Agravo de Instrumento – AGA n° 200901774780. Superior Tribunal de Justiça. Julgado em 23/03/2010, DJe 27/04/2011.

[3] Processo n° 0412 388-13.2010.8.19.0001. 13ª Vara da Fazenda do Tribunal de Justiça do Rio de Janeiro.

Therefore, a municipal law that increases environmental protection is formally constitutional. What remains to be seen is if this law is reasonable. [...] It is well known that a large volume of beer and other alcoholic beverages is sold in Rio de Janeiro. One need only walk around the city to perceive that beverages are sold everywhere, and being a tourist oriented society there are many bars and restaurants Therefore authorizing the sale of alcohol beverages in PET bottles would greatly increase the volume of material discarded by consumers. [...] As to the need for Law 5,179 of 2010, it can be verified that there is no other less strict way to achieve the same results. [...]. As to the proportionality, strictly speakinig, it is found that the conflict of interests occurs regarding costs [...]. On the other hand in the case of forbidding the sale of alcoholic beveraages in PET vessels, the cost will be the difference between the price of the aluminum and the PET vessels, and it will be passed on to the consumers of alcoholic beverages.. Thus the good that is to be protected (the environment of Rio de Janeiro) is more relevant than the small price difference to be paid by the consumers. Therefore, repeal of the prohibition of the sale of alcohol beverages in PET vessels without paying fines is without basis. Due to which I JUDGE the initial request to be considered without merit according to art. 269, subparagraph. I, of CPC. No costs, no fees. File it.

Public Civil Action[4] against Bética Coml/ Importadora e Exportadora Ltda., due to the inadequate disposition of unusable automotive tires in violation of CONAMA Resolution n° 258/99, that regulates that the companies manufacturing and importing tires be obliged to collect and dispose of the used tires on national territory in an environmentally appropriate manner.

ENVIRONMENTAL LAW. PUBLIC CIVIL ACTION. UNUSABLE TIRES. CONAMA RESOLUTION N. 258/99. LACK OF PROOF OF ADEQUATE DESTINATION TO IBAMA. ENVIRONMENTAL DAMAGE ESTABLISHED. OBJECTIVE RESPONSIBILITY. INDEMNIFICATION FOR MORAL DAMAGE. MEANS OF COMPLIANCE. REDUCTION OF DEFENDANTS POSSIBILITY NOT ACCEPTED AND CLAIMANT'S APPEAL PARTIALLY ACCEPTED.
– This is a public civil suit with a request for anticipation of guardianship in which the claimant alleges having filed and penalized the defendant company for the inadequate destination of automotive tires no longer

[4] Apelação Cível nº 1494204. Tribunal Regional Federal da 3ª Região. Publicado no e-DJF3 em 14/01/2013.

in use as such a situation which presents serious risks to the environment and human health. It states that the defendant should be held responsible for the moral and environmental damage it has caused. The essential matter to be solved is in regard to discrepant information on tires adequately disposed of by the defendant. In its appeal, the defendant categorically states it complied with all the determinations of Resolution 258/99 and that it only was not possible to prove its acts due to the unjustified refusal by the environmental authority to receive its documents. Moreover, it vouchsafes that the lack of proof before the environmental agency is, in this case, justified, since the decision based on an injunction authorized it to import tires without a previous demonstration of disposal to IBAMA. Article 6 of the CONAMA Resolution determines that proof before IBAMA of the effective number of tires duly disposed of should be presented as per art. 3 which will enable the Foreign Trade Operations Department [DECEX - Departamento de Operações de Comércio Exterior] to authorize importation. Bética Ltda. did not show compliance with the Resolution since it had a judicial decision exempting it. However the decision in MS 2002.51.01.014707-5 only established that DECEX should authorize clearance of the shipment without awaiting IBAMA authorization. There was no question of the claimant being allowed to ignore the dispositions of Resolution 258. Therefore, IBAMA once more filed suit, with good reason. There being damage, and such damage being intimately related to the company's behavior it remains to establish the value that should be established for reparation. The indemnification for moral damage, unlike that for patrimonial damage considers a series of linked factors such the affected party, in this case the collectivity, but considers a series of factors, reproof of conduct and the reiteration or repetition of the event, the possibility of making the infractor acquire a conscience to avoid future environmental damage, the size of the company and other elements. On the other hand, in setting the amount of damage, the judiciary must avoid generation of illicit enrichment by the claimant condemning the defendant to indemnification of excessive or disproportionate values of the activities of the sanctioned company and that the level should be in accordance with the company assets, whereby I find the amount of R$ 100.000,00 (one hundred thousand reais), to revert in favor of the fund established in article 13 of Law nº 7.347/85. – As to the fine I maintain it as being commensurate with company assets according to precepts of the Superior Tribunal de Justiça in that it should not cause the company activities to be restricted. Appeal by the defendant which is denied and appeal by the author which is partially accepted.

Considering the guardianship over the environment and public health, the resolution above was pioneering in post-consumption responsibility. Non-compliance may lead to administrative, civil and criminal charges against the offender.

Before this rule, Decree 875/93 was published, which reduces import/export of hazardous waste, potentially damaging to the environment, to minimal levels compatible with an efficient environmental management of such wastes. At present used tires may no longer be imported.

The public prosecutor has filed a Public Civil Action[5] against Osram do Brasil Companhia de Lâmpadas Elétricas Ltda., General Eletric do Brasil Ltda., Philips do Brasil Ltda., Sadokin Eletro Eletrônica Ltda. and Sylvania do Brasil Iluminação ltda., demanding that they implement a reverse logistics system in which they promote the collection, storage and final disposal of used fluorescent lamps produced by them and consumed in Rio Grande do Sul.

BILL OF REVIEW. NON-SPECIFIC PUBLIC LAW. ENVIRONMENTAL LAW. CIVIL PUBLIC ACTION. CONVERSION INTO RESTRAINED APPEAL. PROPRIETY. It is impossible to transform a Bill of Review into a restrained appeal where there is a possibility of irreparable or hard to repair damage, the appellant seeking to alter the decision that allows requests for prior guardianship with ample extension under pain of considerable daily fines. Intelligence of article 522 of CPC, considering version as per Law nº 11,187/05. Precedents of TJRGS and STJ. ANTICIPATED GUAR-DIANSHIP. IMPOSSIBILITY This is a controversial matter involving the possibility of environmental and health damage due to the discarding of fluorescent lamps because of the mercury used in them. It authorizes suspension of prior guardianship granted in a public civil action, setting obligations to the manufacturers under pain of considerable daily fines. Absence of verisimilitude of allegations in view of proof existing thereby impeding guardianship to run out. State Laws nº 11,019/97 and 11,187/98. Precedents of TJRGS. INVERSION OF THE BURDEN OF PROOF. PROPRIETY. The inversion of the burden of proof is authorized considering objective responsibility the manufacturer having to prove that the activity does not cause damage to the environment. Application of § 1 of art. 14 of Law nº 6.398/81. Precedents of TJRGS. Appeal partially conceded by majority.

[5] Agravo de Instrumento nº 70017784208. Tribunal de Justiça do Rio Grande do Sul. Julgado em 01/03/2007.

The actors involved in Reverse Logistic systems disciplined in the National Policy of Solid Waste play an important role, and it is one of the responsibilities in the adequate management of waste as of the return of products, reduction at source, recycling, substitution of materials, reuse of materials, disposal of waste, reforming, repairing and remanufacturing.

On the national scene the reverse logistics of lamps is not much developed and structured, which is a great environmental concern, especially regarding fluorescent lamp discards, considered a hazardous waste since they contain toxic substances such as mercury, which can contaminate soil and water.

Gladson José Dantas Campelo[6] and others were indicted for the crime of pollution for discharging solid, liquid or gaseous waste in default of the rules of art. 54, §2, V, of Law 9.605/98, that establishes the criminal and administrative sanctions stemming from conducts and activities that are deleterious to the environment and offers other actions. It specifically sanctions conducts that result or may result in harm to human health or that cause death of animals or significant destruction of the flora, foreseeing qualified types in the case of water resource pollution that causes the public supply of water to be suspended in a community and when it occurs due to the discharge of solid, liquid or gaseous waste, or debris, oils or oily substances, against the requirements established by law or regulation.

> *CRIMINAL. CRIMINAL PROCEEDINGS. CRIME AGAINST THE ENVIRONMENT. POLLUTION. DISCHARGE OF LIQUIDS (EFFLUENTS) 54, §2, V, OF LAW 9,605/98. CONAMA. RESOLUTION Nº 20. EXPERT EVALUATION REPORT INDISPENSABLE. ART. 397, III. CPP. SUMMARY ACQUITTAL. 1. In order to characterize a crime of pollution by discharging solid, liquid or gaseous waste in disagreement with the rules of art. 54, §2º, V, of Law 9.605/98, an expert report must be issued so that the quality and quantity of the effluents discharged can be determined. 2. If after the presentation of the answer foreseen in art. 396-A of CCP, it is established that the fact described effectively is not a crime the judge must acquit the accused under art. 397, III, of the Brazilian Criminal Process Code. 3. Appeal not justified.*

CONAMA Resolution 357, of March 17, 2005, also disposes on the classification of the bodies of water and environmental guidelines for their framing as well as establishing the conditions and standards for effluent discharge and

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6 Apelação Criminal nº 200533000107122. Tribunal Regional Federal da 1ª Região. Publicado no e-DJF1 em 03/04/2012.

established in article 24 that: Effluents of any nature can only be discharged directly or indirectly into bodies of water after due treatment and as long as they comply with conditions, standards and demands disposed by the Resolution and other applicable rules.

At a civil level whoever causes environmental degradation can be condemned judicially to repair environmental damage as well as be obliged to do and not do things required for ceasing activities that are damaging to the environment.

The municipality of Conceição da Barra appealed an indictment[7] against the issuing of an Assessment and Interdiction in which the municipality is cited for maintaining a sanitary landfill without authorization from an environmental agency.

> *ADMINISTRATIVE. USE BY THE MUNICIPALITY OF CONCEIÇÃO DA BARRA, OF SANITARY LANDFILL WITHOUT THE APPROPRIATE ENVIRONMENTAL LICENSE – Claiming party, Municipality of Conceição da Barra against indictment due to assessment and Notice of Infraction and Attachment Order/Interdiction for maintaining a sanitary landfill without environmental license. They also declare that they collect domestic garbage and deposit it in an area obtained by donation, this area being more than seven kilometers from the nearest inhabited place They state that they signed a Protocol of Intent with IEMA but are awaiting the drawing up of the Term For Conduct Adjustment and in the meantime continue to dump garbage in the area discussed. II – The Honorable Court a quo acknowledged the legality of the Notice of Infraction but declared the interdiction without effect since the Municipality has nowhere else to deposit urban garbage. III – It is understood that that the solution of the garbage problem in Conceição da Barra must take into account the rea-lity, that this is a small unit of the Federation, without budget resources to immediately hire a private organization to dispose of solid waste in an environmentally correct manner. IV – However it is unacceptable that the municipality continue to use this landfill without environmental licensing for an undetermined time. V – Therefore the most reasonable solutions as recorded by the Regional Attorney General of Brazil is that a maximum time period for compliance be established while a solution is found. VI required filing and IBAMA appeal partially supported.*

[7] Apelação Cível nº 200750030001331. Tribunal Regional Federal da 2ª Região. Publicada em 04/11/2010.

According to the National Policy of Solid Waste, the open air disposal of waste, known as landfill, is no longer acceptable. This practice of irregular final disposal takes place without previous soil preparation, liquid efluent disposal system and consequently attracts insects, rodents and has a high risk of contamination.

Instituto Educa Brasil appealed the suit [8], to keep Brasil Terminal Portuário from going ahead with the port facilities without treating the contaminated area where the terminal was to be installed.

> *CIVIL PROCEDURAL LAW. ENVIRONMENTAL LAW, INTERLOCUTORY APPEAL, INNOMINATE INJURY, PUBLIC CIVIL CASE INOMINATED APPEAL, PUBLIC CIVIL CASE. INSTALLATION OF A PORT, ENVIRONMENTAL PERMISSION OF PARTS OF THE WORKS BEFORE COMPLETE DECONTAMINATION OF THE AREA, PARTIAL LICENSES FROM CETESB, IBAMA LICENSE FOR PARTIAL INSTALLATION, NEED TO SHOW FAULTY INSPECTION. TERM OF COMMITMENT TO ADJUSTMENT OF CONDUCT, (TCAC-Termo de Compromisso de Ajuste de Conduta). IMPUGNED ACTS PRACTICED BASED ON TCAC, CLAIM TO DECONSTITUTION. LACK OF PROOF OF CONTENT, NEED TO ATTACH THIS DOCUMENT, REQUIREMENT TO INCLUDE STATE PROSECUTION IN THE CASE, APPEAL FOUND WITHOUT MERIT. 1. Damage to the environment has taken place in the area for decades and there is a need for environmental recuperation. 2. BTP is appointed as responsible for presenting "an environmental study that delimits the contaminated area and the contamination plume, establishes the degree and type of contamination; for remedial action in area; in the contaminated area according to the uses proposed, with the identification and delimitation of the ares to be used and the ares to be preserved (based on the type of vegetation; based on their importance for the recoverym protection and conservation of nesting areas; based on the fact that it is an area for permanent preservation); indicate the mesures neeeded for recovery, protection and conservation and protection of the areas to be preserved; and indi-cate the measures required for preservation and for compensation of damage that has been effected." 3. This preliminary adjustment has therefore only involved carrying out studies on damage to the environment and proposals for remedial action of recuperation of the environment,*

[8] Agravo de Instrumento nº 00173099220124030000. Tribunal Regional Federal da 3ª Região. Publicado em 04/03/2013.

enabling future Terms of Adjustment, (TCAC) and only then defining specific means for environmental recovery. 4. [...] 5. Claimant alleges that BTP presented "an environmental impact study" to IBAMA and CETESB undertaking to only build the port terminal after full decontamination of the area through soil washing and discarding only a small part this material at a specific place; (B) however during the process of soil remediation it modified the method to a less expensive one that was more damaging to the environment, i.e., the mere excavation and transfer of the contaminated material to another location; (C) began the construction of parts of the port terminal by obtaining an Installation Permit (IP) from IBAMA, which authorized the beginning of the work by lots, whenever they were authorized by CETESB/ (D) however the work was only supposed to begin when the full area had been decontaminated and certified by CETESB through a "Term of Rehabilitation of the Area for Declared Use, at the end of the process of rehabilitation. 6. [...] According to the documents attached to the process there had been a "Term for Conduct Adjustment (TCA) where procedures, responsibilities, objectives and measures were specified for decontamination which were used by IBAMA to issue the IP, with permission to begin work on part of the port without issuing the "term of rehabilitation of the area for a declared use" by CETESB. 7. The claimant actually wishes, despite strictures placed by BTP, CODESP, IBAMA and CETESB, to annul this "Term of conduct Adjustment" established within the scope of the State Attorney of São Paulo, without the slightest testing for facts that would permit the construction to begin by stages after express or tacit releases by CETESB. 8. [...] 18. As has been seen, CETESB stated that BTP carried out all the work required and achieved the cleanup remediation defined, and that the site was monitored thereby the requirement for the installation of the enterprise have been met. There is no illegality found here. 19. There are no facts that could be detrimental to the claimant if shown that CETESB did careless examinations of the site, without an effective analysis from time to time as per law. [...] 20. The lease contract esta-blishes that the leaser must decontaminate the area and CODESP must inspect it. 21. This requirement appears to have been met since the monitoring agency has found that after remedial activity the contamination has been found to be at acceptable levels and simply that monitoring should proceed for a few semesters. Action unmerited.

The municipality of Bezerros appealed a decision of Civil Public Action nº 0001383-40.2012.4.05.8302 [9], that determined that the Municipality should abstain from dumping garbage and further waste for 04 (four) months anywhere that is not declared a sanitary landfill by CPRH and condemned it to present a filing protocol for projects for permanent landfill and the license request to CPRH within 05 (five) months. Failure to comply carries a daily fine of R$ 1,000.00 (One thousand reais).

> *APPEAL. IBAMA, CIVIL PUBLIC ACTION. INJUNCTION GRANTED STIPULATING FIVE MONTHS FOR THE MUNICIPALITY TO ARRANGE FOR THE CREATION OF A SANITARY LANDFILL. EXCESSIVELY SHORT PERIOD OF TIME INITIATIVES ALREADY UNDER WAY. GRANTED. I – The matter under discussion is the suspension of an injunction forbidding the municipality from dumping garbage, rubble and other wastes of this kind during 04 (four) months in a sanitary landfill that is unlicensed by CPRH, as well as enjoining it to present in 5 (five) months proof of filing projects for permanent landfills and the request for environmental licensing from CPRH and stipulating a daily fine of R$ 1,000.00 (Thousand reais) for noncompliance. II - Although the response by the claimant municipality does not represent an immediate response to society's demands the short time allowed to resolve the problem does not appear justified. In fact, it is not to be believed that the county will manage to face all the challenges of creating a sufficiently large landfill within the time stipulated. III – It is important to underline the fact that the decision under appeal does not even mention the fact that the municipality had already begun studies to solve the problem. In fact, on the contrary. In consultation held on the site by the Federal Justice of Pernambuco the records showed that the judge only was informed of such actions by the municipality after issuing the injunction therefore compromising the decision, which was taken without the magistrate having been informed as to all the issues. IV – There is definitely relevant information leading to the conclusion that the municipality was carrying out measures to solve the problem of dumping solid wastes, which at least for the moment would mean no such short times should be stipulated by the judiciary to foster such complex public policies. V – Appeal conceded.*

[9] Agravo de Instrumento n° 00109654120124050000. Tribunal Regional Federal da 5ª Região. Publicada em 29/11/2012.

Glacy Olsen, Avani Olsen, Lari Schneider and Neri Trentini, filed an Action for Indemnification for Material/Patrimonial Damage [10] plus Moral Damage against Couros Bom Retiro Ltda. and Adelar Gugel, due to unauthorized contamination of an area under an agricultural partnership contract.

> *CIVIL RESPONSIBILITY, AGRICULTURAL PARTNERSHIP c CONTRACT, INCORPORATION OF SOLID INDUSTRIAL WASTE. AREA CONTAMINATION, INDEMNIFICATION. The placement of solid industrial waste on land must be preceded by an environmental license and the proprietor's permission. In this case, there was no agreement by the proprietor and expert survey showed that this caused soil contamination and damage. In establishing the value of the indemnification for material damage and liquidation, the circumstances of the original petition must be considered. In this case, the illicit act did not revert upon the claimants. The appeal of claimants is partially approved. Appeal by defendants not accepted.*

The obligation to right damage to the environment is propter rem, in which the person acquiring a land property that has been deforested or an industry that discharged pollutants into the environment must repair such environmental damage even if these were caused before the purchase. All activity with potential for damage to the environment must be licensed by the proper environmental agency.

The Public Prosecution filed a Public Civil Action [11] against Ecolider Sistema Ambiental, with a view to banning use of the company premises since the environmental protection agency had vetoed the operating license.

> *BILL OF REVIEW. PUBLIC CIVIL ACTION. INJUNCTION ESTABLISHING THE INTERDICTION OF AN ESTABLISHMENT STORING SOLID WASTE. NO ENVIRONMENTAL AGENCY ISSUED OPERATING LICENSE.*
> *The action has been dragging on since September 2011, the Public Authority demanding that the defendant obtain environmental licensing for storage operations of solid waste, a potentially pollutant activity that causes bad odors in the neighborhood. The appellant maintains two establishments, neither having an operating license issued by the environmental Agency. One establishment effects effluent*

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[10] Apelação Cível nº 70054524582. Tribunal de Justiça do Rio Grande do Sul. Julgado em 27/06/2013.

[11] Agravo de Instrumento nº 70053894697. Tribunal de Justiça do Rio Grande do Sul. Julgado em 24/07/2013.

transshipments and the other stores solid waste. According to the appellant, one establishment is only an administrative center, which is not borne out by evidence. Everyone has a right to an ecologically balanced environment; this being a common asset of the people and essential for a healthy quality of life, therefore the Public Authorities must demand under the law that facilities or activities potentially degrading the environment present a prior study of environmental impact (art. 225, caput and subparagraph IV of CF). Therefore, the establishment's interdiction is correct until such a time as the claimant obtains an operating license. Appeal denied.

Federal Law no 6,938, of 09/31/i1, on the National Policy for the Environment institutes the system of Environmental Impact Evaluation for activities that modify or potentially may modify the environmental quality by establishing the Environmental Impact Evaluation. The same law institutes the licenses to be obtained throughout the existence of modifying or potentially modifying activities on environmental quality.

The Environmental Crimes Law. 9605/1998, disposes on criminal and administrative sanctions deriving from activities that are damaging to the environment and stipulates penalties for who fails to adopt on demand by the empowered authority precautionary measures of precaution in case of risk of serious or irreparable damage.

The Public Prosecutor's Office entered a Public Civil Action [12] against the companies Microlite S.A., Gillete do Brasil Ltda., Philips da Amazônia Ltda., Panasonic do Brasil Ltda. and Energizer do Brasil S/A – Eveready, with a view to setting up reverse logistics for batteries.

CIVIL APPEALS, ENVIRONMENTAL LAW. PUBLIC CIVIL ACTION JUDGED FOUNDED, UNRESIGNATION SEEKING SENTENCE ANNULMENT, ALLEDGED LACK OF EVIDENCE OF DAMAGE TO THE ENVIRONMENT. DISPOSAL OF BATTERIES. Need for a judicially sponsored technical survey since the one in the proceedings records is unilateral and was specifically impugned by the companies that have been cited, therefore not being adequate as a support to the claim, especially since there is a decision of this Court during the fact finding period in which it became clear that there would have to be proof in the form of a survey, simply inverting the burden

[12] Agravo de Instrumento nº 70053894697. Tribunal de Justiça do Rio Grande do Sul. Julgado em 24/07/2013.

of proof, the defendants being enjoined to present such evidence; Impossibility of applying Law n. 12,305/2010, that obliges manufacturers, importers, merchants and distributors of batteries to implement and structure reverse logistics for the return of these products in detriment to the technical survey since the matter must be judged according to law as current at the time of judgment. APPEALS ACCEPTED. PRELIMINARY CURTAILMENT OF DEFENSE ACCEPTED. SENTENCE VOIDED TO PERMIT TECHNICAL EXPERT REPORT.

On the same matter the Associação Brasileira das Indústrias de Refrigerantes e Bebidas Não Alcoólicas – ABIR [13] (Non Alcoholic Beverage Industry Association) brought suit for Municipal Law nº 13,316 of São Paulo to be held unconstitutional alleging illegality or unconstitutional since there is no way the targets for repurchase a recycling foreseen in the law can be reached within the time allowed.

CLASS ACTION. Capital. LM nº 13.316/02. DM nº 49,532/2008. Administrative Ruling nº 97/SVMA/2008. Repurchase and disposal of plastic packaging. Anticipated guardianship – The simplicity of the rulings and strict time periods to obey repurchase quotas, which have not been achieved anywhere in the world, even with longer terms are convincing arguments for the impossibility of compliance. The serious loss resides in the heavy fines that are foreseen in the law and in the interdiction of the establishment. Anticipated Guardianship denied. Appeal accepted suspending the imposition sanctions foreseen in LM nº 13,316/02 and its regulation (DM nº 49,532/08 and Administrative Ruling a SVMA nº 97/08).

Reverse logistics is an instrument of social and economic development which is characterized by a set of actions, procedures and means to enable the collection and restitution of solid residues to the corporate sector for reuse in their or in other productive cycles, or to be given another environmentally adequate destination.

In the form of a National Policy of Solid Wastes, or in agreements by sector and commitments signed between the public authorities and the entrepreneurial sector, the reverse logistics systems, by returning of products

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13 Agravo de Instrumento nº 70053894697. Tribunal de Justiça do Rio Grande do Sul. Julgado em 24/07/2013.

after use by the consumer, will be extended to products with a priority for taking into account the degree and extent of the impact on public health and the environment by the wastes generated.

The public Prosecutor of the State of São Paulo established a public civil suit against the manufacturers of cell phones alleging that they sell mobile phones and batteries in the country but do not have established collection points for used batteries, which are considered technological garbage and have not supplied information on the disposal of the above wastes.

> *Therefore I consider the action to condemn defendants to maintaining bins for disposal of the cell phone batteries at every establishment in the country where they are sold PARTIALLY JUSTIFIED and within 06 (six) month of this judgment require this to be done, failing which daily fines of R$ 20,000.00 will be found against the defendant not complying. The parties having reciprocally given up their claims, each party will pay costs incurred and their lawyer's fees. Under the terms of Law n.º 11,608/03, the value of a possible preparation for appeal is R$21,315.44, plus remittance and return costs (R$ 29.50 per package) as per Prov. 833/04. P.R.I.C.*

The Public Prosecutor's office has also determined that the defendants must inform the consumers through posters, banners and publicatons about the ills and harm caused by discarding mobile phone batteries in inappropriate places, thereby promoting a campaign for consumer education and environmental preservation, and sentencing the defendants to make available in all establishments on national territory where their products are sold, units to receive the batteries and cell phones.

Law nº 12,305/2010 foresees in its article 33 combined with Subparagraph II, which is specific for batteries, that the importers and manufacturers, distri-butors and marketers of batteries must structure and implement reverse logistics systems for the return of products after use by consumer independently of the urban public cleaning service and the management of solid wastes.

This means that the concept that manufacturers should have battery recovery units throughout the country, wherever their products are sold. This should be in place six month after judgment in court. The time established by courst for the manufacturers to comply with the order is six months, from the time the sentence is issued.

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14 Sentence appealed by: Motorola, Samsung, Nokia and State's Attorney. Appeals were heard on 07/31/2º13. The result has not yet been published.

FINAL CONSIDERATIONS

These are a few examples of the increasing judicialization of the subject of solid wastes, which should continue to grow with the consequences of the National Policy of Solid Wastes, and also other legal and normative instruments that may be published by the state and municipal agencies.

As to environmental issues, it becomes increasingly clear that there is a judicialization as a consequence of the state and municipal rules that aim at increasing the environmental protection established by the federal legislation.

The Judiciary has sought to respond by setting up specialized courts and designating magistrates who have a greater familiarity with the area and can produce more efficient decisions.

PACKAGING AND INFORMATION: THE IMPORTANCE OF ENVIRONMENTAL INFORMATION IN THE ENVIRONMENTAL CHALLENGES OF SUSTAINABLE WASTE MANAGEMENT

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The complexity of solid waste management in Brazil involves a number of factors that should be studied in detail and conjugated. Environmental information plays an important role and it is essential to the different social actors involved in the chain of responsibility for waste management.

Information enables a better evaluation of the alternative forms of solid waste management.

In this context, the present study will discuss a few of the public policies on access to environmental information currently in force in Brazil, with a joint analysis looking at the National Policy of Solids Wastes [*PNRS - Política Nacional de Resíduos Sólidos*], in order to reflect on possible solutions to the challenges inherent to sustainable waste generation in Brazil, especially as regards packaging.

THE RIGHT TO ENVIRONMENTAL INFORMATION

Environmental information is of a technical nature and may present matters ranging from emission and quality standards to technical concepts and study conclusions. Although it is highly complex, it must be clear and easy for anyone

to understand, considering that it provides instruction and capacity-building for the entire community regarding problems, warnings and solutions involving the environment.

The right to environmental information began with the Declaration of Stockholm, of 1972, reaffirmed in the Declaration of Rio in 1992, foreseeing popular participation in dealing with environmental issues and the need for access to information.

Internationally, the Convention of Aarhus, 1998, is outstanding. It provides clear rules about environmental information. Among them, special attention should be given to the duty of conveying environmental information, even if the public is not particularly interested. Besides, there is an obligation of giving publicity to the information that involves the environment, independent of commercial or industrial secrecy.

The afore mentioned Convention presents these three pillars and consolidates the bases for exercising a sustained democracy[1], since it foresees the means for citizens to build their capacity by access to environmental information, to exercise their right of speech through instruments of public participation in public decision making, for instance, consultations and public conferences, and to question or even demand their rights to a healthy, balanced environment in court, bringing them into line as true subjective rights.

On the domestic front, the Brazilian legal system did not allow the international evolution regarding environmental issues to go unnoticed. All the way from the Constitutional level, the Federal Constitution of 1988 dedicates an entire chapter to environmental protection, in its art. 225, in which it clearly foresees a healthy and ecologically balanced environment as everyone's right, and its protection as being a duty of the public authorities and the community. The environment also appears as a guiding principle of the Economic Order (art. 170, subparagraph VI), and fundamental law (art. 225).

In Brazil, Law nº 10,650/2003 is the main normative instrument dealing with access to the environmental information held by government agencies, namely that which is in the hands of the agencies that are part of the National System of the Environment [*SISNAMA - Sistema Nacional do Meio Ambiente*].

In other words, the agencies and entities of the direct, indirect and foundational Public Administration, that are part of *SISNAMA*, are obliged to allow public access to their documents, files and administrative proceedings that deal

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[1] Cfr. CANOTILHO, J.J. Gomes. O Estado constitucional ecológico e democracia sustentada. Revista CEDOUA, Coimbra, PP. 9-16, fev. 2001. Similarly, MACHADO, Paulo Affonso Leme. Direito à informação e meio ambiente. São Paulo: Malheiros, 2006, P. 49

with environmental issues, and to supply all the environmental information that is under their responsibility (physical, electronic and sound media, and others).

According to art. 2, §1º, of this Law, no proof of specific interest is required from an individual who wishes to have access to this kind of information, as long as the data involved are not subject to commercial, industrial, financial confidentiality, or any other required by Law. It must, however, be underscored that publicity should be the rule and confidentiality the exception.

In addition, art 4 lists topics that should be published in the Official Gazette and be available at the respective government offices, periodically, such as requests, renewal and concessions of licenses, notice of infraction, and penalties imposed by the environmental agencies, licenses to forbid cutting vegetation, writing terms of adjustment of behavior, records of the presentation of environmental impact studies and their approval or rejection, among others. The *SISNAMA* agencies are also in charge of periodically issuing reports on air and water quality according to the law (art. 8).

However, although Brazilian Law focuses on the environmental information belonging to public agencies, the right of access to environmental information should include all and any environmental information produced by public or private entities, or those belonging to the third sector.

THE NATIONAL POLICY ON ENVIRONMENTAL EDUCATION – LAW 9,795/99

The National Policy on Environmental Education introduced into the legal system of the country by Law nº 9,795/99, is also identified as a normative measure that regulates another kind of access to environmental information, this time not by supplying diffuse environmental information according to the interest of those who request it, but through a process of formal and informal education.

Formal education, defined by law, is what is taught at public and private schools by introducing the topic of the environment in its own place in the curriculum schedule.

Informal education, on the other hand, occurs through public awareness-building campaigns among the population about the environmental benefits and losses derived from their conduct.

According to the Federal Constitution of Brazil, article 225, §1, VI, it is the responsibility of the Government to "promote environmental education at all school levels and the public awareness of environmental preservation".

> *"On the other hand, Federal Law 9,795, of April 27, 1999, rules on environmental education and institutes the National Policy of Environmental Education. Among its basic principles is the concept of the environment as a whole, considering the interdependence between the natural enviroment and the socioeconomic and cultural ones from standpoint of sustainability."* (*free translation* MACHADO, 2010, P. 154/155)

Through environmental education, the individual and the community construct social values, knowledge, attitudes and competencies aimed at conserving the environment and at sustainability. It is, therefore, an essential and permanent component of national education, and should be present in an articulated fashion in the educational process, formally and non formally, and it is the right of every person.

The aforementioned Law expands the list of people responsible for promoting environmental education.

Besides the public authorities who, according to articles 205 and 225 of the Federal Constitution should promote public policies that incorporate the environmental dimension and the promotion of environmental education at all levels of education, other actors are equally responsible for promoting environment education.

Outstanding among them are the educational institutions, the agencies belonging to the National System of the Environment, the mass media and businesses.

Environmental education must be considered as a mechanism that disseminates environmental information essential to construct a sustainable society. In this sense it is extremely important that the promotion of this information take place through various actors, both public and private, in a form appropriate to the different recipients.

In the corporate environment, environmental education must not be promoted only to comply with a legal duty, on the contrary, supplying adequate information and training helps achieve productive gain and the so often mentioned cleaner production.

Looking at the issue, companies strategically began to adopt a new management model for their production, incorporating the search for environmental quality into their activities. Thus, Environmental Education

began to play an essential role in businesses – the training and awareness building of the employees.

It is observed that, with access to adequate education, all participants in the production chain begin to understand the intelligent use of natural resources, and the result ranges all the way from reducing environmental infractions to the adequate final disposal of of wastes. Environmental Education becomes an essential tool for awareness building and qualification of the company employees, reflected in a change of behavior and attitudes about the environment, inside and outside the organizations.

Increasingly the businesses show that growth is closely attrached to the image they project. This leads to increased concern about ethical principles that guide their managements. Outstanding among them are mainly socioenvironmental actions.

The environmental education programs ultimately generated economic advantages for the businesses, expressed in the reduced consumption of energy, water and raw materials. Finally, adequate environmental management of the production processes and training of employees result in advantages for obtaining environmental Stamps and Certificates.

On the other hand, the government must contribute to applying environmental education through public policies that will supply information about the modelos of access and usufruct of the natural lresources, the property regime of the resources, trhe existing technological options, besides the legal instruments available to the population.

According to the National Program on Environmental Education [*PRONEA- Programa Nacional de Educação Ambiental*] established by the Ministry of the Environment and the Ministry of Education of Brazil - so that the action of the government in the field of environmental education may enable the articulation between the existing initiatives in the field of education and actions for protection, recovery and socioenvironmental improvement, it is necessary to fomulate and implement public policies of environmental education that will strengthen this transversal perspective[2].

The environmental education promoted both by the government and by private entities and by the third sector, should stimulate interdisciplinary dialogue between the sectorial policies and popular participation in the decisions on investments, monitoring and evaluation of the impact of such policies.

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[2] Ministério da Educação. ***Programa Nacional de Educação Ambiental – PRONEA***, 3ª edição. Brasília, 2005. Available at<*http://portal.mec.gov.br/secad/arquivos/pdf/educacaoambiental/pronea3.pdf*>. Accessed on: July 11 2013.

Thus, among the objectives of applying environmental education, there is the challenge of creating conditions for the political participation of all social segments and of the population in its different social classes, both in formulating public policies, and in applying environmentally adequate measures.

WASTE MANAGEMENT FROM THE PERSPECTIVE OF THE NATIONAL POLICY OF SOLID WASTES (PNRS)

So far we have discussed two essential public policies regarding environmental information, one that allows citizens access to all and any means of environmental information in order to enable the democratization of environmental issues; another that contributes to education of the current and future generations, rooting the environmental issue as a cultural aspect.

In the specific context of solid waste mangement, environmental information also plays na important role. It is considered that because the matter presents technical and logistic variables, its regulation through the National Policy of Solids Wastes [*PNRS*] was essential to ensure the participation of the different sectors of society in the environmentally adequate management of this class of wastes.

After almost two decades going through the Brazilian Congress, Law nº 12,305/2010 introduced the National Policy on Solids Wastes into the Brazilian legal system. Despite taking so long in congress the Law can be considered innovative, since it institutes not only a national legal framework for the appropriate management of wastes in the country, but it also provide economic, legal and administrative instruments, besides individual rights and duties for each risk manager within the production and consumption chain.

PNRS, influenced by the European Framework Directive on wastes, adopted the principle of the hierarchy of wastes, that establishes an order of priorities for the management and prevention of the generation of solid wastes.

In this context, in art 9, *caput*, the *PNRS* establishes the following priority for solid waste management:

(1) non generation;
(2) reduction;
(3) reuse;
(4) recycling;
(5) waste treatment;
(6) environmentally adequate final disposal of rejects.

Besides these six hierarchical levels, in § 1 of the aforementioned provision the possibility is foreseen of using technologies to recover energy from urban solid wastes, as long as their technical and environmental feasibility has been proved and the toxic gases emission monitoring program approved by the environmental agency has been implemented.

According to art. 3, XVIII, of the *PNRS*, "reuse" means *"process of using the solid wastes without their biological, physical or physicochemical tranformation, as long as the conditions and standards established by the appropriate agencies are obeyed"*.

On the other hand, "recycling" is defined, in art. 3, XIV, of the *PNRS*, as the *"process of transformation of solid wastes which involve the alteration of their physical, physicochemical or biological properties, for the purpose of transforming them into inputs or new products, as long as the conditions and standards established by the appropriate agencies are met"* in the case of *SISNAMA*, the National System of Sanitary Surveillance [*SNVS - Sistema Nacional de Vigilancia Sanitária*] and the Unified System of Agriculture and Livestock Health [*Suasa - Sistema unificado de atenção a Sanidade Agropecuária*].

Another alternative to disposal, foreseen in arts 3, VII, and 36, V of the *PNRS*, applicable especially to the organic wastes is composting. Basically, composting could be seen as a form of recycling insofar as the organic materials begin to be reused safter reprocessing[3].

However, one should bear in mind that there is no main form of waste disposal, but rather one seeks the most adequate form for the main goal intended.

There are several objectives to be attained with solid waste management. Among them:

(i) the reduction of the amount discarded in landfills;

(ii) energy saving;

(iii) preservation of natural resources;

(iv) obtaining an economic advantage by enhancing the value of waste, and others.

From here on, what should be conjugated in this case are the following factors: waste characteristics, alternatives for management, final objective and social actors responsible.

However, the choice of a solution mechanism is always complex. In the specific case of packaging, for instance, the purpose of reuse should always

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[3] ARAGÃO, MARIA ALEXANDRA DE SOUSA. *O princípio do nível elevado de protecção e a renovação ecológica do direito do ambiente e dos resíduos*. Coimbra: Almedina, 2006. PP. 361-362.

be considered, beginning with the project that conceives this packaging, with a view to using resistant materials, besides an appropriate format.

Alexandra Aragão, among other authors, questions the process of choosing the waste disposal, since there is a mistaken idea that recycling would always be the environmentally most appropriate solution.

Recycling of materials in Brazil involves basically four major industrial sectors: aluminium, paper, plastic and glass. However, studies demonstrate that over the years no significant evolution has been found in the quantity of recycled materials, nor the improvement of techniques for this activity.

Moreover, even with the four main industrial segments, only a few types of materials are abundantly recycled, like plastic, PET and aluminum cans[4].

Actually, recycling may mean expenditures on other materials, such as fossil fuels, water or chemicals, which are possibly more scarce and more harmful than the raw material saved in recycling[5].

In general, when one talks to consumers about reverse logistics or selective collection, the idea that comes to their mind is waste recycling. Considering that recycling is not the only form of management, and as was said, was not always the most appropriate one, it is necessary to direct the appropriate information to the different actors who make up the production and consumption chain, for they are the really responsible people for the entire waste generation system.

Actually, information and environmental education allow "demistifying" recycling and the adoption of the most efficient and adequate means for material flow.

One of the main innovations of the *PNRS* was to create shared responsibility for the life cycle of the product, in which all actors in the production and consumption chain have a linked chain of individual obligations in waste management[6].

Thus, manufacturers and importers must see to the environmentally adequate disposal of the products and packaging, gathered or returned, and the environmentally adequate disposal of rejects; vendors and distributors must receive the wastes of certain products and packaging from the consumers and return them to the manufacturers or importers for appropriate treatment; consumers are obliged to separate the wastes and pack them adequately

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4 ABRELPE, *Panorama dos Resíduos Sólidos no Brasil*. special 10-year edition. 2012.

5 ARAGÃO, op. cit., 2006, P. 242.

6 For a detailed study of PNRS and the responsibility of each of the risk managers, see. LEMOS, PATRÍCIA FAGA IGLECIAS. *Resíduos sólidos e responsabilidade civil pós-consumo*. 2ª ed. São Paulo: RT, 2012.

and in a differentiated manner for selective collection, when implemented, and also return the products and packaging that are handled in reverse logistics. Finally, the public authorities regulate, inspect, and implement selective collections giving priority to the insertion of pickers.

In this context, risk managers must not only structure their systems to pick up and treat wastes, but also manage the information as an essential tool to prevent environmental damage.

On the one hand, the *PNRS* introduces cadasters of waste operators to the Public authorities. These cadasters must be fed by the economic agents, and will remain at the disposal of the public agencies and of any interested party to make it easier to control the return of wastes to the manufacturers or importers of the product. This is in agreement with the rights of access to environmental information that is in the hands of the Public Authority.

On the other hand, the *PNRS*, provides many mechanisms with information about the importance of the correct management and means of performing it as a right of the consumers, and duty of the supplier, in order to overcome failures in picking up wastes in the selective collection and reverse logistics system.

This is seen in art. 31, para II of the law when it requires the manufacturers, importers, distributors and vendors to strengthen the shared responsibility, with a duty to *"disseminate information concerning the ways of avoiding, recycling and eliminating the solid wastes associated with their respective products".*

Indeed, for the consumer to comply with their duty within the management chain, it is essential to have information about how they can use, handle and repair the product in order to reduce energy and water consumption, emissions, or even increase product durability[7].

Moreover, if the systems take into account the existence of delivery points for reusable and recycleable wastes, the consumer must be informed of the location of these delivery points, timetables, means of receiving the wastes, and other data that allow the consumer to package them appropriately and deliver them to the return system, in order to maintain and maximize to the utmost the possibilities of enhancing their value.

Indeed, enhancing the value of the wastes is one of the objectives of *PNRS* that, in fact, distinguished waste from reject: the latter is impossible to reintroduce in the production process or to recycle, so that it can only be finally disposed of in an environmentally appropriate manner, the former can be converted

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[7] GUANABARA, DIOGO CARDOSO; LEITÃO, MANUELA PRADO. *Conciliando o Direito dos Resíduos e o Direito do Consumidor: um Olhar Crítico sobre a Rotulagem e o Mecanismo de Logística Reversa Brasileiro*. Boletim de Direito Administrativo, São Paulo, NDJ, n. 11, nov. 2010, PP. 1290, 1292.

into an economic good, become merchandise, or be recycled, or reused in industry to spare the extraction of new natural resources as raw materials.

In order to accomplish this purpose, it is clear that campaigns for teaching purposes should be formulated by the Government authorities and by the economic agents subject to reverse logistics. However, one must not forget the importance of product packaging and labels in this context.

In fact, packaging is the first point of consumer contact with the product when they are in the supermarket and take it from the shelf. The visual contact, colors, texts and symbols are all immediately picked up by the consumer and processed in their brain. Often the consumer's decision to purchase the product is the result of this contact.

That is why the use of ecological labels on product packaging seems to be an effective means for it to communicate and interact with the consumer. The ecologically aware citizen will tend to look at the packaging for data that will assure the ecological quality of the product[8] in order to decide to purchase it or not at that time.

Likewise, the first place the consumer will look for information about the right way to dispose of the waste will be on the packaging.

In this sense, Law Bill nº 2433/2011 is going through the Brazilian House of Representatives. Its purpose is to introduce a provision in the *PNRS* that determines the duty of manufacturers and importers whose products are subject to reverse logistics, placing on their labels or packaging an informative text about the mandatoriness and environmental importance of delivering the waste to the respective collection points, as well as the site where they are located.

Likewise, in the Municipality of São Paulo, there is Law Bill nº 560/2011-SP, "standard disposal label "for products sold in this municipality, in order to enable directing the consumer to an up to date internet data base and telephone service to the consumer to access data concerning sites where information referring to points of disposal for recyclable materials can be found and also the people responsible for them, free of charge.

In another Brazilian sphere, the State of São Paulo has the Law on Technological Garbage (Law nº 13,576/2009-SP), that ensures supplying information on the packaging of electronic products regarding their appropriate disposal, calling attention to the dangers of disposing it together with other materials and the existence of toxic substances.

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[8] ARAGÃO, MARIA ALEXANDRA DE SOUSA. *A compra responsável e a prevenção de resíduos domésticos.* In: CONFERÊNCIA NACIONAL SOBRE A QUALIDADE DO AMBIENTE, 6, Lisboa, 1999. Actas. Lisboa: Universidade Nova de Lisboa, 1999, P. 2. v. 1.

Despite possible criticism about the effectiveness of the practical application of these standards, everyone recognizes the labels on the packaging as a transmission medium for messages, that is easily accessed by the consumer.

In practice, however, the path of the Sectorial Agreement on the reverse logistic system for packaging of lubricant oils, the first signed on a national level under the aegis of *PNRS*, did not provide a great advance.

Forecasts were made about the responsibility of manufacturers, importers and vendors in disseminating pedagogical actions, but there was only a brief mention of labeling in clause 4, Paragraph 6, "a":

> *"Insert on the label of lubricant oil packaging information defined by the regulating agency – ANP (National Oil Agency - Agência Nacional de Petróleo) – Resolution ANP-10/2007, including the importance of returning it to the establishment of the vendor who sold it."* [9]

The official notices calling to offer proposals of sectorial agreements to implement reverse logistics systems from other sectors, required the description of the mechanisms to disseminate information and educational actions concerning existing recycling methods and other means of ennvironmentally appropriate final disposal of solid wastes, associated with their respective products, aspects of their life cycle, care in handling, location or reception and collection points, but the use of labels for this purpose was not mentioned.

The need to standardize the use of certain terms concerning waste on the packaging and labels of products should also be mentioned[10].

An emblematic example is the use of the term "recyclable" on the packaging. Sometimes, without any additional information, there are doubts as to whether the recyclability trait pertains to the product or to the respective packaging. Besides, it may create confusion

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9 BRASIL. Ministério do Meio Ambiente. ***Acordo Setorial para a Implantação de Sistema de Logística Reversa de Embalagens Plásticas Usadas de Lubrificantes***, of December 19, 2012. Available at: <*http://www.abras.com.br/pdf/acordoembalagensoleo.pdf*>. Acesso em: 11 jul. 2013.

10 Idem. Chamamento para a Elaboração de Acordo Setorial para a Implantação de Sistema de Logística Reversa de Produtos Eletroeletrônicos e seus Componentes. Edital nº 01/2013. Available at:<*http://www.mma.gov.br/images/editais_e_chamadas/SRHU/fevereiro_2013/edital_ree_srhu_18122012.pdf*>. Access on Jul 12,. 2013; ASSOCIAÇÃO BRASILEIRA DE SUPERMERCADOS. ***Embalagens em geral: proposta foi entregue à Ministra do Meio Ambiente***, Izabella Teixeira. 22 dez. 2012. Disponível em: <*http://www.abras.com.br/supermercadosustentavel/logisticareversa/embalagens/embalagens-em-geral-proposta-foi-entregue-a-ministra-do-meioambiente-izabella-teixeira*>. Acesso em: 11 jul. 2013.

concerning the possibility of the material really being recycled within the local waste management structures[11].

As to the term “recyclable”and symbols that refer to this on the packaging of some products, the Ethics Council of the National Council of Self Regulation of Advertisement [*CONAR - Conselho de Ética do Conselho Nacional de Autorregulamentação Publicitária*] in Brazil had something to say regarding advertisements that violate the ethical principles established within its self-regulation[12].

In this case, a civil association questioned the Ethics Council as to whether the term “recyclable”could be considered true, since the recycling of the material used in the packagings generally was not accepted by the public programs of selective collection. The companies alleged that using them was only useful to make it easier to separate material, but that this was no guarantee that the material would really be recycled.

One of the companies acknowledged that the use of the term was not very appropriate and promised to improve it. The Councilor, however, did not consider that the message might become misleading publicity according to the ethics guidelines established by *CONAR*, and decided to drop charges[13].

Evidently there is a fuss that would certainly make it more difficult to manage wastes appropriately.

Otherwise, one of the objectives of the *PNRS*, in the list of art. 7, XV, is to encourage environmental labeling and sustainable consumption.

The environmental labeling referred to in this subparagraph is different from a label that was previously indicated, because it mean a quality stamp placed on the packaging of products after it has been approved in a environmental quality certification procedure[14].

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11 For the Federal Trade Commission of the USA, the term “recyclable” should be used only when the waste management system adopted in practice involves de facto recycling of the material indicated in this way. (See. FEDERAL TRADE COMMISSION (FTC). ***16 CFR Part 260: Guides for the use of environmental marketing claims***; Final Rule. Federal Register, n. 197, v. 77, P. 62122 a 62132, 11 out. 2012. Available at: <*http://www.ftc.gov/os/fedreg/2012/10/greenguidesfrn.pdf*>. Access on July 11, 2013.

12 CONAR has a Brazilian Code of Advertisement Self-Regulation which defines ethical guidelines in elaborating and conveying publicity in Brazil. It is not a formal law and, therefore its violation does not lead to sanctions, but merely to suspension or change of the advertisement. In Annex U, the Code provides guidelines about to use of sustainability attractions. Both the Code and the Decisions of the Ethics council are available at *www.conar.org.br*.

13 Representation nº 246/12; 247/12; and 248/12. Rapporteur Councilor José Genesi Jr., judged in November 2012/2012.

14 Cf. MARTÍN MATEO, RAMÓN. *Nuevos instrumentos para la tutela ambiental*. Madrid: Trivium, 1994, P. 23.

In general, the environmental labeling systems assume that there has been a meeting of a specialized committee, composed of technicians and members of the economic sector and of civil society, that defines high standard environmental quality criteria for a given list of products. Then the products of companies that are part of the previously established list and wish to obtain the environmental quality stamp when the procedures are voluntary are audited.

If real conformity is found with the previously defined standards, the certification confers the use of the environmental quality stamp for a given period, at the end of which the company must again submit the product to auditing, if it is interested in continuing to use that badge on its packaged products. The period is determined because the environmental standards are defined taking into account the best techniques available at the time of definition, and this evolves dynamically[15].

The use of the environmental label is regulated by Law, or by a contract celebrated between the company that has the product and the accredited certifying entity. Thus, if it is used inappropriately, in places where it has not been authorized, or after the license is no longer valid, there will be a violation of contract and misleading the consumer, which will lead to the appropriate charges.

Environmental labeling is an interesting instrument, especially when its legitimacy is officially acknowledged, because the strict selection of criteria and of the certification procedures, performed by an outside entity that is independent and even accredited by the public authorities, confers safety and the guarantee to the consumer that the information posted on the product package is true and has been proved, and that consuming that good in fact causes less environmental degradation[16].

It was based on that premise that environmental labeling systems were developed. They are official in several parts of the world, the best known being the German Blue Angel, and the European Ecological Label

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[15] Cf. SOMMERVOGEL, 2004, P. 16 et seq.

[16] Cf. FRAGUÍO, PILAR DOPAZO. *El régimen jurídico de las marcas de calidad ambiental: etiqueta ecológica y tutela ambiental*. Madrid: Exlibris, 2001, P. 40/42; SALZMAN, JIM. (Coord.). *L'étiquetage écologique des produits dans les pays de l'OCDE*. Paris: OCDE, 1991, P. 13; LEITÃO, MANUELA PRADO. *Rotulagem Ecológica e o Direito do Consumidor à Informação*. Porto Alegre: Verbo Jurídico, 2012, P. 80/97.

[European Ecolabel][17]. In Brazil there is the ABNT Green Stamp. Some official labeling programs which cover only an environmental aspect of the product throughout its life cycle, and that are regulated by law, are SELO PROCEL about conservation and the rational use of energy (Decree of December 8, 1993); the energy certification of domestic electrical appliances (Lei n. 10,295/2001 and Decree n. 4,059/2001); the energy certification of vehicles (Inmetro Administative Ruling n. 391/2008); and the certification of organic foods (Law n. 10,831/2003 and Decree n. 6,323/2007).

In this sense, the diffusion of the meaning of the environmental labels, and the encouraging their identification by the consumer, on the product packagings at the time they are acquired, enable the growth of a demand for products of this kind, forcing the industry to develop clean technology, according to the dictates of a green economy.

In the words of Maria Alexandra de Sousa Aragão, both the environmental labeling and the use of concepts that shed light on the environmental impacts of products should be available to the consumer for them to contribute to prevent damage and waste:

> *"The practical application of these concepts would allow classifying the products according to their environmental performance as to the expenditure of materials and the environmental impacts of the wastes. Conveying them to the consumers would make it easier to appreciate the qualities of the product and decision making consistent with the information available, enabling the sorting of the future wastes, already at the time of purchase. This greening of the purchasing choices would of course directly influence the offer of products."* [18]

From this perspective, the role of design is essential in creating packaging. It is relevant not only in creating packaging that is more appropriate to the environmental quality standards, because of the materials used, weight, durability, and safety, but also in the challenge of calling the consumer's attention and conveying sufficient, precise information in a small space on the packaging.

Another interesting aspect of this interdisciplinarity which at the same time, involves education and participation of civil society, are competitions

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[17] Respectively available at: *http://www.blauer-engel.de/en/ and http://ec.europa.eu/environment/ecolabel/*. The latter is regulated by Regulation (EC) nº 66/2010, of 25 nov. 2009. Cf. Também GERTZ, RENATE. ***Access to environmental information and the German blue angel: lessons to be learned?*** European Environmental Law Review, Hague. v. 13, n. 10, P. 268-275, 2004.

[18] *Free translation* ARAGÃO, op.cit. 1999, P. 3.

to create labels and logos for sustainability, to be placed on the packaging of certain kinds of product.

An example of this is the European experience with creating the label for biological products.

The biological production is strictly disciplined by Regulation (EC) nº 834/2007, and only products that have obeyed the rules of this Community Regulation, with consequent verification by the appropriate agency, can use its symbol.

In order to encourage the consumption of these products, a competition was held among design students of the European countries to create a new logo to represent biological production. Then the proposals presented were submitted to a vote on an official European site and the winning design was incorporated into the packaging of these products[19].

The involvement of civil society, both at the time the proposals are created, and in the vote, made it possible to get to know the premises involved in biological production and the way the consumer can identify it on the product packaging, making their acccess more democratic[20].

FINAL CONSIDERATIONS

This study attempted to elucidate the main issues involving the right to environmental information in the context of adequate waste management, under the legislation in force in Brazil.

Based on the analysis performed, it is clear that all existing public policies in the country regarding this matter must be articulated, ranging from the macro level of waste management impacts to the microsphere of the consumer; from formal education to informal education.

In this context, the packaging may be one of the means by which part of this information is conveyed, in a simple, quick and effective manner, as long as it is in the scope of socioenvironmental protection.

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19 EUROPEAN UNION. European Commission launches competition to create a new EU organic logo. Press release. Disponível em: *http://europa.eu/rapid/press-release_IP-09-640_en.htm*. Acesso em: 11 jul. 2013.

20 Cf. LEITÃO, P. 102/104.

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A READING ON POSSIBLE LEGAL STRUCTURES FOR BUSINESSES INVOLVING CATADORES, APPROPRIATE TO BRAZILIAN REALITY

CARLOS PORTUGAL GOUVÊA
ANA CAROLINA MONGUILOD

The legal memorandum described below was the result of a consultation performed in 2011 by movie producer Jacqueline "Jackie" Coelho de Botton, Executive Director of Project Wastelands, for the Levy & Salomão Advogados law office, through partner Mariana Tavares, about difficulties faced by recyclable materials catadores of the Gramacho Landfill.

At the time, the catadores of the Gramacho Landfill had two concerns. One of them was the imminent closing down of the sanitary landfill located in the neighborhood, a site shown in the documentary titled *Lixo Extraordinário* (BRASIL, 2010). The full length fim discusses the work of plastic artist Vik Muniz with recyclable materials, and it was nominated for the Oscar in 2011. The other concern was caused by the enactment of Law nº 12,305, of August 2, 2010, which instituted the National Policy of Solid Waste, because of uncertainty as to its impact on the catadores'activity.

Performed pro bono, the memorandum produced by *Levy & Salomão Advogados* was used by the Gramacho Landfill catadores to plan a better form of collective organization and articulation of their demands made to the Government.

INTRODUCTION

The rules contained in Federal Law nº 12,305, of August 2, 2010 "Law of Solid Wastes" (BRASIL, 2010A) reflect the government's acknowledgment of the major role of cooperatives and other forms of associations of collectors (*catadores*) of reusable and recyclable materials as agents for the integrated management of urban solid wastes. These rules also establish the participation of these cooperatives and other forms of social entities connected to the *catadores* of recyclable materials in the recycling process. The Law of Solid Wastes, however, does not guarantee specific rights or benefits to the catadores and their cooperatives or associations, they can only formulate a public policy on the subject.

In this context it is necessary to think about the most appropriate legal structure for the enterprises involving catadores of recyclable materials so as to integrate them in a fitting manner to the different production chains of the materials they collect and reintroduce into the industrial circuit. Thus, this chapter presents a legal analysis of the structures most appropriate to achieve the objectives of Project Wasteland [1], related to the reorganization of workers currently connected to various cooperatives of catadores working in the Metropolitan Landfill of Jardim Gramacho, in the city of Duque de Caxias, Rio de Janeiro (*"Projeto"* and *"Aterro de Gramacho"* respectively).

The following points were analyzed throughout the text:

(i) legal structures possible to gather and encourage the interests of the recyclable material collectors;

(ii) main aspects of the non-profit entities in Brazil, connected to the Project, as well as the legal requirements that must be fulfilled for the existing benefits to be obtained;

(iii) the main exemptions, immunities and reductions of available taxes considering the activities to be developed by the organization, and also the legal requirements that must be met in order to obtain these benefits; and

(iv) the most important aspects of the relationship betweeen the *catadores* of recyclable materials and big industry

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[1] The content of this chapter was the result of a legal memorandum presented by the *Levy & Salomão Advogados* legal firm, located in São Paulo, on the request of the Executive Board of Project Wasteland in the context of the deactivation of the Gramacho Landfill in Duque de Caxias (RJ). Since its content is very important, publication was authorized by the firm and by the people responsible for project Wasteland.

POSSIBLE LEGAL STRUCTURES AND ADAPTATION TO BRAZILIAN REALITY

This analysis will be based on a few premises, namely,
(i) nowadays there are already a series of cooperatives of collectors of recyclable materials working in the Gramacho Landfill with different administrative structures and governance;
(ii) when the Gramacho Landfill is deactivated, maintenance of the activities of recyclable materials collectors will depend on supplying materials to big industry; and
(iii) currently the collectors of recyclable materials do not have sufficient know-how to negotiate with big industry.

Therefore we believe that it would be advisable to establish a non-profit entity in the form of an association, for the reasons presented below, aiming to provide technical assistance in legal, accountancy, administrative and negotiation matters to the already existing catadores' cooperatives.

Besides creating the association, there is the possibility of forming a "central" cooperative, or "model" cooperative, which would receive direct assistance from the association. In the case of the "central" cooperative, this would congregate the already existing cooperatives. If it is not possible to set up a "central" cooperative immediately, an alternative would be to create a "model" cooperative to which the recyclable materials collectors could migrate voluntarily.

TYPES OF NON-PROFIT ENTITIES

According to Brazilian law there are 3 (three) main types of non-profit entities, namely: associations, foundations and cooperatives[2]. In the present case, it appears more appropriate to set up an association to provide technical assistance to the already existing cooperatives, since foundations may require significant initial patrimony. Because of the premises mentioned above, it would

[2] An association is an organization established by a group of people whose activity does not aim at profit. A foundation is a non-profit organization established with an endowment of assets. A cooperative is a non-profit organization established by a group of people aiming to improve their economic activity, gaining in the scale of production and becoming more competitive, for instance.

also be advisable to create a central cooperative or a model cooperative as part of the Project development. Therefore this section will only concentrate on describing the legal structures of associations and cooperatives.

ASSOCIATIONS: MAIN ASPECTS

Associations in Brazil are commonly linked to activities in recreation, charity, culture, well-being in general, and they may provide services to their own members, to a specific community or to society as a whole. Associations can develop activities that will generate profit, but the respective profits cannot be distributed among their members Thus, associations can make a profit which must be entirely re-invested in their own activities (see Article 53 of the Brazilian Civil Code – "Código Civil").

-REQUIREMENTS FOR CONSTITUTION

The bylaws of an association must be written and must identify the name of the association, its purpose, requirements for admitting and dismissing members, rights and duties of members, the governance structure, the procedure to perform an addition to the bylaws, effects of dissolution and financial control, among other legal requirements[3].

-EQUITY AND FINANCING

The associations do not have equity and are usually maintained by charges paid by the members, donations, contingency funds and by their economic activities that can generate revenues[4].

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[3] The list of legal requirements to draft the bylaws and the documents needed to create an association are in Section II.4. below.

[4] If an association is dissolved (article 61 of the Civil Code), the remaining net patrimony, after deducting the shares or fractions of their property, must be transferred to another non-profit organization, as per the bylaws. If the bylaws do not supply this information, the members must transfer the remaining assets to a government entity with similar aims. The members may received all the contributions they have made to the association patrimony before the net profit is distributed as described above.

-BODIES

The associations generally have the following bodies[5] (of which the General Meeting of Members and the Board are mandatory):

(i) GENERAL MEETING OF MEMBERS: is the deliberative collegiate body of the association and all members are part of it. Each member has the right to one vote at the General Meeting. According to article 59 of the Civil Code, the General Meeting may, at their exclusive criterion, remove directors from office and modify the bylaws ;

(ii) BOARD OF DIRECTORS: this is the body that conducts the daily activitities of the organization and implements all decisions made by the General Meeting of members;

(iii) AUDIT COMMITTEE: this is the body responsible for making sure that legal and statutory rules are being complied with, and also to provide transparency in the financial statements of the association. The associations that wish to obtain the status of Civil Society Organizations of Public Interest (OSCIP-Organizações da Sociedade Civil de Interesse Público) must establish an Audit Committee, as set forth in Article 4, III, of Law nº 9.790 of March 23, 1999; and

(iv) DELIBERATIVE COUNCIL: is the optional body generally composed by people who are experts in matters pertaining to the purpose of the association, and it may have powers to deliberate on given matters such as the election of directors.

The members of an association can be divided into categories with different advantages and rights, as for instance, “founding members” and “honorary members”.

-CERTIFICATES

The association to be created as part of the Project might obtain the following certifications and qualifications[6]:

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[5] Art. 54, V and VII, and art. 59, single § of the Civil Code.

[6] Non profit organizations can also obtain the so-called Títulos de Utilidade Pública (Certificates of Public Usefulness) and the qualification of a Social Organization. The Titulos de Utilidade Pública have mostly been surpassed by the Certificate as a Beneficial Organization for Social Welfare (Certificado de Entidade Beneficente de Assistência Social. para assegurar os mesmos benefícios fiscais do Certificado de Entidade Beneficente de Assistência Social), which is usually much more difficult and slower to obtain. The certificate of Social Organization, in turn, depends on government concession and its purpose is to administrate public goods. Thus, we believe that neither certificate is appropriate to the aims of the Project.

(i) CERTIFICATE AS A CHARITABLE ORGANIZATION FOR SOCIAL WELFARE[7]; the bodies that have this status can receive certain tax benefits, as long as they meet the legal requirements. The Certificate as a Charitable Organization for Social Welfare is issued by: **(A)** the Ministry of Health to organizations that supply health services; **(B)** the Ministry of Education to organizations that supply educational services; and **(C)** by the Ministry of Social Development and Fighting Hunger to organizations that supply social welfare services. As a rule, only bodies that are at least 1 (one) year old can obtain this certificate, but a few exceptions are accepted.

(ii) CIVIL SOCIETY ORGANIZATIONS OF PUBLIC INTEREST – OSCIPS: Associations[8] can be qualified as OSCIPs by the Ministry of Justice as long as they meet several legal requirements (from Law nº 9.790, of 1999 and Decree nº 3.100, of 1999). In order to be considered an OSCIP, the nonprofit organization must promote activities foreseen by law, among which the most appropriate to the Project appear to be the following: **(i)** advocacy, preservation and conservation of the environment and sustainable development; **(ii)** economic and social development and fighting poverty; **(iii)** nonprofit experimentation with new socioproductive models and alternative systems of production, trade, employment and credit; and **(iv)** studies and research, development of alternative technologies, production and dissemination of information and technical and scientific knowledge concerning the activities mentioned above.[9] The government has 30 (thirty) days to analyze the request, and another 15 (fifteen) days to publish its decision in the Federal Gazette (Diário Oficial da União). The qualification as OSCIP can be held, together with the Certificate as a Charitable Organization for Social Welfare.[10] An OSCIP can sign

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7 See Federal Law nº 12.101, of November 27, 2009 and Presidential Decree nº 7.237, of July 20, 2010.

8 Like the foundations.

9 IF the OSCIP performs activities in health or education, the services supplied to the community must be exempt from any payment. The organization that wishes to request the title of OSCIP must be set up and have its main offices in Brazil, and its bylaws must fulfill the requirements established in article 4 of Law nº 9,790, of March 23, 1999. OSCIP bylaws must contain the` following provisions: (i) adoption of practices that prevent conflicts of interest; (ii) an audit committee; (iii) a transfer of assets to a similar organization in case this one is dissolved; (iv) publication of financial statements; and (v) possibility of paying or not paying the directors.

10 The Ministry of Justice, in a verbal consultation on March 10, 2011, confirmed the current undestanding that the certificate as a charitable organization of social welare can be accumulated with the qualification as an OSCIP under law nº 9,790, of March 23, 1999, , due to the changes implemented by Law nº 12,101, of November 27, 2009. It is however advisable to formally consult the Ministry of Justice, before requesting the certificate as a charitable organization of social security, to certify the Ministry of Justice's view regarding the possibility of accumulation in the case at hand.

a partnership with the government to promote its activities; through the so-called "Letter of Partnership", the OSCIP can receive government resources or another kind of support from the government to carry out projects of public interest. Besides, the OSCIP can pay a salary to its directors according to market values, without, however, going beyond the limit of remuneration of government employees of the Federal Executive Branch (article 34 of Law nº 10.637, of December 30, 2002.

-FISCAL ASPECTS -IMMUNITY-

According to article 150, sub-paragraph VI, paragraph "c" and paragraph 4th indent "c", and paragraph 4 of the Federal constitution. the nonprofit institutions of education and social welfare enjoy immunity from taxes as to their patrimony, income or services, when related to their essential purposes.

This immunity forbids instituting taxes (and not other types of taxes such as rates and contributions) inciding on patrimony, revenue or services pertaining to the purposes of these bodies by the Federal Government, States and Municipalities[11].

In order to enjoy the benefits of immunity it is necessary to comply with the requirements set forth in article 14 of Law nº 5,172, of October 25, 1966 (National Tax Code – *Código Tributário [CTN]*), namely:

(i) non distribution of any part of their patrimony or incomes, for any reason;

(ii) applying their resources entirely in this country, to maintain the institutional objectives; and

(iii) maintaining the accounting of revenues and expenditures in books with the appropriate formalities that ensure their accuracy.

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[11] Immunity thus includes taxes on any patrimony, income and services, such as Income Tax (IR), Taxes on Services of any Nature (ISS) and Urban Property Taxes (IPTU),. As to the other taxes which do not incide as clearly on patrimony, income and services (such as Tax on Operations for the Circulation of Merchandise and the Provision of Services of Interstate and Intermunicipal Transport and Communication (ICMS) , the Federal Supreme Court (STF) has already decided that they would also be subject to immunity. Because of a relief injunction in the Direct Lawsuit on Inconstitutionality (ADI - Ação Direta de Inconstitucionalidade N4. 1802 MC/DF, of Augsut 27, 1998, issued by the Plenary of the STF and published on February 13, 2004, which provisionally suspended the use of paragraph I of article 12 of Law nr 9532 of December 19, 1997, immunity is also applied to income and capital gains obtained in financial fixed income or variable income investments.

Furthermore, according to article 12 of Law nº 9,532/97, an educational or social welfare institution that provides the services for which it was instituted and puts them at the disposal of the population at large, as a complement to the activities of the State, on a non profit basis will be considered immune. According to Law nº 9,532/97[12], to enjoy immunity the institution must obey the following requirements:

(i) not remunerate, in any form, its directors, for services rendered; the exception is only for the remuneration of the directors who have a regular job paid for by Civil Society Organizations of Public Interest – OSCIPs (qualified according to Law n° 9,790, of March 23 of 1999, and by Social Organizations (*Organizações Sociais [OS]*), (qualified according to Law n° 9,637, of May 15, 1998), and as long as the reemuneration does not exceed given limits[13];

(ii) apply their resources entirely to maintain and develop their social objectives;

(iii) maintain a full accounting of their revenues and expenditures in books according to the formalities that ensure respective accuracy;

(iv) keep in good order, for 5 years, counting from the date of issuance, the documents that prove the origin of their revenues and the expenditures really made, as well as any other actions or operations performed that will modify their patrimony;

(v) annually present the Income Tax Statement according to what is determined by the Brazilian Federal Internal Revenue Service (*Receita Federal do Brasil [RFB]*);

(vi) ensure that their patrimony will be transferred to another institution that will fulfill the conditions to enjoy immunity in case of being incorporated, merged, or terminating its activities, or to a government agency;

(vii) not present a surplus in their account or, if they do, present it for a given fiscal year, and use the result fully to maintain and develop their social objectives;

(viii) not pay, in favor of its members or directors, or also in favor of partners, shareholders or directors of a legal entity associated with it, in any form, expenditures considered non deductible in determining the base for calculating income tax or the social contribution on net profit;

[12] There requirements presented here are in article 12 and single paragraph of article 13 of Law nº 9,532/97. Other requirements presented in paragraph two, indent "f" of article 12 in the heading of article 13 and in article 14 were suspended by a relief injunction in ADI nº 1802 MC / DF.

[13] The gross remuneration cannot be more than the limit established for the remuneration of govern ment employees of the Federal Executive Branch (Art. 34 of Law n° 10,637, of December 30 of 2002).

(ix) other requirements, established by a specific law, involving the functioning of such organizations.

As to the contributions to Social Security, such as the Social Contribution on the Net Profits (*Contribuição Social Sobre o Lucro Líquido [CSLL]*), the Contribution for Financing Social Security *(Contribuição para o Financiamento da Seguridade Social [Cofins]*), and the Contribution to the National Institute of Social Security (*Contribuição para o Instituto Nacional do Seguro Social [INSS]*), article 195, paragraph 7 of the Federal Constitution grants immunity to bodies that benefit from social security and meet the legal requirements.

In order to enjoy immunity for INSS and CSLL , article 29 of Law nº 12,101, of November 27, 2009 establishes several requirements, namely[14]:

(i) the entity, constituted as a non-profit private legal entity, must have the Certification as a Charitable Body for Social Welfare, obtained according to Law nº 12,101/09 and the regulation of Decree nº 7,237, of July 20, 2010;[15]

(ii) directors, councilors, members, institutors or benefactors should not receive any remuneration, advantages or benefits, directly or indirectly, in any form or title, because of competencies, functions and activities assigned to them by the respective incorporation articles of organization;

(iii) to apply their incomes, resources and possible surplus entirely on national territory, to maintain and develop their institutional objectives;

(iv) present a clearance certificate or liability certificate with the effect of a clearance certificate for debits involving taxes administered by the Office of the Brazilian Federal Revenue Service (RFB) and compliance certificate for the Severance Pay Indemnity Fund (*Fundo de Garantia de Tempo de Serviço [FGTS]*)

(v) maintain regular bookkeeping that will record revenues and expenditures and also apply in a gratuity in a segregated form, according to the rules emanating from the Federal Council of Accountancy (*Conselho Federal de Contabilidade [CFC]*);

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14 About this it should be noted that article 44 of Law nº 12,101/09 revoked article 55 of Law nº 8,212, of July 24 of 1991 which formerly established the requirements to enjoy that immunity.

15 For this the organization should, among other conditions : (i) obey the principle of universality of service (it is forbidden to direct its activities only to its members or to the professional category); (ii) show, in the fiscal year prior to the request, subject to the minimum period of 12 months counted from the date the entity was formed, that they have served the requirements foreseen in Chapter II, Section III of Law nº 12,101/09; (iii) foresee, in its acts of incorporation, that, in case of dissolution or extinction of the entity, any remaining patrimony must be directed to a similar nonprofit entity or to public entities.

(vi) not distribute results, dividends, bonuses, participations or part of their patrimony in any form or pretext.
(vii) keep in good order, for 10 years counting from the date of issuance, the documents that prove the origin and application of their resources and those involving actions or operations performed that imply changing the patrimonial situation of the organization;
(viii) comply with the accessory liabilities established in fiscal law; and
(ix) present the accounting and financial statements duly audited by an independent auditor legally accredited to the Regional Councils of Accountancy, when the annual gross income made is higher than the limit established by Complementary law nº 123, of December 14, 2006.

Revenues related to the activities that are the institutional objectives of the non profit charitable welfare organization do not have to pay Cofins as long as the requirements mentioned in items 17 and 19 above are met.[16] Revenues that are not the institutional objectives of the organization should pay Cofins with a 3% aliquot.[17]

For non profit social welfare organizations that comply with the requirements described in item 17 above, the contribution to PIS is to be paid at an aliquot of 1% exclusively on the payroll of the organization.[18]

-EXEMPTION

If the organization to be set up does not manage to meet the requirements to be considered immune, even so it will be able to enjoy exemptions and/or reductions of several taxes (the most important ones being federal taxes and contributions), as long as the requirements foreseen in the law are met. The most relevant exemptions/reductions cover:

(i) exemption from the Income tax of legal entities *(Imposto de Renda da Pessoa Jurídica [IRPJ])* and of CSLL, as long as a few legal requirements foreseen in item 17 above are met[19,20]; and

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16 Articles 14, X, of Provisory Measure (MP) nº 2,158-35, of August 24, 2001, 19 of Law º 12,101/09 and 23 of Law nº 8,212/91.
17 Under the cumulative regimen of taxation, as per art. 10, IV of Law nº 10,833, of December 29, 2003.
18 Art. 13, III and IV of MP nº 2,158-35/01.
19 Articles 12 to 15 of Law nº 9,532/97 and 10 of Law nº 9,718, of November 27, 1998.
20 The Income Tax exemption for non profit entities does not extend, however, to incomes and capital gains earned by the entity in fixed or variable income financial investments (Art. 15, §2º of Law nº 9,532/97).

(ii) non-profit organizations that meet the requirements mentioned in "i" in this item, are subject to PIS (Social Integration Program tax levied on the total sales of corporations) at an aliquot of 1% exclusively on the payroll,[21] with an exemption of Cofins for revenues related to the activities that are their institutional objectives.[22]

Therefore, as long as the requirements foreseen in law are complied with, the association that may have been created could use the exemptions foreseen for the civil associations that render services for which they were formed and place them at the disposal of the group of people for whom they are meant, without any profit.

COOPERATIVES: MAIN ASPECTS

Cooperatives have their own legal regime as foreseen in Law nº 5,764, of November 16, 1971)1 ("Law of cooperatives"), as a legal entity, but not subject to bankruptcy.

-REQUIREMENTS TO FORM A COOPERATIVE

A singular cooperative is formed through a General Meeting of at least 10 (ten) members, at which the bylaws have to be approved, the shares of the equity have to be underwritten and paid in and the officers of the administrative and supervisory bodies must be elected.

Central Cooperatives, Federations and Confederations. Three singular cooperatives are needed to form a central cooperative or federation, and at least three central cooperatives or federation of cooperatives to form a confederation of cooperatives.

-EQUITY

There is no longer an obligation to have minimum equity to form the cooperatives, which may even not have equity. The equity will be subdivided

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[21] Art. 13, IV of MP nº 2,158-35/01.
[22] Art. 14, X of MP nº 2,158-35/01.

into shares, whose unit value must not be higher than the highest minimum wage in the Country, and no member of a cooperative can subscribe more than 1/3 (one third) of the total equity.[26]

-MANDATORY BOOKS

A cooperative society must have the following books:
(A) Member registration;
(B) Minutes of the General Meetings;
(C) Minutes of the Administrative bodies;
(D) Minutes of the Audit Committee;
(E) presence of members at the General Meetings; and
(F) others, fiscal and bookeeping, which are mandatory.

-FUNDS

The bylaws must, mandatorily, establish a Reserve Fund and Fund for Technical, Educational and Social Assistance, and they must have a minimum percentage of 10% (ten percent) and 5% (five percent), respectively of the net surplus of the financial year.[27]

-BODIES

The cooperatives generally have the following bodies (the General Meeting of the Members, the Administrative Council/Board of Directors and Audit Committee are mandatory):

(i) GENERAL MEETINGS OF MEMBERS: this is the highest body of the society, within the legal and bylaw limits. It has the power to decide on business involving the purpose of the society, and to make decisions that are convenient for the development and defense of the society, and their deliberations are binding on all, even if they are absent or disagree.
(ii) BOARD OF DIRECTORS OR ADMINISTRATIVE COUNCIL:
its members are elected in a General Meeting for a term of at most

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[26] Save in the cooperatives where the subscription should be directly proportion to the financial turnover of the cooperative member or to the quantity of products to be commercialized, processed or transported, or also with regard to the cultivated area or number of plants and animals involved.
[27] Art. 28, of Law 5,764, of December 16, 1971.

4 (four) years, and it is mandatory to renew at least 1/3 (one third) of the members.

(iii) AUDIT COMMITTEE: it is the body responsible for supervising the society administration. It is composed by 3 (three) full members and 3 (three) substitute members elected annually by the General Meeting. It is mandatory to renew at least 2/3 (two thirds) of the members.

TAX ASPECTS

In the current case, a cooperative of collectors and recyclers of recyclable materials would be formed. In our opinion, it would be the equivalent to the so-called "production cooperatives". According to the Law of Cooperatives, the cooperative societies are organized to provide services to their members, without profit (articles 3 and 4).

Taxation may vary depending on what kind of action they take, considered "cooperative" and "non-cooperative".[28]

According to article 79 of the Law of Cooperatives, "cooperative actions" are those "practiced between the cooperatives and their members, between the members and the cooperatives, and by the cooperatives with each other when members, to achieve the social objectives".

Its single paragraph explains that "cooperative actions do not imply market operations, nor sale and purchase contract of a product or merchandise". Since it does not imply market operations, the cooperative action should not be taxed.

On the other hand, actions considered "non-cooperative", even if carried out according to the Law and within the limits of the social objectives of the cooperative can be considered taxable.[29]

According to the Brazilian Inland Revenue Service (*Receita Federal do Brasil [RFB]*), "Non-cooperative actions are those that mean operating with non-member third parties" (our italics).[30]

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[28] See arts. 210 and 211 of Normative Instruction of the Federal Revenue of Brazil nº 971, of November 13, 2009.

[29] About this see article 111 of the Law of Cooperatives, which allows the taxation of operations pertaining to non-cooperative actions ("Art. 111. Taxable income will be considered the postiive results obtained by the cooperatives in the operations dealt with in articles 85, 86 and 88 of this Law".

[30] Question 12 in Chapter XVII of the section "Questions and Answers of the Statement of Economic-Fiscal Information of Legal Entities (Perguntas e Respostas da Declaração de Informações Econômico-fiscais da Pessoa Jurídica)" (DIPJ) 2011.

The Superior Court of Justice (*Superior Tribunal de Justiça [STJ]*), in turn, having previously issued an opinion that the cooperative action should be broadly interpreted, covering even the sale of merchandise to non-members as a cooperative action,[31] issued a more recent decision in the sense that the cooperative action must be interpreted in a limited manner. On this occasion it was considered that "cooperative actions, as per legal definition, do not involve a third party that is a party to the cooperative-cooperative member relationship, and also may not imply market operations or purchase and sale contract for product or merchandise).[32]

Thus, although there is no doubt that "cooperative actions" proper (considered those practiced between cooperatives and members) should not be taxed,[33] there is not the same certainly regarding the operations performed with a third party (non members).

We have heard that, based on article 3 of Law nº 5,764/71, several Brazilian cooperatives advocate that the results of all actions , and any developed within their social objective, even involving operations with non-member third parties, are not taxable.

However, the regulation and instructions of the Internal Revenue Service of Brazil (*RFB*) on this matter are not clear. Likewise, there is no established case law on the matter. Therefore we recommend that the fiscal authorities be consulted asking them to confirm the correct interpretation of the tax law.

-EMPLOYERS' SOCIAL SECURITY CONTRIBUTION

The single paragraph of article 15, Law nº 8,212/91, renders the cooperative equivalent to businesses for social security purposes. Article 22, III also establishes that the production cooperative is subject to a social security

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31 In this sense the vote of High Court Justice Eliana Calmon of the STJ should be considered in judging the REsp nº 1,081.747/PR, DJe 29/10/2009, which classified the purchase and sale of merchandise from the cooperative with non-members as a typical cooperative action.

32 STJ, AgRg in AI nº 1,386.385/RS, Rel. Min. Herman Benjamin, DJe 09/06/2011.

33 Tax legislation conveys this idea through articles 182 and 183 of Decree nº 3,000, of March 26, 1999 (Income Tax Regulation- RIR/99 Regulamento do Imposto de Renda). As to the CSLL, Law nº 10,865, of April 30 2004, rendered explicit in its article 29, that "the cooperative societies that obey the disposition in specific legislation, concerning cooperative actions, are exempt from the Social Contribution on Net Profit -CSLL Social Contribution on Net Profit (our italics).

contribution of 20% over the remunerations paid or credited to individually insured payers who render services to it.[34]

Additional contributions (a total of 5.8%) will be payable to the so-called "third parties" under the "S system" (for instance National Service for Learning Cooperativism (*Serviço Nacional de Aprendizagem do Cooperativismo [SESCOOP]*); Brazilian Service of Support to Small and Very Small Businesses (*Serviço Brasileiro de Apoio às Micro e Pequenas Empresas [SEBRAE]*).

If the members of cooperatives who are affiliated to the production cooperative are subject to special conditions that will be harmful to their health or physical integrity (in other words, subject to harmful agents/conditions), an additional contribution of 12%, 9% or 6% may be payable.[35]

-SOCIAL SECURITY CONTRIBUTION OF THE COOPERATIVE MEMBERS

The production cooperative must retain and collect as a contribution to social security 11%[36] of the remuneration paid to the cooperative members,[37] obeying the minimum and maximum limits of the salaries on which social security dues are paid.[38]

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34 It should be noted that under social security laws, cooperative members who render service to the production cooperatives are considered "individual taxpayers". About this, we highlight article 9 of the Normative Instruction of the Brazilian Federal Income Tax nº 971, of November 13 2009: "Art. 9 Should mandatorily contribute as individual taxpayers 9...) XVII – a worker associated with the production cooperative who under these conditions renders services to the cooperative, by remuneration adjusted to the work done.

35 Article 1 of Law nº 10,666, of May 8, 2003.

36 Article 65 of IN nº 971/09: "The social contribution for social security of individual taxpayers insured is: (...) II – for taxable events that occur from April 1, 2003 onwards, obeying the maximum limit of salary on which social security dues are paid, with disposition in art. 66, of: (...) b) 11% (eleven per cent), considering the deduction foreseen in § 1, inciding on: (...) 3. the retribution of the cooperative member when they provide services to the production cooperative (...)".

37 Art. 214 of IN nº 971/09: "Art. 214. The remuneration of the individual taxpayer insured affiliated to the production cooperative is the amount paid to him or credited, corresponding to the result obtained in production."

38 According to the Interministerial Administrative Ruling (Portaria Interministerial MPS/MF) nº 407, of July 14, 2011, from January 1 onwards the contribution salary cannot be greater than R$ 3,691,74 (three thousand, six hundred and ninety-one reais and seventy-four centavos), nor less than R$ 540.00 (five hundred and forty reais) in the competencies of January and February 2011, and than R$ 545.00 (five hundred and forty-five reais) from March 1, 2011 onwards.

COMPARATIVE TABLE

The table below summarizes the main differences between associations and cooperatives in Brazil.

Association	Cooperative
Non profit society of people	Non profit society of people with a specificity of action in productive/commercial activity.
Mínimum of 2 people to constitute it	Mínimum of 10 people to constitute it
Does not have equity. Its patrimony consists of the dues paid by the members, donations, funds and reserves.	It is not mandatory, but it usually has equity.
The members are not directly responsible for obligations contracted by the association.	The members are not directly responsible for the obligations contracted by the cooperative, except to the limit of their shares, and also in the cases in which they decided that their responsibility is unlimited.
The possible surplus obtained from operations among the members will be invested in the association itself.	After a decision taken in a General Meeting, the surplus is divided according to the business volume of each member.

TABLE 1 Main differences between associations and cooperatives in Brazil.
Source: Elaborated by the authors.

-DOCUMENTS AND PROCEDURES -ASSOCIATION-

The following steps must be taken to constitute an association in Brazil: **(i)** Holding a General Meeting of members to approve the association by-laws. The General <eeting must indicate at least: **(a)** date the association is formed; **(b)** place; **(c)** name, nationality, property regimen, marital status, profession, number of enrollment in the Tax Registry of the Federal Treasury (Cadastro de Pessoas Físicas do Ministério da Fazenda (*CPF/MF*) and address of all the founding members; **(d)** the purpose of the General Meeting; **(e)** approval of name, address and bylaws of the association; **(f)** election and inauguration of the members of the Board of Directors; **(g)** establishing the term in office of the directors; and (h) signature of the president of the association and of the present secretary of the General Meeting of members. The bylaws should contain at least: **(a)** name, adddress and period of the association; **(b)** the administrative

structure that should contain at least the Board of Directors and the Audit Committee; **(c)** powers and competencies of each body, number of positions and consequences of resignation; **(d)** rules applicable to the General Meeting of members; **(e)** rights and duties, cases of admission and dismissal and exclusion of members; **(g)** sources of resources admitted; **(h)** procedure to alter the bylaws; and **(i)** dispositions about the dissolution of the association and also the consequent destination given to its assets.
(ii) Registration of the following documents involved in constituting the association at the Civil Registry Office for Legal Entities: **(a)** 2 (two) original copies of the General Meeting of members; **(b)** list of people present at the General Meeting; **(c)** 2 (two) original copies of the bylaws signed by the president of the association and by a lawyer and certified by a notary and **(d)** form addressed to the Civil Registry Office for Legal Entities requesting the registration of the documents mentioned in the items above, signed by the legal representative of the association.
(iii) Registration of the association in the National Tax Registry of Legal Entities of the Federal Treasury (*Cadastro Nacional da Pessoa Jurídica do Ministério da Fazenda [CNPJ/MF]*);
(iv) Opening a bank account for the association;
(v) Registration of the Association at the appropriate City Administration;
(vi) Registration of the association at the National Institute for Social Security (*Instituto Nacional da Seguridade Social [INSS]*); and
(vii) Registration of the association at the Severance Pay Fund (*Fundo de Garantia por Tempo de Serviço [FGTS]*).

-COOPERATIVES-

The following steps must be taken to constitute a cooperative in Brazil:
(i) Holding a General Meeting of members to approve the cooperative bylaws. The General Meeting must indicate at least:**(a)** the name of the entity, main office and purpose of activities; **(b)** the name, nationality, age, marital status, profession and place of residence of the founding members who signed it, as well as the amount and number of the share of each one; **(c)** approval of the society bylaws; and **(d)**, name, nationality, marital status, profession and residence of the members elected to administrative, supervisory and other bodies. The bylaws must contain at least: **(a)** the name, main office, time of duration, sphere of action, object of society, fiscal year and date for the audit;

(b) rights and duties of the members and the nature of their responsibilities; **(c)** conditions of admission, dismissal, elimination and exclusion and the rules for their representation at generatl meetings; **(d)** minimum equity if any **(e)** value of the share, the minimum number of shares to be subscribed by the members, how they are paid for, and also the conditions of their retrieval in cases of dismissal, elimination or exclusion of the member; **(f)** how the surpluses will be returned to the members, or how the losses that occurred due to insufficient contribution to cover the society's expenditures are shared; **(g)** the mode of administration and supervision, establishing the respective bodies, with the definition of their attributions, powers and operation, active and passive representation of the society in court or outside it, term in office, as well as the process of replacing the administrators and supervisory councilors; **(h)** the formalities of calling the general meetings; **(i)** case of voluntary dissolution of the society; **(j)** the mode and process of sale or encumbrance of real estate belonging to the society; **(k)** way to change the bylaws; and **(l)** minimum number of members.

(ii) Registration of the cooperative at the Commercial Registry of the State in which the headquarters are;

(iii) Registration of the cooperative at the CNPJ/MF;

(iv) Opening a bank account for the cooperative;

(v) Registration of the cooperative at the appropriate City administration;

(vi) Registration of the cooperative at the National Institute of Social Security (INSS); and

(vii) Registration of the cooperative at the Severance Pay Fund (FGTS).

-AUTHORIZATION TO OPERATE-

In the Municipality of Rio de Janeiro, it is necessary to obtain permission to operate from the appropriate municipal body, in this case the City Administration, as per article 1 of Municipal Decree nº 30.568, of April 2, 2009.

-ESTIMATED COST AND TIME TO CONSTITUTE THE COOPERATIVE-

TABLE 2 shows **(i)** an estimate of the time needed to constitute an association and a cooperative, taking into account the phases described below; and **(ii)** an estimate of the associated registration and filing costs [39]:

	Association	
Phase	**Estimate of Time Needed**	**Costs**
(i)	Depends on the client	–
(ii)	Approximately 3 (three) business days	Approximately R$200,00
(iii)	Depends on the Federal Revenue Service (RFB) (approximately 15 days).	–
(iv)	Depends on the bank	–
(v)	Depends on the City Administration (approximately 2 business days)	–
(vi)	Depends on the INSS (approximately 2 business days)	–
(vii)	Depends on the *Caixa Economica Federal* (Federal Savings Bank) (approximately 2 business days)	–
	Cooperative	
(i)	Depends on the client	–
(ii)	Approximately 3 (three) business days	Aproximadamente R$200,00
(iii)	Depends on the Federal Revenue Service (RFB) (approximately 15 days)	–
(iv)	Depends on the bank	–
(v)	Depends on the City Administration (approximately 2 business days)	–
(vi)	Depends on the INSS (approximately 2 business days)	–
(vii)	Depends on the *Caixa Econômica Federal* (Federal Savings Bank) (approximately 2 business days)	–

TABLE 2 Estimate of time and costs to form an association and a cooperative.
Source: Elaborated by the authors.

As to obtaining an authorization to operate from the City Administration of Rio de Janeiro, the procedure may take up to 90 (ninety) days, from the date the cooperative is constituted, not taking into account possible delays by the government agencies.

[39] The estimated costs described in this memorandum refer only to government charges and do not include the costs of preparing documents and the appropriate measures to register them (lawyers' fees, accountants' fees, transport costs, etc.).

LAW OF SOLID WASTES

The rules contained in Federal Law n° 12,305, of August 2, 2010 – "Law of Solid Wastes" (BRASIL,2010 A) show that the government acknowledges the major role of cooperatives and other forms of associations of collectors of reusable and recyclable materials as agents of integrated management of urban solid wastes. These rules also establish the participation of these cooperatives and other forms of social entites connected to catadores of recyclable materials in the recycling process. The Law of Solid Wastes, however, does not guarantee specific rights or benefits to the catadores and their cooperatives or associations, it can only establish guidelines to formulate a public policy on the subject.

For the same purpose, Decree nº 7,404, of December 23, 2010 was also published - "Decree" (BRASIL,2010B). However, as regards the recyclable materials collectors, the generic language was maintained. Article 40 mentions that the solid waste selective collection systems and reverse logistics will prioritize the participation of catadores' cooperatives and associations. Article 40 also establishes that the Federal Government should use specific regulations to draft a program to support the catadores.

The Law of Solid Wastes and the Decree establish major concepts for the activity of the catadores, such as Reverse Logistics and Shared Responsibility:

-REVERSE LOGISTICS

An ensemble of actions, procedures and means aiming to enable the collection and restitution of solid wastes to the entrepreneurial sector, for reuse, in its cycle or in other production cycles, or another environmentally appropriate final disposal.[40]

-SHARED RESPONSIBILITY

Ensemble of attributions of manufacturers, importers, distributors and vendors, consumers and holders of public urban cleaning services and management of solid wastes, to minimize the volume of solids wastes and rejects generated,

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[40] Art. 3º, VIII, art. 31, IV and art. 33, of Law 12,305 of August 2, 2010 and art. 18, heading and § 1º, art. 19, §3º, art. 23, IV, art. 28, VI and arts. 40 to 44, of Decree nº 7,404 of December 23, 2010.

and also to reduce the impacts caused on human health and environmental quality as a result of the product life cycle.[41]

The Law of Solid Wastes foresees that the Government can institute inducing measures and lines of finance to meet, among other priority purposes, initiatives to implement physical infrastructure and the acquisition of equipment for cooperatives or other forms of association of reusable and recyclable material collectors.[42] However, there is no concrete forecast in law to implement such measures.

LEGAL RELATIONSHIP WITH LARGE CORPORATIONS -NEED FOR STANDARD CONTRACTS

Considering the overview established by the Law of Solid Wastes which determines participation of manufacturers, importers, distributors and vendors in the direct responsibility for the recycling and disposal of their products, and also the inclusion of the recyclable material collectors in the waste recycling chain, it is essential to systematize and professionalize the relationship between these workers and industry.

It is, thus, important to elaborate standard contracts to be signed with the companies, containing clauses that will give cooperatives and industries assurance, for instance, establishing a minimum amount of product to be supplied and/or purchased, during a given period. Considering the complexity of such contracts, we believe that it would be very useful to have the association proposed here as part of the Project to develop and act as intermediary in the negotiation of such contracts, which could be replicated throughout the country by other cooperatives and industries.

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41 In this sense, it is the head of the public services of urban cleaning and management of solid wastes to adopt procedures to reuse the reusable solid wastes who must establish the selective collection system and articulate with the economic and social agents to make it possible to return to the productive cycle the resuable and recyclable wastes coming from urban cleaning services and the management of solid wastes..

42 Art. 42, III, of Law 12,305 of August 2, 2010.

FISCAL BENEFITS FOR BIG INDUSTRY

-DONATIONS TO NON-PROFIT ORGANIZATIONS

As long as some requirements are obeyed, donations to non-profit organizations can be accepted as deductible.[43]

-ECOLOGICAL ICMS

The legislation of the State of Rio de Janeiro (State Law nº 5,100, of October 4, 2007) determines that a percentage of the product of the ICMS (State Value-Added Tax on Services and Circulation of Goods) be given to municipalites based on the criterion of environmental conservation (*"will be of 2.5% subtracted from the total amount distributed to the municipalities according to Law nº 2,664/96"*). This is called the "Ecological ICMS".

State Decree nº 41,844, of May 4, 2009, establishes technical definitions for the allocation of the percentage to be distributed to the municipalities because of the "Ecological ICMS", emphasizing the importance of appropriate treatment of solid wastes. Namely:

"Art. 1º. The percentage to which article 2 of Law nº 5,100 of October 4, 2007 refers, will be apportioned as foreseen in § 2 of the aforementioned article, in the following proportion:

I – 45% (forty-five per cent) according to criteria involving the existence and effective implementation of protected areas;

II – 30% (thirty per cent) according to criteria related to the environmental quality of the water resources;

III - 25% (twenty-five per cent) according to criteria related to the appropriate final disposal of the solid wastes" (our italics)

Thus, municipalities, to receive a given percentage of the product of ICMS collection must adopt environmental conservation policies, including a responsible policy for the final disposal of solid wastes.

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[43] See requirements in article 13 of Law nº 9,249, of December 26, 1995.

-PRESUMED CREDIT ON IPI (EXCISE TAX)

The industrial establishments that acquire some specific types of solid wastes from cooperatives of catadores of recyclable materials in which only people participate, not legal entities, and who use these materials as raw materials or intermediate products in manufacturing their products, will merit, until December 31, 2014, a presumed credit of the Federal Excise Tax on the Manufacturing of Goods (*IPI*). The amount of presumed credit accrued will vary according to the solid waste sold.

Among the solid wastes that will enable the concession of that credit we highlight the following: wastes and clippings of plastic; paper or card for recycling; wastage and wastes of aluminum; and shards, fragments and other wastage and wastes of glass. The presumed credit can only be used to discount from the IPH owed when products that contain such solid wastes leave the industrial establishment.

FINAL CONSIDERATIONS

This document does not propose to be a full and complete description of the structure and taxation of non-profit entities in Brazil. It only proposes an initial direction for the Project, which can contribute to overcome major gaps in the Law of Solid Wastes that mostly excluded the collectors of recyclable materials from a process that tends to the industrialization of the procedures of collection of solid wastes in general, and, potentially, the elimination of the economic activities of such workrs. Given the complexity of this topic, further reflection, details and information will be required.

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SHARING PRACTICES

RECYCLING AT THE INTERSTICE OF INTERSECTORIAL RELATIONS: THE NATIONAL POLICY OF SOLID WASTES AND CHALLENGES FOR THE SOCIAL, PRODUCTIVE INCLUSION OF PICKERS

ARMINDO DOS SANTOS DE SOUSA TEODÓSIO
SYLMARA LOPES FRANCELINO GONÇALVES-DIAS
MARIA CECÍLIA LOSCHIAVO DOS SANTOS

The article analyzes the insertion of pickers into the dynamics of waste management governance. Public policies connected to managing solid wastes have undergone major transformations in contemporary Brazilian reality, ranging from the approval and implementation of a new regulatory framework on waste disposal, which aims at eliminating the so called “garbage dumps”, social inclusion and the economic emancipation of the pickers, to the actions of environmental movement and non-governmental organizations so as to incide on the dynamics of sustainability in the cities.

In recent years, Brazil has advanced significantly in issues involving solid wastes (RS), especially by enacting Law 12,305/2010 – the National Policy of Solid Wastes (BRASIL, 2010). In general, this law regulates the solid waste sector and provides new challenges and responsibilities for society as a whole and particularly for public and private authorities.

The Brazilian case is also outstanding for the relevant presence and action of actors of civil society, the State and the market in the policies and solid waste programs, operating and about to be implemented, configuring a field of disputes, convergences, conflicts, partnerships and risks in the construction of governance and sustainability of the territories.

Brazil has some of the oldest and most relevant operating pickers associations, whose emblematic cases are those of Coopamare [*Cooperativa dos Catadores Autônomos de Papel, Aparas e Materiais Reaproveitáveis*] and of the *Associação de Catadores de Papel, Papelão e Material Reaproveitável* [*ASMARE*], that have achieved international recognition as relevant experiences in the field of solid waste management and increasing the rights of populations in a state of social vulnerability. The recyclers' movements of Brazil also play a central role in the construction of collective actions such as the Recycling Cooperative of the Pickers of the Solidarity Economy Network [*Cata Unidos - Cooperativa de Reciclagem dos Catadores da Rede Economia Solidária*], CataSampa Network [*Rede CataSampa*], National Movement of the Pickers of Recyclable Materials [*MNCR - Movimento Nacional dos Catadores de Materiais Recicláveis*], and even National Movement of Street People [*Movimento Nacional de População de Rua*], who try to incide on the dynamics of urban governance, especially in the agenda of solid waste management, with the support of international non-governmental organizations.

On the other hand, local public policies on solid waste management have undergone significant changes, as new parties come to power at the level of municipal government, as well as state and federal levels. In this sense, articulations between organizations that represent the pickers and the municipal government appear to have gone back in some Brazilian cities in which the various conquests in terms of social and productive inclusion of the pickers occurred in the past, new policies of solid waste management are being implemented, with major consequences for urban govenance. In an attempt to find ways to implement the *PNRS*, Public-Private Partnerships have been considered by some state governments and city administrations as the best alternative for the management of urban wastes. These governance schemes based on partnerships, often involve large multinational corporations that can collect and treat wastes on a large scale, by using controversial waste treatment technologies, such as incineration.

The presence of market actors in the governance of solid waste management is also another very relevant aspect, not only because of the centrality that is ascribed to them in the operation of partnerships for solid waste management, but also several corporations from other sectors of activity, such as beverages and foodstuff, have broadened their participation in projects with a view to disseminating the collection and recycling activities, involving pickers significantly in the last few years.

Layrargues (1998) points to the need to rethink the interactions and assumptions that delimit the market, civil society and the state sphere, based on ecodevelopment:

> *"More than speeding up or reducing the rate of growth, the proposition of ecodevelopment means a true change of the direction of current civilization. It says that the market is not in a state to function on its own, without any regulation by State or organized society in political instances."* (P. 143).

Although many consider that civil society can take on several roles that were formerly limited to the State in providing policies, including the environmental ones, and that, therefore, it would be an alternative to the operational incapacity of governments to promote sustainable development (MORALES, 1999; PEREIRA ; GRAU, 1999), to think that organized civil society really and efficiently manages to face up to environmental challenges, overcoming the government and market spheres is to also ascribe exagerated and/or idealized capacities and powers to one more of the spheres that constitute life in society, and that, as the two other fields, carries in itself the possibilities of advancement and also serious embarrassments to the ideals of sustainability (FARRINGTON ET AL., 1993).

Even so, it is essential to analyze the dynamics of interaction that are established between the different actors that compose these spheres of life (State, market and civil society), as well as their implications for environmental protection and social justice, seeking to understand how and why they can favor sustainability and in what form, where and why they do not do so (GONÇALVES-DIAS; GUIMARÃES; SANTOS, 2012; RIUL; SANTOS, 2010).

Analyzing the reconfiguration of the dynamics of urban solid waste governance based on the relations between actors of civil society, State and market, a number of questions arise about the prospects and threats to the insertion of pickers into this reality. In this sense, several questions are enunciated and prove central in the encounters and disencounters that have occurred successively among pickers, advocacy movements for the pickers' interests, government agencies and businesses, such as: Are the pickers' cooperatives capable of economically feasible management of urban solid wastes? Have the National Movement of Pickers of Recyclable Materials and the National Movement of Street People managed to keep and expand their participatory spaces in the management of solid wastes? Are the enterprises of solidarity and inclusive recycling able to promote consistent sustainability processes in the cities?

All of this reality is marked by advances and threats, conquests and pitfalls to ensure dynamics of urban sustainability that can, simultaneously, generate the preservation of the natural resources, less environmental impact, reduction of social inequalities and economic inclusion, and expansion of the democratic governance of cities. Thus, it is more than urgent and necessary to analyze the situation of the pickers and their movements of representation of rights in urban governance, so as to best understand which are "turnaround movements", of relations between civil society, State and the actor in the market that the "turners" encounter ahead of themselves in the whirlwind of urban governance in Brazilian cities.

If, for several authors, the discussion about sustainability brings one to refounding ethics based on the parameters of what Leff (2006) calls environmental rationality, for others it requires an analysis of the notion itself of life in society, structured into different spheres, questioning the constitutive nature and the rationality of the different actors, institutions and organizations that operate in the spheres of the government, markets and civil society. The analysis of the Brazilian case can serve not only to generate new fronts for debate and academic discussion of the management of solid wastes and the guarantee of rights for populations in a situation of socioenvironmental vulnerability, it can also supply more information for the important debates and clashes between the social actors involved in the configuration of this dynamic of urban govenance.

GOVERNANCE AND NON-GOVERNING OF SOLID WASTE MANAGEMENT

The solid waste management (SWM) governance is increasingly important due to the possibility of constructing mechanisms for cooperation between different social actors, namely governments, organizations of civil society and enterprises, to recover or reuse materials that were previously considered useless and without commercial value. The term valuing of wastes arises in this context as the economic result of the process of adding value to the products and materials post-consumption.

Valuing solid wastes can be defined as the capacity of a productive chain to use the wastes as raw material. Instead of sending apparently useless items or routing co-products to a sanitary landfill, the purpose becomes to find

a useful purpose for these wastes. Reuse or recycling activities help enterprises to save resources and spare the environment by means of the appropriate disposal of the USW and a possibility of new uses. Thus, the minimization of the impact of a product or material will help ensure the quality of the environment and, at the same time, human health.

Although the *PNRS* encourages waste reduction techniques through public policies for a change of behavior, the total elimination of wastes is not yet a fact. Meadows et al. (1992) recall that for every ton of garbage generated by consumption, twenty tons of wastes are generated by the extraction of resources and five tons of garbage are generated during the industrialization process. Different countries have encouraged the use of recyclable materials as a means of dealing with the waste generated at urban centers and also by industrial activities. However, in this thematic universe, technical and commercial alternatives have not always been found for the complete reuse of wastes generated. A significant advantage in economic and environmental terms is the possibility of reinserting post-consumption wastes and material into productive chains, which then consider them as secondary raw materials by using separation, pre-processing and elimination techniques.

Recyclable waste is used as a secondary raw material by a variety of organizations, including waste generators from the private sector, government agencies, recycling organizations and brokers of recyclable materials. These flows are different in terms of service area, materials exchanged, change processes, cost structures, technological processes and business models. Some are very broad and deal with a large variety of materials.

In order to achieve integrated waste management it is therefore necessary to distinguish three groups of social actors that are interlinked in the solution of this problem:

(i) the public authorities that establish public policies for waste management and the taxation of the productive chain;
(ii) the population that must be informed of the benefits of prevention, recycling and elimination of wastes;
(iii) the private sectors, through the production chain, that can develop strategies and tactics to administrate the process of recyclable waste inversion.

Interaction between enterprises, society and the environment modifies the assumptions about management and performance. Given the context of growing environmental degradation, it has become necessary for the enterprises to understand susceptibility as a strategic matter,

intrinsically connected to the daily operations of a corporation. Thus the aspects of organization management in relation to sustainability are of great interest to academics and managers who work in the supply chain.

The scarcity of natural resources and the intensification of their extraction reinforce the need to research the value of solid wastes as a source of secondary raw materials. In other words, it requires a systemic view of the concept, through production and post-consumption, as opposed to the point of view of standard production of a specific product (SANTOS; PEREIRA, 1999). Some of these changes not only oblige companies to manage and approach a new topic, they also require changes in the pre-established practices, in order to create new production-consumption systems.

Literature confirms that regulatory mechanisms have received great attention as motivators of sustainability, since they are credited with having greater influence on the structure of companies that practice reverse logistics, which are directly affected by one or more interested parties: customers, suppliers, competitors and government agents. With the approval of *PNRS*, it became very necessary to develop environmental management systems and businesses focused on improving waste production and reuse processes. Besides, *PNRS* activities must be coordinated with those of the National Policy of Industry, as established by the federal government. Interdisciplinary approaches are, thus, necessary to confer greater security on the production chain, based specifically on the responsibilities established by the *PNRS* and implementation of the reverse logistics systems.

Another aspect to be considered in the *PNRS* is the demand for changes in taxation (double taxation, exemptions, and others), throughout the production chain, with a view to encouraging resuse and recycling, and taking into account the specificities of each product according to their respective materials and components. Chains in which recycling is mature and assured by its own market forces, as in the case of the aluminum cans, do not need incentive mechanisms. These incentives can be better used in chains whose process presents a certain weakness, such as *Tetra Pak* type packaging and plastics in general. Motivated by the institutional environment, investments in green products and technological processes along the supply chain have grown, as well as the pressure for companies to adopt environmental protection measures. However, governments and socio-environmental activities have historically been the most important elements to influence environmental practices.

On the other hand, some applications of reverse logistics are strictly focused, which makes them limited (GONÇALVES-DIAS; LABEGALINI; CSILAG, 2012). One of the main challenges of production chains is the capacity to predict waste generation and, thus, define the supply of resources to manage the reverse chain. The main authors on reverse logistics (DE BRITTO, 2004; DEKKER ET AL., 2004; 2010) consider the importance of establishing effective mechanisms to store, transport, process and manage the post-consumption of products and materials. Some of these alternatives become excessively expensive or inefficient due to to a few barriers, such as: deficient communication channels between the stages of reverse chains (those involving recovery and processing of products and materials post-consumption), the diversity of products and process standards, the absence of implementation of the proposal for ecodesign, as well as the lack of environmental regulations for the vast range of processes. However, a few interesting options for waste management have been proposed as solutions at the end of life of products, through the implementation of reverse logistics (POCHAMPALLY ET AL., 2008; CHERRET ET AL., 2010). Waste management, as part of reverse processes, appears to be a common sense among these authors.

It is known that the detailing of *PNRS* depends on agreements between the various production chains and also within them, to better define the model of collection, recycling and final disposal. In this context, design is a decisive element to establish these articulations. Considering these demands, the analysis of the production–consumption chain (SRIVASTAVA, 2007; VURRO, 2010) allows a systematic approach and relational thinking that are absolutely necessary at this stage of implementation of the law.

WASTE MANAGEMENT GOVERNANCE: THE FIELD AND THE ACTORS

In the field of solids wastes and recycling, three groups of stakeholders must be distinguished. They are formed by social actors who are interconnected to solve the problem:

(1) the authorities that can establish public policies for waste management and taxation of the production chain;

(2) the population that needs to be made aware of the benefits of reducing the garbage that is thrown away and of recycling;

(3) the production chain that can develop strategies and tactics to manage the reversion process from packaging to the production cycle. This chapter intends to discuss the topic from the intricate perspective of the multi stakeholders, considered specific actors of this organizational field: public sectors, non-governmental organizations, pickers' cooperatives, production chain, citizens and consumers.

The explanatory model of the spheres of society developed by Janoski (1998) and discussed by Vieira (2001), shown in **FIGURE 1**, allows a more appropriate discussion of the complex relationships of these *multi stakeholders*, present in different spheres of society, behind the new arrangements of solid waste management governance. This would occur because the approach incorporates different actors, interests, rationalities and values in interaction, without including or excluding certain organizations of the public sphere, based on assumptions about their contribution or not to expanding citizenship. In other words, it is not considered a pre-condition for acknowledging and analyzing the social actors whose values and actions are founded on democratic, participatory practices, connected to the public interest. Moreover, this conceptual scheme appears to offer more consistent analytic possibilities about the superpositions, reciprocal influence and expansion-retraction of the public spheres, State, market and private spheres in contemporary societies, and, especially when one analyzes the implications of the new arrangements of solid waste management governance.

According to Janoski (1998), the State sphere involves legislative organizations, as well as those of the judiciary and executive. But in the sphere of the market, besides private organizations there are also public companies engaged in generating income and wealth by producing goods and services. On the other hand, the private sphere involves family life and the networks of friendships, as well as the disposition of personal property.

The focus on institutions that operate the mediation of citizenship is very interesting to discuss solid waste management governances, a phenomenon that is constructed from different organizations, with a discursive appeal to the modernization of policies and socioenvironmental services directed at Brazilian citizens.

As Vieira (2001) emphasizes, the most relevant element in this conceptual table, and also the most difficult to identify, is precisely the public sphere, since it coves a myriad of organizations with differentiated characteristics. Janoski (1998) detects five types of organization in the public sphere:

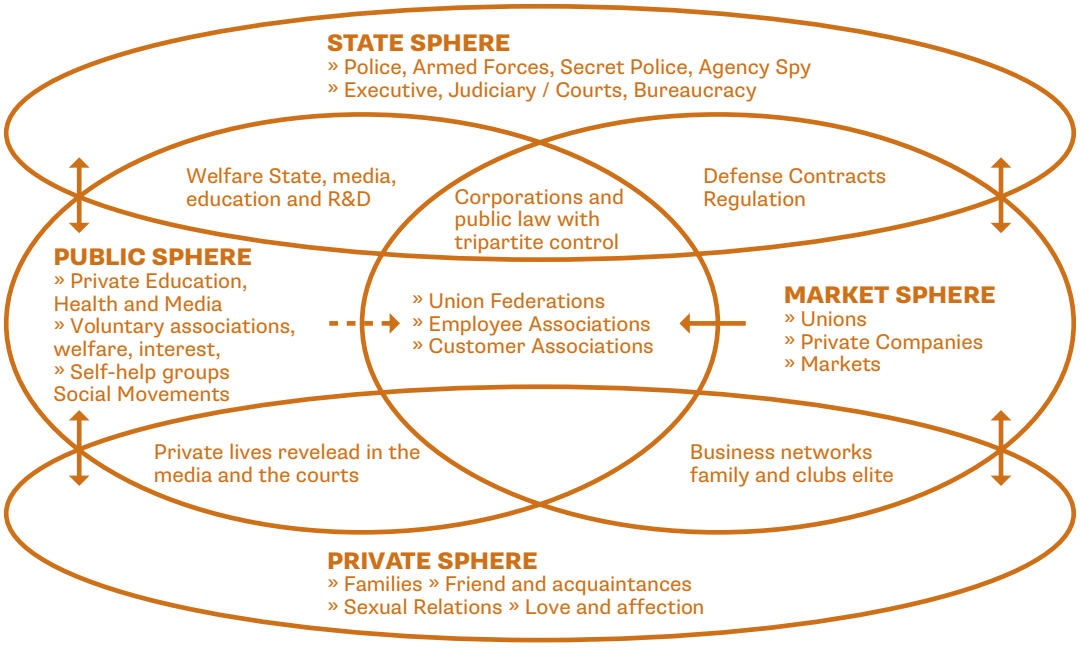

FIG. 1 Conceptual diagram of public spheres. Source: JANOSKI, 1998.

» Political parties, which, although they maintain a relationship with the State would not be submitted to the government entity in democratic regimes;
» Interest groups whose central role is influence on society and the legislative based on the interests of their respective groupings;
» Social welfare associations, such as schools, hospitals and charitable institutions which aim at promoting social welfare services;
» Social movements that use more informal methods to influence the formation of public agendas, such as boycotts, protests, and demonstrations;
» Religious groups that would be on the borderline of the limits of the public and the private spheres, except when they try to influence consensus formation processes in society or within the sphere of the state in favor of their beliefs.

This approach allows one to undestand the social action of different actors, originating in the State, the market and civil society, without conceiving their nature and practices as static or defined a *priori*, due to the field

or sphere in which they originate. This comprehensive model has a more consistent dialogue with the action of the actors, allowing one to understand to what extent they approach or become distant from their original fields, and how they approach or not the public sphere. As Vieira (2001, P. 68) points out, even the private companies are considered not only actors in the market, dominated exclusively by a mercantile logic, turning also to the public spheres: private organizations that *"intend to mold public opinion or influence legislative production as a function of their interests [...] and threaten the well-being of the communities or of societies. [...] Evidently, the limit between the private and public spheres is a contentious matter."*

Thus, one is now heading towards a relational comprehension founded on the action and rationality of the actors within solid waste management governance, since State sector organizations, for instance, can go to the public sphere and also remain more oriented towards the State sphere. For Vieira (2001), through a perspective of *checks and balances* between the four spheres (P. 69), the model proposed by Janoski (1998) would allow undestanding the power and control relations between the organizations of the State, civil society and the market. It should also be pointed out that this approach does not supply an idealized view of what the desirable composition would be of the spheres of life in society, sometimes projected as more State, market, public or private sphere. Even so, this analytic perspective allows dialogue with different currents that discuss relations between the State, civil society, and the market, and many of them are based on ethical and moral pressupositions about the desirable composition and action for these spheres, as certified by Seligman (1993).

Thus, sheltering different groups of institutional actors, assuming that the borders between the spheres are fluid and volatile marked by superposition, the model proposed by Janoski (1998) shows processes that would not necessarily lead to an expansion of the democratic and plural processes based on interaction between organizations of the State, civil society and the market. This is a relevant concern in several discussions on the expansion of the organizations of civil society in contemporary societies, as can be perceived in the discussions of Alves (2004), Landim (2002), Oliveira (2002), Montaño (2002), and Pérez-Díaz (1995). Moreover, these concerns reverberated in the different collaborative interactions established among the government actors, civil society and the market in policies and new governance arrangements, and are highly relevant to analyze the implications of the *PNRS* for solid waste management (SELSKY; PARKER, 2005; TEIXEIRA, 2002; BEBBINGTON, 2002; NAJAM, 2000; PEREIRA; GRAU, 1999; COSTON, 1998).

According to Selsky and Parker (2005), three main currents can be listed in studies on Public-Private Partnerships. The first of them called *Resource Dependence Platform* refers to the literature based on the principle that collaborations are basically the attempt to address problems faced by the organizations. From this perspective, partnerships are conceived as strategies developed by the organizations to solve their problems of access to resources and development of competencies and capacities. As Selsky and Parker (2005) argue, partnerships on this platform *"are conceived in a narrow, instrumental, and short-term way; they are viewed as a way to address organizational needs with the added benefit of addressing a social need"* (P. 852).

This first current comes close to the approaches of the so-called Resource Mobilization Theory (RM) about the emergence and dynamics of the social movements. For Gohn (2000), RM basically uses paradigms of economics, assuming that the organizations compete for resoures in markets where there are bargains and that are ruled by a utilitarist logic, along the lines of the assumptions of rational choice. Even the political dispute takes on the character of a market of political goods, which leads one to conceive organizations of society as interest groups, competing for all kinds of resources, namely, human, financial, infrastructure and communications, among others. Along this line, conflict is discussed based on the fundamentals of the collective action logic of Olson (1999), leading to the construction of typologies, such as that of Zald and McCarthy *apud* Gohn (2000), who classify the movements and organizations into two large categories: consensus and conflict. Cohen and Arato (1994) say that the concepts of organization and rationality are central in this approach. This appears to be one of the reasons to justify the significant presence of the fundamentals of RM analysis in many of the studies on partnerships in new arrangements of government of solid waste management, even if they do not consciously and deliberately assume the adherence of perspective centered on resources. Besides, several of these studies appear to offer little contribution to the critical advancement of the field of knowledge of Social Management.

The fundamentals that erect the perspective of Resource Mobilization arouse much criticism in the studies on the nature of the social action and rationality of the actors, above all when applied to the discussion of Public-Private Partnership. Operating on other more consistent explanatory bases to analyze the reality of the *práxis* of actors in phenomena of collaboration does not imply neglecting the relevance of resources as factors present in this dynamics. On the contrary, resources are relevant, but as relevant as the resources are the meanings, resignifications, institutions and non-linear

power games which are constructed in realities that involve resources.

The second current, usually found in studies on Intersectorial Partnerships, would be the so-called *Social Issues Platform*. From this perspective, collaborations between the State, organization sof the public spheres and the market would be the result of the convergence around socially constructed metaproblems accepted as relevant by the actors. At the origin of this dynamics would be the gaps between expectations and performances of organizations when dealing with turbulence in the environment, which would be unexpected but very frequent. As Selsky and Parker (2005) point out, differently from dependence on resources, in which one assumes that organizations aim primarily at their own interest and only later focus on social issues, in the *Social Issues Platform* fundamentally the organizations aim at addressing the social metaproblems, and from this perspective, the partnerships would appear and be designed from this central motivation and perspectives.

In the approaches of the *Social Issues Platform* there is a major reference to the voluntary character of Public-Private Partnerships. As discussed previously, the social action constructed by the actors in collaborative practices is permeated by valorative notions and interests and steeped in ideals of social transformation, on the contrary of being marked strictly by self-interest.

However, when one discusses topics related to the expansion of citizenship, participatory democracy, ethics in management and social responsibility, it is very common to find idealized discourses that reproduce social constructions, ruled in the consensus about the importance of expanding ethics and democracy. These discursive idealizations can, deliberately or not deliberately, cloud the critical perception of ongoing collaborative processes, as well as neglect the mosaic of interests, values and rationalities that are built in a non-linear form in the social action that marks the Public-Private Partnerships. Therefore, the relevance of the alignment of actors around metaproblems should not be neglected, but also go beyond the circumscription of the analysis of this dimension, under pains of not advancing comprehensively in the analysis of collaborative processes involving organizations of the State, civil society and the market in the new arrangements of urban solid waste management governance which are being implemented since the *PNRS*.

Finally, Selsky and Parker (2005) list the so-called *Societal Sector Platform*, that is supported by the perspective that relationships between State, businesses and organizations of civil society operate according to new principles and obscure the limits between the three sectors. This superposal and attenuation of boundaries would occur above all when an organization from a given sphere adopts or captures roles traditionally associated with the dynamics of action

and rationality of actors from another sphere. For the authors, such phenomena would lead to real hybrid governance processes and the emergence of hybrid organizations or interorganizations. Among the most relevant factors, as drivers of the Public Private Partnerships through the literature produced by this current of discussion are references to the reduction of government funding for the new arrangements for solid waste management governance developed by OCSs (RIUL; SANTOS, 2010), leading to the uptake of resources via the commercialization of products and services, the weakening of the capacity of governance of the organizations of the State, forcing them to share in providing public services through entrepreneurial and civil society organizations, and to the pressure of interest groups on the entrepreneurial activities on a global scale, leading the corporations to insert topics and practices connected to citizenship into their management policies. In this way, the discussion of the boundaries between the public, State and market spheres, as well as the roles and rationalities of their organizations deserve to be analyzed slowly, identifying and discussing the structural phenomena that would mark the relations between the social actors of different spheres and the forms of interaction, ie, of governance that are constructed.

An initial analysis of the actors and spheres of society involved in *governance of urban solid waste management*, based on the transformations originating in the National Policy of Solid Wastes, allows using the model proposed by Janoski (1998) to indicate the following configuration (**FIGURE 2**):

The approaches within the *Societal Sector Platform* are part of this dimension and allow the problematization of a series of relevant phenomena that mark the Public-Private Partnerships in the solid waste management governance, including those connected to the construction of references and shared meanings as to the rise or not of a new field of public policy management, social and productive inclusion of pickers and generation of socioenvironmental business, located in the gray areas of intercession and superposition of practices of the actors involved in collaborations. Besides, this discussion supplies important vectors of analysis about the traditional roles of each actor in their sphere and power games involving the change and/or permanence of their *práxis*, towards encounter or disencounter with organizations of other spheres marked by different rationalities and practices. However, it appears more productive and consistent, theoretically, not to analyze Public – Private Partnerships of solid waste management governance based on excluding or dichotomic perspectives of analysis, but rather consider the central elements of the three lines of approach, namely, *Resource Dependence*, *Social Issues* and *Societal Sector*.

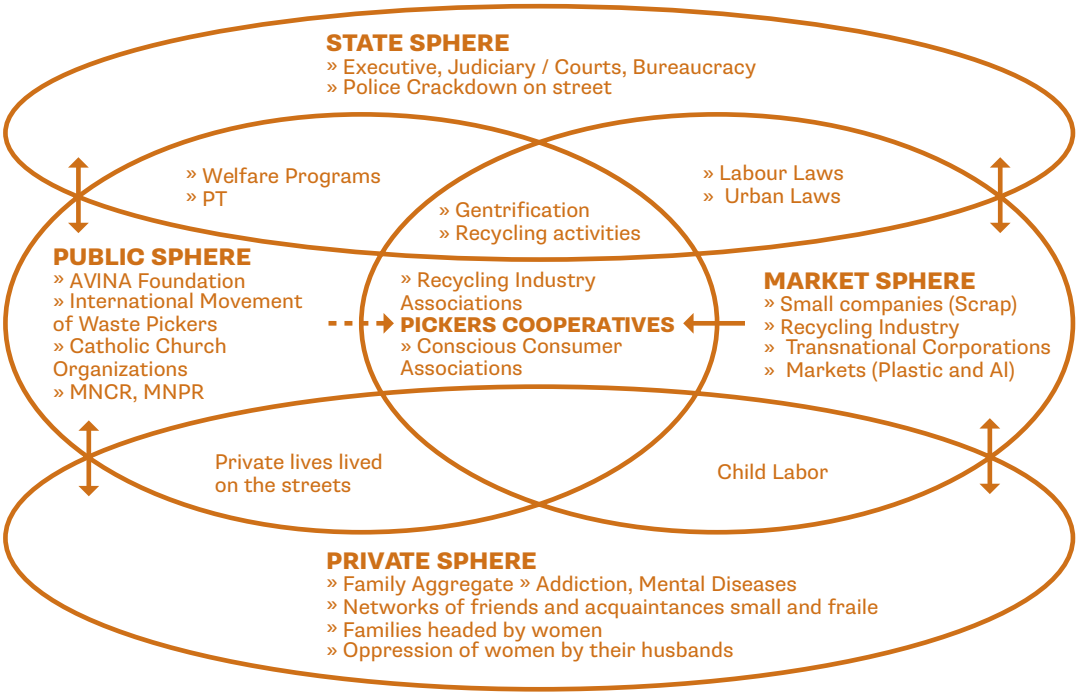

FIG. 2 Waste Pickers on the Social Spheres in Brazilian Cities. Source: TEODÓSIO ET AL., 2013, P. 56.

PICKERS IN SOLID WASTE MANAGEMENT GOVERNANCE: PROSPECTS AND PITFALLS

Although much of the literature celebrates the good possibilities of modernization to provide social policies through Public-Private Partnerships, several studies also point to risks and pitfalls resulting from the meeting between actors of civil society, State and market. Vernis et al. (2007) point to the problems resulting from the existence of *"ilegitimate associations"*, while Meirelles (2005) indicates the pitfalls resulting from the asymmetry of power in established relations. Many elements that are enumerated as indicating an advance in the management of policies and new arrangements of solid waste management *governance* through Public-Private Partnerships may at the same time and paradoxically become barriers against this modernization itself. An example of this is presented by Najam (1996) when analyzing the efforts

to expand social control over governmental and non-governmental agencies, and discuss the implications resulting from *accountability* practices that may be increasingly referenced by the *ethos* of public bureaucracy or the technicalities of OCSs, so that the organizations become distant from the communities and public served by the policies and result in a new arrangement of solid waste management *governance*.

The possibilities of constructing new forms of relationship on less conflictive foundations (or more cooperative, as most of the literature prefers to emphasize) among State, market and organizations of civil society, lead to more advanced forms of constructing citizenship and social and productive inclusion of the pickers because of the Public-Private Partnerships in solid waste management (TORO, 2005; YAKOVLEVA; ALABASTER, 2003). Other analyses of Public-Private Partnerships also point to gains from the sum and complementation of resources and competencies (SELSKY; PARKER, 2005; PREFONTAINE, 2000), effectiveness and expansion of the impact of interventions in social problems (VERNIS ET AL., 2007; PREFONTAINE, 2000), co-responsibility for social transformation (DOWBOR, 2002; MORALES, 1999), increased level of information and predictability related to social risks (VERNIS ET AL., 2007; SELSKY; PARKER, 2005) and shared learning (FISCHER ET AL., 2003; NAJAM, 2000), constituting relevant elements that would justify expanding inter sectoral collaborations.

However, Selsky and Parker (2005) identified several studies that point to mixed and even *counterproductive outcomes* regarding Public Private Partnerships, especially when one analyzes the impacts in terms of expanding the citizenship and the social and productive inclusion of populations in a situation of social vulnerability and extreme poverty. Vernis et al. (2007) acknowledge that pragmatic, economic, ideological, commercial and populist motivations may be behind the discourse of shared governance. These risks appear to be behind one of the greatest problems encountered in the materialization of the partnerships in new arrangements of solid waste management governance, the reciprocal governance reinforcing prejudices, rejections and defensive attitudes among the actors. (MEIRELLES, 2005; FISCHER ET AL., 2003).

It can be seen that some of the difficulties encountered by Public Private Partnerships in fulfilling their promises, whether it be in terms of providing socioenvironmental services or the construction of more advanced dynamics for democratic and citizen interaction in societies, is due to problems of operating or managing these collaborative practices. A substantial part of the literature on alliances and colaborations in new arrangements of solid waste management governance is dedicated to overcoming problems

connected to low transparency as interests and implicit objectives at stake, reduced alterity or lack of knowledge of the other partner, non existence of agreed rules for conflict solving and precariousness of the instruments to monitor and evaluate the social interventions (MEIRELLES, 2005).

However, more relevant than the problems inherent to a good "oiling" of the operation of collaborative practice, many of them common to the partnerships between State, civil society and actors in the market, which can be improved by the voluntarism of the actors involved and by the development of management instruments, appear to be the challenges related to the structuring dynamics of cooperative relationships. The latter dimension recalls the dilemmas faced by the actors regarding the cooperation and confrontation games, marked by power and dominance relations in the social action, uncovering realities that, on the contrary of being possible to overcome, are constituent and structuring in the very partnership processes.

Several authors refer to cooptation as one of the great risks of Public–Private Partnerships. Najam (2000), analyzing relations between NGOs and governments, presents four possibilities of interaction that he calls "The Four Cs". This model crossmatches the actors' objectives with strategies of preferential actions. Confrontation practices are expressed when substantial differences exist in these two dimensions. Relationships, characterized by complementarity would appear when objectives are similar, but the action strategies are different. Cooptation would occur when strategies and objectives converge. Finally, cooptation would be constructed when significant differences, in terms of objectives, coexist with convergence, as to the forms of action.

Analyzing interactions between non governmental organizations and government agencies in the United States, Ospina and Saz-Carranza (2005) identified dynamics in which the same individuals and institution sometimes establish positions of coalition and reciprocal support in the dispute for definitions of public policy agendas, at other times spell out their divergences and antagonize each other on several fronts of these same policies. According to Najam (2000), the model of the *Four Cs* of analysis does not have the existence of symmetry of power between the actors imbricated in the partnership as a previous condition for cooperation, but can help understand a number of situations in which the non governmental actors, whether OCSs or businesses, present themselves as relevant actors in interactions with the State. The situations of confronttation would appear both in realities in whch the non-governmental actors resist and /or oppose given polities published, and in the cases in which coercitive controls are manifested by the State.

But, as the author emphasizes, confrontation dynamics *"need not necessarily be hostile"* (P. 386), which creates a space to acnowledge less evident conflicts and conflictive forms of interaction, not necessarily explicit and declared, in these relationships.

Coston (1998) identifies seven situations of interactions between government and NGOs analyzing the variables degreee of acceptance of institutional pluralism, level of formality of relations and symmetry of power among the actors. In contexts with strong asymmetry of power and resistance to the plurality of organizations and institutions, interactions would be characterized by repression, rivalry or even competition, and the first two can be formal or informal in nature, whereas the competitive dynamics would take on an informal character. On the other hand, in realities marked by a greater acceptance of institutional pluralism and less asymmetry of power, formal relationships of employment and outsourcing would appear, informal ones of cooperation, and again, more formal with complementarity and collaboration.

In this theoretical construct, expressions usually found with multiple meanings and references in the literature appear with very precise definitions. In the situations of repression, the government refuses to provide any kind of support to the non-governmental organizations, whereas, in positions of rivalry, the government policy develops regulations that are unfavorable to the NGO operation, aiming at controlling them directly. On the other hand, in the sphere of competition, political fighting can occur for support of society and/or the communities and/or economic, with disputes for international funds and/or community contributions. In employment a division of labor occurs based on comparative advantages, leading to the disappearance of the boundaries between the sectors, whereas in third party type relations (outsourcing), the discretionary power of the State over the NGOs occurs, by means of the division of labor, based also on comparative advantages that are not manifested by means of different, more precise mechanisms to regulate the activity of non-governmental organizations.

According to Coston (1998), both employing and outsourcing carry potential negative consequences for the NGOs, especially those connected to the distortion of their objectives and values and the loss of legitimacy in the eyes of society. In the sphere of greater acceptance of institutional pluralism, cooperation appears, marked by low interaction among the actors and by the non-formal sharing of information; the complementarity in which sharing of knowledge and of resources of another nature would be higher, creating possibilities of NGO participation in planning the public policies; and, finally, collaboration, characterized by a high degree of interaction among the actors,

formalized procedures for the common use of information and other resources, and the participation of NGOs in the stages of construction, implementation and evaluation of public policies.

Selsky and Parker (2005) highlight that several dynamics and characteristics expressed in Public-Private Partnerships contain positive and negative aspects, possibilities and pitfalls, senses of trust and risk, optimistic and pessimistic views, the wish to collaborate and resistance, and also openings to new learning and prejudices are brought by the actors to the intersectorial interactions due to their previous experiences in *one-by-one* articulations.

Although the Coston model (1998) reproduces the same problem of evolutionary linearity present in Naja,'s discussions (2000), due to the *continuum* between different situations of interaction among the actors, this analytic construction presents a greater or lesser adherence to institutional pluralism as a background. This perspective allows one to consider variables connected to the sociopolitical trajectory of societies and their implications for the deployment of Public-Private Partnerhips about *"intangible and indirect outcomes"* (SELSKY; PARKER, 2005, P. 863), in other words, it enables the discussion of concrete management issues of the new arrangements for solid waste governance, but especially about the expansion of citizenship, the construction of rights and the social and productive inclusion itself of the pickers, the central subject of this investigation.

Outstanding in these debates are, on the one hand the desire to build partnerships, many of them drivem by need, conscious or not, explicit or not, for raising resources, as well as mistrust and the fear of an ultimately excessive incorporation of the rationality and *ethos* of the actors from other spheres involved in the collaboration, changing the character of the identity of their organizations.This picture appears to constitute what coould be called a true collaborative schizophrenia, in which one aspires to and dreams of partnership, at the same time as one fears and repudiates it.

At the same time as the turn to the Public-Private Partnerships, with dedication and the wish to materialize consistent, lasting practices, they express stereotyped views about the rationality of the organization of other spheres different from theirs and resistances to a possible incorporation of logics centered on others spheres. Thus, there are fears that things will possibly become bureaucratic and routine as a result of the transmutation of statecentric logics of social management or of entrepreneurialism of solidarity recycling enterprises. On the other hand, in turn, actors of the State and of the marketin their discourses reinforce the dimension that they are not

organizations of civil society and to not claim to be such.

There seems to be less resistance to perspectives toward the convergence of efforts to strengthen a democratic and plural public sphere, since it contains ideals considered politically correct and appropriate for the modernization of social policies such as expanding popular participation in the management of new arrangements for solid waste governance. However, criticism also arises, and for given actors, self-criticism of their own mediation operated by their organizations, above all those of civil society, when they represent the interests of social groups in a situation of social vulnerability and poverty, the situation, unfortunately, of many among the picker population in Brazil. All this results in a complex mosaic of everyday construction of the Public Private Partnerships for solid waste management, very far from the linear, idealized perspectives in the managerial literature about collaborative practices in new arrangements of waste management governance which list well-delimited stages and sequential processes of improvement of the collaborative processes. Besides, visibly the consequences of Public-Private Partnerships on constructing a more democra-tic public sphere and on social and productive inclusion of the pickers are uncertain, non linear and non-predictable, and this practice of collaborative articulation may result in withdrawal from advances achieved so far by this group of workers.

Despite the convergence of discourses concerning the relevance of social and environmental problems, attacked by the policies, programs and projects for the social and productive inclusion of pickers, ideological divergences are expressed within the solid waste management governance processes. This denotes not only that dynamics of resistance to transmutation or transformation in the other actor, by incorporating his rationality and *ethos*, are relevant in this process, but that actors also manage to develop develop dynamics that go beyond these differences, so as to operate collaborative initiatives. These ideological divergences appear to become more relevant and have a greater impact on sustaining programs and projects over the long term, especially when one considers the insertion of government actors, who may alternate politically in power, which may also incur changes in the ideological concepts that guide the policies of certain governments.

One of the risks involves the development of approaches that are excessively focused on building consensus, relegating social conflict to a secondary position or establishing a concept of sociability in which the conflict would be seen as undesirable, dysfunctional, or even a remnant of an anachronism of the social struggles of the past, marked by intense ideological polarization

among the social groups. On the contrary of a victimizing view of the pickers, which deep down carries the traces of assistentialist centralism, may lead to construct itself as a reference for social management, it is in the sphere of *práxis* and of everyday life of the pickers in the places that the policies and new arrangements of solid waste management governance materialize, and there are no consistent data to stereotype local actors as mere recipients and disseminators of logics that were constructed exogenously. On this front, there are possibilities and threats of social transformation towards a more democratic public sphere.

The dissemination of local realities of the Public Private Partnerships agenda for the management of solid wastes may result in a centralized action towards the local areas, reproducing classical problems of several public and private initiatives for action, about socioenvironmental problems of the localities, and also lead to new forms of plural and more democratic interaction among actors of the State, market and civil society in the public sphere. The latter perspective is even more relevant when one finds that, on the contrary of what concepts, based on sructural views self-referenced in the dynamics of the great centers of power often construct about local realities, these spaces are decisive for the effectiveness and impact of social and environmental policies, and carry both the potential for social transformation and the dilemmas and pitfalls of the capture of the innovations by traditional and conservative solid waste management formulas (GONÇALVES-DIAS, 2009; SANTOS; GONÇALVES-DIAS, 2012; TEODÓSIO ET AL., 2013).

A more detailed look at these efforts to modernize social management reveals pitfalls and paradoxes. The literature on Public-Private Partnerships in solid waste management, very scarce and produced mainly by development agencies, focuses excessively on the mechanisms of building partnerships, mainly by approaches looking at the interpersonal relations of cooperation between representatives of the State, civil society and the market. Although these variables are important in the partnerships, they are not the most rele-vant, and indicate an excessive concentration of concerns on the partnerships themselves, to the detriment of their consequences on the public sphere and the construction of citizenship.

CHALLENGES OF SOCIAL AND PRODUCTIVE INCLUSION OF THE PICKERS IN SOLID WASTE MANAGEMENT

The main focus of solid waste management in the last few years has been regular collection, as per data from *PNSB-2008*. The rate of coverage has gradually grown, in 2009 reaching almost 90% of the total number of domiciles. In the urban area, the collection is greater than the 98% index; however collection from domiciles in rural areas has not yet reached 33%. As to the selective collection of recyclable materials, between 2000 and 2008 there was a 120% increase in the number of municipalities that develop these programs, already 994, located mostly in areas in the South and Southeast regions. Although this growth is important, it still does not cover more than 18% of the Brazilian municipalities (IBGE, 2010; IPEA, 2012). The analysis of the quantity of material recovered by such programs indicates the need to continue. Estimates point out that the participation of the wastes recovered by the formal selective collection programs is still very small compared to the total collected, which indicates that recycling in this country is still maintained by informal post-consumption collection, especially by the recyclable materials pickers (IPEA, 2012) (see **TABLE 1**).

Wastes	**Quantity of wastes recycled yearly** (thousand t/year)	**Quantity recovered by official selective collection programs** (thousand t/year)	**Participation of formal selective collection in total recycling**
Metals	9.817,8	72,3	0,7%
Paper/ Cardboard	3.827,9	285,7	7,5%
Plastic	962,0 *	170,3	17,7%
Glass	489,0	50,9	10,4%

Note: * Information from 2007.

TABLE 1 Estimate of the participation of formal selective collection programs (2008). Source: IPEA, 2012.

It should be mentioned that the pickers occupy an essential position in the field of recycling in Brazil insofar as their existence reflects the difficulty of the intermediaries to integrate picking into their activities. This is due to problems of production scale, together with logistic difficulties (GONÇALVES-DIAS, 2009). This group of workers acts infomally or in an organized manner in cooperatives, and even before the definition of clear public policies for waste management in the country, has performed a very important environmental job.

The pickers contribute significantly to the return of different materials to the production cycle, generating a saving of energy and raw material and preventing the recyclable materials from being sent to landfills.

Despite the infrastructure deficiencies in Brazilian cities, it is mostly the informal recycling chain that manages to reinsert this material into the production processes. Thus, the pickers have responded to the complex challenge of the large cities in the management of solid wastes at the beginning of this century. The mobilization of thousands of pickers around the National Movement of Recyclable Materials [*MNCR-Movimento Nacional de Catadores de Materiais Recicláveis*] for the approval and implementation of the National Policy of Solid Wastes, Law 12,305/2010 (BRASIL, 2010), and heir action in the Interministerial Committee for the social inclusion of recyclables pickers also proves that this group is a major protagonist of the recycling industry in this country.

There are no precise data about the number of pickers in Brazil; different sources present distinct estimates. The National Research of Basic Sanitation of 2008, whose data are informed by the municipal administrations in the country, identified 70,449 recyclable material pickers. Of this total, attention is called to the fact that there are 5,635 children under the age of 14 years (IBGE, 2010). On the other hand, in the National Research by Sampling of Domicile [*PNAD-Pesquisa Nacional por Amostra de Domicílios*], of 2006, 229, 568 pickers were identified in the country (CRIVELLARI, DIAS E PENA, 2008). The MNCR, in turn, estimates that there are 800,000 pickers in the country. Other sources point to about one million pickers in Brazil (IPEA, 2010).

The preliminary version of the National Plan of Solid Wastes adopted the interval from 400 thousand to 600 thousand pickers, underscoring that of this total it is estimated that only 40 to 60 thousand pickers participate in a collective organization such as associations and cooperatives, which represent only 10% of the total number of pickers in the country (BRASIL, 2011). Thus it is perceived that there are no precise surveys about the number of pickers in the country. In this report the interval proposed in the National Plan of Solid Wastes will be considered.

In Brazil, according to data from the PNSB-2008, 27% of the municipalities knew about the presence of the pickers in the final solid waste disposal units and 50% of the municipalities knew about the action of pickers in their urban areas. On the other hand, the number of cooperatives or associations identified, in 684 municipalities was 1,175, with 30,390 pickers connected, and a higher concentration in the South and Southeast regions (IBGE, 2010). Medeiros and Macedo (2006) estimate that approximately two thirds of the

Brazilian pickers work in the state of São Paulo. The estimates of the *MNCR* point to the exis-tence of about 20,000 working in recycling cooperatives in the Metropolitan Region of São Paulo. Forty-five cooperatives are registered by *MNCR*, with a total of 851 workers. These cooperatives work with different types of material and have different levels of organization.

The *MNCR*, founded in 2001, has tried to foster the implementation of recycling cooperatives as an alternative to informal work, in order to ensure better conditions for income generation and social security to this segment of the population. These cooperatives, based on agreements signed with city administrations and large firms, can receive more wastes and negotiate a better sale.

Brazilian cooperatives and associations are very heterogeneous and very efficient in collecting, sorting, cleaning and storing the materials (IPEA, 2010).

According to data from 2005, approximately 35,000 pickers are members of the *MNCR* and they are at different stages of organization. These variations were grouped into four types of situations and levels of efficiency by Damásio (2006; 2010 APUD FREITAS E FONSECA, 2011), based on a sample of 84 picker work units, considering physical structure, equipment and production per capita compared in kg/month and in R$/month. They are:

[**TYPE I**] **HIGH EFFICIENCY**: groups that are formally organized as associations or cooperatives with their own structure and equipment – presses, scales, wagons,e tc. – with a capacity to expand to absorb new pickers and create the conditons to implement industrial recycling units. They have a lot of knowledge that can be disseminated;

[**TYPE II**] **MEDIUM EFFICIENCY**: formally organized groups with some equipment, but needing financial support to improve the infrastructure, to buy other equipment and/or sheds. They have acquired some knowledge and would be the immediate beneficiaries of the diffusion of productivity of the high efficiency groups;

[**TYPE III**] **LOW EFFICIENCY**: groups that are being organized, with little equipment, needing financial support to acquire their own shed and almost all the necessary equipment, They have little capital and require strong support for training and further learning, since they do not even know the means and sources to request funding and technical support. Organizing and establishing a cooperative would enable including new jobs for pickers and improving income;

[**TYPE IV**] **VERY LOW EFFICIENCY**: disorganized groups, on the

streets or at garbage dumps, without any equipment, generally working under very precarious conditions, for intermediaries, needing support to form an association or cooperative and financial resources to set up the entire infrastructure needed. Formally establishing an association or cooperative would allow generating new jobs and, especially, access to public policies to support the work of pickers, since these policies are directed mainly at organized pickers.

About 60% of the 83 collective pickers' organizations researched by Damasio, 2010, are at the lowest levels of efficiency[1]. **TABLE 2** shows the distribution of the number of members and MNCR groups, according to the four situations of organization mentioned previously.

Situation	Members	%	Groups	%
[Type I] HIGH EFFICIENCY	1.381	4%	24	7%
[Type II] MEDIUM EFFICIENCY	2.753	8%	70	21%
[Type III] LOW EFFICIENCY	5.720	16%	122	37%
[Type IV] VERY LOW EFFICIENCY	25.783	72%	115	35%
Total	35.637	100%	331	100%

TABLE 2 Number of pickers, groups and respective situations of the pickers associated with the MNCR in 2005. Source: MNCR (2005) apud DAMÁSIO (2006, 2010).

It is interesting to observe that 72% of the pickers associated with MNCR in 2005 were in Type IV, ie, only disorganized pickers who worked on the streets or at the dumps, whereas only 12% were formally organized and had an infrastructure to do the work. Also known as independent pickers, characterized by obtaining very low remuneration in the sale of material that they manage to collect individually (BARKI; MAGNI, 2011).

There is great heterogeneity among the cooperatives and pickers' associations in terms of productivity. The values may vary from 606 kg/picker/month (28 kg/picker/day), to 1,608 kg/picker/month (73 kg/picker/day) (IPEA, 2010). Based on research data from the Group of Intersectorial Relations [*Grupo de Estudos de Relações Intersetoriais - GERI/UFBA – PANGEA*], with 83 pickers' organizations in Brazil (DAMÁSIO, 2010 APUD IPEA, 2012), an IPEA study points out the weighted average of 1,220.9 kg/month/picker (IPEA, 2012).

[1] The respective classes of efficiency (high, medium, low and very low) have the following percentage participations 14%, 27%, 35% and 24% of the collective organizations and 16%, 24%, 43% and 17% of the pickers. Data adapted from PANGEA (Damásio, 2010a), in an intentional sample with 83 organizations and 3,846 pickers.

The mean income of the pickers, approximately, based on partial studies, does not reach the minimum wage, it is between R$ 420.00 and R$ 520.00 (UFRGS, 2010; SILVA, 2007; PORTO ET AL. 2004; IPEA, 2012). The most usual level of schoo-ling among the pickers ranges from 5th to 8th grade (UFRGS, 2010; DAMASIO, 2009).

Recognition of the obstacles to increases in production and productivity, and the suggestion for improvement may be guided by the diagnoses of working and functioning conditions of the pickers' associations or cooperatives (LIMA, OLIVEIRA, 2008). These authors also add that to improve working conditions at the cooperatives, it is necessary to integrate actions to implement selective collection, creation and organization of the cooperatives, mobilize the population and organize the production and self-management routine of the cooperative enterprise.

Social inclusion of the pickers in the recycling chain has been the subject of a series of inducing methods, in the form of laws, decrees and normative instructions to foster the picking activity. Summary **TABLE 1** below provides a few systematized examples (IPEA 2012).

As examples of federal actions aimed at recyclable material pickers, IPEA (2012) cites:

» Giving more than 280 million reais to actions aiming at the recyclable materials pickers between 2003 and 2010.

» Establishing the Interministerial Committee of Inclusion of Recyclable Materials Pickers [*CIISC Catadores de Materiais Recicláveis*] in 2003 and forming its executive office in 2007.

» Proposing a policy of Payment for Urban Environmental Services [*PSAU-Pagamento por Serviços Ambientais Urbanos*] intending to remunerate the pickers for environmental services resulting from their activity.

» Institution of the Pro-Picker Program [*Programa Pró-Catador*] for the purpose of integrating and articulating the actions of the Federal Government intended to support and develop the productive organization of pickers.

Law / Decree	Object
DECREE 5,940 2006	Institutes the separation of recyclable wastes discarded by agencies and entities of the direct and indirect federal public administration, at the source of generation, and sends them to the recyclable material pickers' associations and cooperatives. It also includes other measures.
LAW 11,445 January 2007	Waives bidding when contracting for collection, processing and commercialization of recyclable or reusable urban solid wastes in areas with a system of selective garbage collection, performed by associations or cooperatives consisting exclusively of private persons with a low income, acknowledged by the authorities as pickers of recyclable materials, using equipment compatible with the technical, environmental and public health standards.
LAW Nº 12,375 December 2010 **Art 5 and Art 6**	» Until December 31, 2014, industrial establishments will have the right to a presumed credit of the Tax on Industrialized Products- IPI, to acquire solid wastes used as raw materials or intermediate products to manufacture their products. » This can only be received if the solids wastes are purchased directly from a recyclable material pickers' cooperative, with a minimum number of members, private people, defined in an act of the Executive power, and in this case corporate bodies are forbidden to participate;
LAW 12,305 August 2, 2010	Institutes the National Policy of Solid Wastes; changes law nr. 9,605, of February 12, 1998. and other measures
DECREE Nº 7,404 December 23, 2010	Regulates Law nº 12,305, of August 2, 2010, which institutes the National Policy of Solid Wastes » Creates the Interministerial Committee of the National Policy of Solid Wastes and the Steering Comittee for the Implementation of the Reverse Logistics System, and other measures. » Art. 41 supports the model of selective collection in partnerships, cooperatives and city administrations.
DECREE Nº 7,405 December 23, 2010	Institutes the **Pro-Picker Program** [*Programa Pró-Catador*], called Interministerial Committee for Social and Economic Inclusion of the Pickers of Reusable and Recyclable Materials, the Interministerial Committe for the Social Inclusion of Recyclable Pickers, created by the Decree of September of 2003, determines organization and functioning and other measures.

TABLE 1 Systematization of the laws concerning recyclable material pickers.
Source: IPEA 2012.

Decree nº 7474/2010, aims at municipal partnerships with pickers' cooperatives, whose organizational model appeared in the 1990s, and it is processed essentially by the City administrations who provide a sorting shed, collection equipment and vehicles to the cooperatives (BESEN; RIBEIRO, 2007; BARKI; MAGNI, 2011). The reality of these partnerships among civil organizations and the public authorities brings society to the issue of integrated management of USW and its relationship with a stronger citizenship and the public legal space. It should, however, be highlighted that, although surrounded by apparatuses

and official incentives, the formal agreements with the local city administrations do not ensure appropriate working conditions to those who work in USW recycling cooperatives, an essential requirement for their social inclusion.

The economic aspects of solid waste management are nothing new. The recycling industry has been a constituent part of the periods of economic change, in manufacturing products from recycled or partly used materials, and in some places it is still intrinsic to the domestic economy. What is new is the size, the reach and complexity of the economic circuit involved in the solid wastes (PORTER, 2002; PRYOR, 2005). Theoretically this should not surprise us. It is no less than an attempt by the market to recover the value of remnants of production and consumption, avoiding loss of value.

Although recycling is an economically lucrative business, the commercialization cycle kept it on the edges of legality, where the pickers' work is the initial link in an economic chain (LEAL ET AL., 2002; GONÇALVES-DIAS, 2009B). The existence of people who work with solid wastes is almost common place in the landscape of Brazilian cities. There are reports of their existence since the end of the 1930s. In those days, pickers as a group were socially almost invisible, sometimes stigmatized because they lived on the streets, sometimes due to their activities, collecting remnants of garbage (SANTOS; GONÇALVES-DIAS, 2012).

Picking has become a form of work, initially in the large cities, limited to looking for paper, glass and scrap metal sold to middlemen who resold to the picker companies (*Catadoras*). The pickers became visible as a work force in the mid 1980s, when a large number of people began to survive by collecting recyclables, and also when the recycling market began to be consolidated in the country (BOSI, 2002).

The the recycling industry in Brazil has been consolidated over the last 25 years, and ever since it began, the pickers essentially provided it base. The technological resources to transform recyclable wastes into raw materials already existed previously, however it was the cheap workforce of the pickers that made these technologies feasible, in terms of costs of collecting and separating the recyclable materials (BOSI, 2002; LEAL ET AL., 2002).

During the 1990s, several experiences of pickers' cooperatives and associations were developed in Brazil. A few partnerships were also established with the public authorities in municipal selective collection programs. It should be pointed out that this process was neither simple nor linear, but rather marked by social conflicts and specific dynamics in which, in many municipalities, the relationship between the public authorities and the pickers

continues to be of repression or omission, as for instance in the city of São Paulo. (GONÇALVES-DIAS, 2009B).

In this way the public look at the pickers' presence is variable. Often it mobilizes humanitarian sentiments, at other times feelings of repulsion and indignation. There is an environmental prejudice regarding the pickers which oversimplifies the complexity of the conflicts of their location in the central spaces of the large cities and ignores the dialectical connection between the spatial construction and the social forces, and, above all, does not know the dignity of the work done by the picker (SANTOS, 2000; 2003). However, the pickers have been responding, since they lack opportunities and conditions to become part of the professional activities of the formal market. As an economic activity, with a strong environmental bias, recycling has become a concrete alternative to promote social inclusion, creating opportunities for the generation of work and income for socially vulnerable segments of the population, particularly the pickers of recyclable material who, in a large number, work informally as autonomous, dispersed agents, or in an organized manner through associations and cooperatives.

From this perspective, the social and productive inclusion of the pickers is perverse. On the one hand it depends on economic advantages regarding cost of collection, being performed using intensive non-specialized labor, at the lowest pay. On the other hand, it is threatened by gains in scale, that would render new collection technologies lucrative, while sending away labor. Now, what is left to the pickers in organization, as a means of struggling for a more consistent and permanent social inclusion (GONÇALVES-DIAS, 2009B; BURSTYN, 2000). Finding out these issues from the inside, and the socioenvironmental aspects related to this working class recall the tireless effort of research and investigation.

There are no surveys with precise data on the number of pickers. A few forecasts indicate more than one million workers spread throughout several Brazilian cities. The pickers have a fundamental position in the field of recycling, as their existence comes to reflect the difficulty of intermediaries in integrating picking into their activities. This is due to problems of scale of production, combined with logistic difficulties (GONÇALVES-DIAS, 2009B). According to the *PNRS*, the State and Municipal Solid Waste Plans should foresee goals for the elimination of garbage dumpes, associated with social inclusion and the economic emancipation of the pickers.

Since this policy is about to be institutionalized, and because of its direct relations and connections with the picker's role, it is necessary to develop specific studies and analyses of this interdisciplinary field of knowledge to

provide further information for the implementation and regulation of the aforementio-ned legal instrument. Article 44 of this law deals with fiscal, financial and credit incentives to industries and entities that have projects in partnership with the pickers cooperatives.

The current discussion attempts to elucidate and clarify the commitment of the public authorities to complying with the principle of inclusion of pickers according to Law 12,305, spelling out the need to ensure the rights of pickers who are not yet organized, promoting the strengthening of pickers' cooperatives and associations, ensuring effective access to rights and increasing their efficiency, ensuring that the management of urban solid wastes will also include the participation of the pickers as protagonists, incorporating them also as economic actors from the perspective of becoming citizens, from the perspective of dignity and construction of citizenship; ensuring the rights of pickers, since they are workers in a situation of social vulnerability who are deprived of their rights. Another aspect to be observed concerns the role of pickers within the management of solid wastes and its influence on the population's pro-environmental behavior. The circulation of pickers in the urban milieu is an activity that communicates the solid wastes in the urban sphere, elucidating the social and environmental impacts of post-consumption of the industrial product.

From the point of view of public policies, a major agenda is to rethink the model of inclusion of the pickers in waste management of the large Brazilian metropolises. What model would ensure greater autonomy of the pickers organized as cooperatives? Therefore it is necessary to develop, shape, syste-matize, analyze the existing experiences, develop a model that can be tested, reproduced and expanded.

It is necessary to overcome a few difficulties to consolidate a recycling model without reproducing the perverse effect of exclusion and exploitation of the pickers, and they require the contribution of multiactors and multidisciplinary knowledge in cooperation networks. In this context, the study of the profile of competencies of the entrepreneurial pickers may expand the theoretical debate about solidarity entrepreneurialism, and in this sense, advance in the analysis of the factors that should be developed in solidarity business incubation processes. Ultimately, helping elaborate public policies that lead these people to resignify work, finding in themselves qualities and strengths they did not know they had and giving a new meaning and perspective to their lives.

From this perspective, a successful model depends on the cooperatives' capacity to conjugate technical efficiency with social efficacy (LIMA; OLIVEIRA, 2008). This approach incites the need to perform a broad interdisciplinary

debate about the model on which, today, is founded the entire process of solid waste recycling in Brazil. It is based mostly on exploiting a a mass of miserable workers who are obliged, by different coercitive, economic and social instruments, to seek ways to ensure their survival by working in and with wastes. This aspect, camouflaged by ideas of environmental preservation and conservation, is never presented as the main factor of the ever increasing number of tons of wastes recycled in Brazil (GONÇALVES-DIAS, 2009B).

FINAL CONSIDERATIONS

Although the issue of solid wastes is a great challenge for sustainability, the phenomenon and its impacts involving prevention, generation, collection, disposal have been treated by sector, ie, without articulation, which leads to fragmented public policies (SANTOS; GONÇALVES-DIAS, 2012). Many dimensions are related to this matter, including social, political, economic, environmental and legal aspects. There is thus a clear need for a systemic view to understand the problems, planning and solid waste management, towards public policies that emphasize the intersectorial coordination.

In the past, the economic cost of the solid waste services was the main factor of control in the decision-making processes; however, recently, social and environmental considerations have played a more significant role. There is an imperative need to integrate all solid waste management activities based on prevention and options of treatment according to the characteristics of each waste.

Currently, Brazil is undergoing a phase of marked development with growing expansion of economic activities, urbanizaiton and population growth which also result in changes in population life style production and consumption. As a direct consequence of these processes, there has been an increase, both in quantity and in diversity, in the production of wastes, especially in the large urban centers. Furthermore, due to the new technologies that have been incorporated into everyday life, the solid wastes produced today are composed by a variety of synthetic elements that are difficult to treat and hazardous to the health of humans and of ecosystems.

Despite the advances in recent years, Brazil still faces a major challenge in solid waste management: the social and productive inclusion of the pickers. According to the National Policy of Solid Wastes [*PNRS*], the municipalities must close and recover open air dumps and improve their selective collection,

through measures to emancipate the pickers socioeconomically. Although recycling is an economically lucrative business, the commercialization process has kept it at the edge of legality, with big gaps in the rights of these workers, and through the informal purchase of merchandise by intermediaries and factories.

It is essential to do further research on the insertion of pickers into the dynamics of urban solid waste management governance. Public policies connected to solid waste management have undergone major transformations in the contemporary Brazilian reality, ranging from the approval and implementation of a new regulation about waste disposal, aiming at eliminating the so-called "dumps", until reaching the actions of environmental movements and non-governmental organizations in such as way as to incide on the dynamics of sustainability.

Dealing with this issue in a multidisciplinary approach gives the country an opportunity to confront its problems regarding solid wastes in an innovative form seeking state-of-the-art knowledge. Brazil still lacks researchers and studies, with a more integrated understanding about this issue and that can contribute to a more efficient management, whether it be in the public sector, in civil society, or even in the private sector. The intention of this article was to look at these challenges, given the complexity of social and productive insertion of the pickers in the multiple dimensions of the activity and the recycling market.

It is understood that to attain these objectives, it is necessary to adopt research procedures based on participatory methodologies founded on action-research. The search for interlocution among academics, pickers, activists involved in the rights of these workers, managers and specialists from public agencies and private enterprise, articulated with the local demands regarding waste management, only becomes effective based on approaches that can truly understand the practice and experience of the pickers in the activity of recycling and the conquest of their rights.

There should be further investigations to deal with this instigating, urgent and extremely relevant agenda of research in the Brazilian context, whether it be in the characterization and analysis of policies, programs and projects that incide on the pickers' reality; on the discussion of possibilities and risks of productive inclusion of pickers through policies, programs and projects developed by government agencies, national and international NGOs, organizations that advocate pickers' rights and companies that develop actions of social and environmental responsibility related to recycling.

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URBAN CLEANING AND THE NATIONAL POLICY OF SOLID SOLID WASTES: IMPACTS ON THE PRESENT AND A LOOK TOWARDS THE FUTURE

HELIANA KÁTIA TAVARES CAMPOS
SONIA SEGER MERCEDES

BACKGROUND
MANAGEMENT OF URBAN CLEANING SERVICES AND THEIR TIES TO WASTE GENERATION AND PREVENTION OF POLLUTION

Discussion of the prevention of waste generation in urban cleaning services, and waste management means to acknowledge that waste collection, transport and disposal activities have a negative impact on each of these segments, on "the value of natural and economic resources. whose competing uses present a much higher cost of opportunity. In brief, materials, energy, soil and labor, as well as environmental aspects are underused and degraded, especially as to issues involving climate change.

No matter how different the particular forms of solid waste management in operational terms worldwide, the activities are basically the same and, therefore, the reasons to optimize them also are similar. Actually, the greater the economic restrictions to which communities are submitted, the more important these motivations, since the impacts become proportionally larger and so does the cost of managing the solid wastes. Some of the issues involved in urban solid waste management currently, for which answers will soon be found, include:

» Increasingly strict environmental regulations worldwide
» Budget restrictions and comparative importance of needs competing for the same resources

» Reduction of the availability of areas for transfer, treatment and disposal of solid wastes
» Increasing popular interest in sanitary and environmental issues
» Increased cost of inputs and ancillary services needed to manage solid wastes
» Tendency for demand to increase as population grows
» Improved public health conditions

According to the report *What a waste*, published by the World Bank (HOORNWEG AND BHADA-TATA, 2012), in low income countries the costs of collection are about 90% of the (general) budget of public services management, and only a small part of the resources is used to find solutions for disposal. In countries with a medium income, a group which includes Brazil, the percentage of the budget for collection is 60% to 80%. Besides, mechanized collection is greater than in the low income group. In countries with a higher income, expenditures on collection reach up to 10% of the budget available for solid waste management. Significantly higher parcels are used for intermediate treatment facilities, whose implementation, however, is made easier by greater community participation in programs for reduction and separation at the source, increasing the spread of options to configure the management systems. **FIGURE 1** shows data aggregated by level of income, of costs for some urban cleaning activities.

	Low Income	Lower Mid Inc	Upper Mid Inc	High Income
Income (GNI/capita)	<$876	$876 - 3,465	$3,466-10,725	>$10,725
Waste Generation (tonnes/capita/yr)	0.22	0.29	0.42	0.78
Collection Efficiency (% collected)	43%	68%	85%	98%
Cost of Collection and Disposal (US¢/tonne)				
Collection[2]	20-50	30-75	40-90	85-250
Sanitary Landfill	10-30	15-40	25-65	40-100
Opend Dumping	2-8	3-10	NA	NA
Composting[3]	5-30	10-40	20-75	35-90
Waste-to-Energy Incineration[4]	NA	40-100	60-150	70-200
Anaerobic Digestion[5]	NA	20-80	50-100	65-150

Note: This is a compilation table from several World Bank documents, with the World's Bank Thematic Group on Solid Waste, Carl Bartone and other industry and organizational colleagues. Costs associated with uncollecte waste-more than half of all waste generated in low-income countries are not included.

FIG. 1 Estimated Solid Waste Management Costs by Disposal Method by per capita income category. Source: Hoornweg and Bhada-Tata, 2012.

The same publication shows an expenditure of US$ 24.5 billions in countries with a middle to high per capita income, a segment which includes Brazil. (HOORNWEG AND BHADA-TATA, 2012). Considering the same costs (**FIGURE 1**), data generated, disposal methods and premises used by the abovementioned source, and performing a simulation for the countries with the medium to high per capita income segment, and three scenarios (as simple as possible) of avoided generation of solid wastes, it is found that there can be significant cost reduction (**TABLE 1**).

	Solid waste generation (2010)	**Expenditures on collection** (US$ 65/t)	**Expenditures on sanitary landfill** (90%) (US$ 50/t)	Expenditures on incineration for energy (10%) (US$ 100/t)	Total Reduction US$	%
BC*	243.000.000	13.267.800.000	9.185.400.000	2.430.000.000	24.883.200.000	
(1)	202.176.000	11.038.809.600	9.097.920.000	2.021.760.000	22.158.489.600	10,95
(2)	186.138.000	10.163.134.800	7.036.016.400	1.861.380.000	19.060.531.200	23,40
(3)	170.100.000	9.287.460.000	6.429.780.000	1.701.000.000	17.418.240.000	30,00

*BC = Base Case
(1) Scenario 1 - 25% reduction of organic matter and 10% reduction of recyclables
(2) Scenario 2 - 25% reduction of organic matter and 30% reduction of recyclables
(3) Scenario 3 - 25% reduction of organic matter and 50% reduction of recyclables
(4) Collection = 84%; cost = US$ 65/t; gravimetric composition = 54% OM + 33% RR + 13% others

TABLE 1 Impact of solid wastes on the cost of urban cleaning services.

This is an exploratory exercise, since it uses medium aggregate data and considers the currently unfeasible possibility that solid waste generation can simply be avoided, ie., that a considerable amount of solid wastes will not be generated, which in itself would generate costs and require time. This simulation is only useful to demonstrate the possibilities of saving money as a result of reducing wastage beginning in the household. An in-depth analysis should specify the capital and operational costs (fixed and variable) which would be avoided with this reduction and, if possible, the potential gains as a result of using, alternatively, the physical and financial resources that would no longer be utilized for public cleaning services and management of solid wastes, using figures that have economic merit.

Systematic provision of urban cleaning services by public authorities began at the end of the 18th century and, beginning of the 19th in Europe (HERBERT, 2007), and at the beginning of the 20th century in the USA (SPIEGELMAN AND SHEEHAN, 2005), initially characterized by organizing some activities such removal of wastes and disposing of them outside the boundaries of the urbanized region and by regulating some individual

measures, such as cleaning in front of houses, and using containers to accommodate the solid wastes (KANOUNI, 2009). This scope was progressively diversified, as the complexity of urban life and the population of cities increased, and it began to include activities that are now commonly attributed to this segment of infrastructure services: sweeping, removal of conventional large wastes or wastes with special characteristics, solid waste treatment, construction and operation of sanitary landfills and others.

They were implemented in Brazil, initially, also in the 19th century, in Rio de Janeiro because of the Portuguese Imperial Court in Brazil (EIGENHEER, 2009) and later in other cities, imitating European ways and customs (REZENDE AND HELLER, 2002). The municipality holds the title to urban cleaning services, and given the strongly local characteristics, according to article 30 of the Federal Constitution, these services are within their purview. The municipality can legislate supplementarily to the federal and state legislations (BRASIL, 1988). From the legal, institutional and regulatory standpoint, it was only during the military period, with the implementation of National Council of Sanitation (*Consane – Conselho Nacional de Saneamento*), that urban cleaning officially became part of the scope of public policies. However, this council never did actually function, and the national sanitation policies continuued to prioritize drinking water supply and sewage collection, which were historically "privileged" (MERCEDES, 2002).

Throughout the sectorial institutionalization process, financing of basic sanitation services and, above all, of urban cleaning and waste management were always a sensitive point. However, follow-up and management of the services by creating and performing regular maintenance of information systems, were slow and delayed. Currently there are relatively systematized sources of information, on an annual basis, whose series are not, however, longer than fifteen years (the periodicity of prior surveys was ten-yearly and it was not always followed). Even so, they are important to evaluate the performance of basic sanitation services, according to some criteria. In the sphere of the topic discussed in this chapter – prevention of solid waste production – a few parameters can be highlighted that allow discussing the impact of public policy instruments for the prevention of waste generation on the management of public urban cleaning services and present a few prospective considerations.

Here the character of providing service from the regulatory and economic standpoint should be acknowledged. In the beginning it was

treeated as an essential service, necessarily rendered in a public form, because of the successive restructurings undergone by the national economy and the infrastructure sectors thesmselves. Progressively it took on a status of public utility (industrial), not necessarily rendered by the State but, when rendered by it, under a logic of the "entrepreneurial State". This character remains, and was expan-ded, even though the liberalization that occurred mandatorily in other sectors did not reach the basic sanitation sector, despite the recent launch of a loosely reformist policy for the sanitation sector (BRAZIL, 2007) – just as for the others – turned to the implementation of works, with the rise of the party that was still running the central government. From this perspective the central objectives of provision of services change. They migrate from universalizing access, assiduousness and continuous improvement of quality to obedience to economic efficiency criteria, if not exclusively, as a majority.

During the first phases of the institution of basic sanitation service – water and sewage, especially - the administration was predominantly direct. It later was characterized by the autarchic form, until it incorporated econo-mic-financial goals to be achieved, especially by self-financing. At this stage, the form of management, as mentioned, was established as State policy (*Planasa* – National Sanitation Plan, 1960s). There are basically two forms of urban clea-ning services management: directly by the municipality (organs of director indirect administration), or through para-State entities (public or mixed economy enterprises or municipal and intermunicipal autarchies). The private sector can be involved by delegation (concession, permission) or contract (outsourcing).

The main parameters for the configuration and sizing of urban cleaning services and solid waste management are the amount of wastes which must be handled and solved, and their physical, physicochemical and microbiological characteristics. This solution comprises the packing, collection, treatments and final disposal. The administrative structure of the services can, thus, also be indirectly determined by the amount of wastes. From the stand-point of physical and financial performance of the services, ie., of the costs involved and the efficacy of their rendering, a few elements can be specified, at each stage of waste management, whose sizing is directly influenced by the quantity (**TABLE 2**). This approach does not include the recovery of recyclables from the voluntary delivery or door to door collection. These processes have their own set of costs, also connected to the quantity and quality of wastes received by the management system.

Activity	Element	Costs involved and minimum determining factors
Packing	Street collectors	Amount, material, installation and maintenance of equipment.
Collection	Teams	Number an size of teams – salaries and social charges, EPIs.
	Vehicles	Size of fleet, type(s) of vehicles – fuel consumption, maintenance, spare parts, garage area, licensing, possible penalties (fines), depreciation, fleet renewal.
	Transport	Collection periodicity and routes – influence the previous elements: time of implemetnation, under or overuse of vehicles and teams.
Treatment(s)	Composting	Area for the composting process and to store compost; amount, capacity and type of equipment for reception, reducing the particle size, turning the piles (tractors), sieving, packaging and others; laboratory analyses; implementation and campaigns and instruments for the dissemination and education,with a view to separation at the source; teams to carry out and control process quality and to coneive and execute dissemination and education programs; distribution of the compost (transaction costs); possible penalties (related to the quality of the compost); administrative costs (services, taxes and others).
	Biodigestion	Area for biodigestion and to treat effluents and rejects from the process; quantity, capacity and type of equipment for reception, reduction of particle size, biodigestors for treatment, transport and storage of biogas, and for a possible production of electricity, or thermal energy, or both (turbines, motors, heat exchangers, others); process inputs (water inoculums, energy); costs of connecting to the energy or gas network (possible); laboratory tests; implementation and performing campaigns and instruments for dissemination and education, with a view to separation at the source; teams to implement and to control the process quality and to conceive and execute dissemination and education; licensing and grants. sometimes penalties (environmental or referring to energy supply); backup rates for electricity (sometime); administrative costs (services taxes) and others).
	Incineration	Area for the process and its rejects; technology, capacity and quantity of equipment; licnsings; inputs and reagents for pollutant abatement; teams for the execution and control of process quality; possible penalties, administrative costs. possible need to increase the calorific power (acquisition of combustible material).
Final disposal	Sanitary landfilling	Area(s) and work life of the sanitary landfill; engineering projects; materials, vehicles and buildings for security, administration and operation of the landfill, treatment of effluents and emissions, fuel, teams for reception and weighing, operation and maintenance of the landfil, licensing and grants, administrative costs, possible employment of specialized consultancies.

TABLE 2 Urban cleaning activities and impacts of the amount of wastes to be managed

Besides the quantity of waste expressed in terms of mass, another characteristic that has an impact on the management system is volume. If on the one hand the costs of providing services are expressed in relation to the mass, on the other, for instance, the dimension of area and equlpment, but above all the area for final disposal – its work life, depending on optimizing volume, not only the weight, of the deposited wastes. In this sense, control of the presence of packaging with a view to reduction, offers one of the most important tools for rationalization of the use of physical and financial resources in management of solid wastes, considering their high relative participation in the composition of the total amount of urban wastes.

The volume occupied by packaging in the transport equipment and in the landfills leads to their being underused, with the introduction of empty spaces, or dead spaces, or even aerobiosis spaces that make it difficult for the wastes to ferment in the landfills, reducing biogas production, and they create structural instability (differential consolidation of the soil). The reduction of this volume requires using compaction equipment. This includes specific vehicles for this purpose, that are more expensive (acquisition and maintenance), and complex than vehicles with a conventional or open body, that can only be used under very specific conditions, above all in small towns. As regards treatments, it is essential to reduce the size to increase the efficiency of the biochemical processes, whether they be fermentation (anaerobe), or mineralization (aerobe), that depend on an area of contact. In addition, the packaging material also interferes in the performance of these processes, sometimes requiring separation according to class and exclusion of the inhibitors.

Analyzing the variation of the prices of some commodities, one clearly distinguishes the impact of the increasing manufacture of products whose main destination, currently, is the landfill, as garbage, especially, in this case, packaging. The progressive rise in the price of energy (**FIGURE 2**), a primary need for production and transport systems to function, and also for waste management, besides the industrial raw materials (metals and agricultural products-food, garments, chemistry) (**FIGURE 3**, **FIGURE 4**, **FIGURE 5**) used to produce food, but also packagings, falls heavily on any justification to maintain the prevailing order. Even though scarcity has not proved a limiting factor in the period analyzed, nor in the near future, monetary speculation can exclude a large part of the world population from access to products and services, on the consumer side, and also on the solid waste management side, which is an essential component of well-being (wealth, health, etc.).

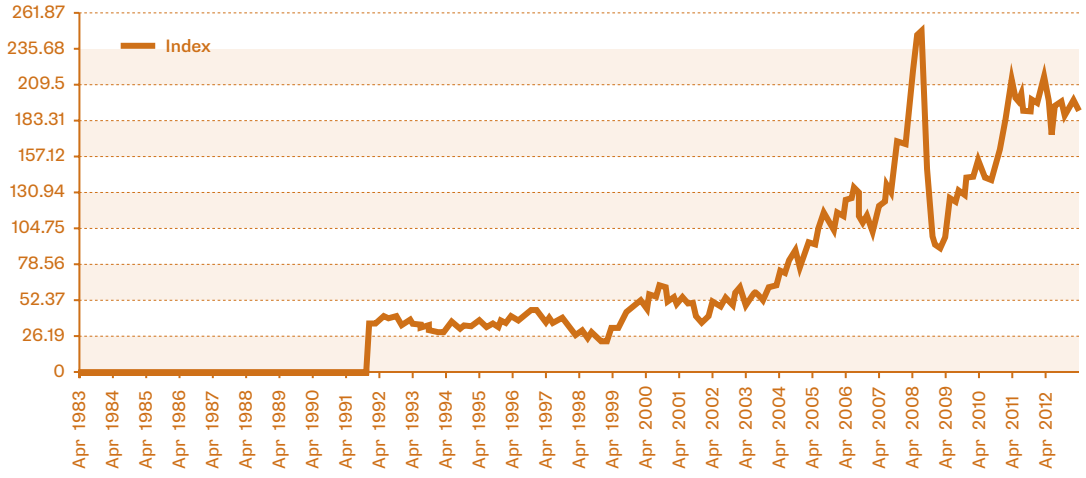

FIG. 2 Commodity Energy Price Index. Source: Fundo Monetário Internacional para Index Mundi. Obs.: include oil, natural gas and coal.

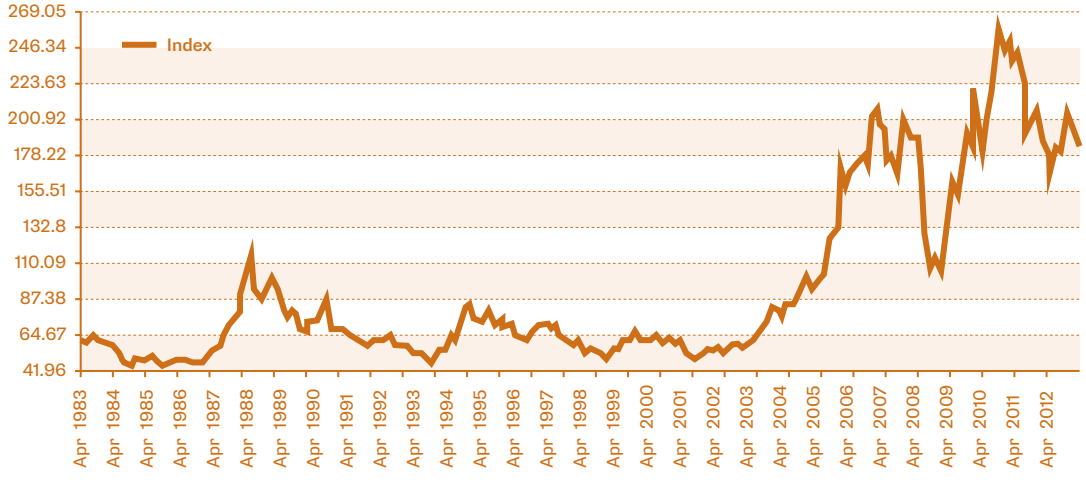

FIG. 3 Commodity Metals Price Index. Fonte: Fundo Monetário Internacional para Index Mundi. Obs.: this includes copper, aluminum, iron oxide, tin, nickel, zinc, copper and uranium

The determination of national price indexes for land – urban, rural – is a more laborious exercise and rather recent, from the number and variety of parameters involved. However, above all in urban areas, although it is complex to determine and the subject of many (and distinct) studies, the indicators available (**FIGURE 6, FIGURE 7, FIGURE 8, FIGURE 9**) allow analyzing the tendencies, which are already very valuable for this discussion. The prices according

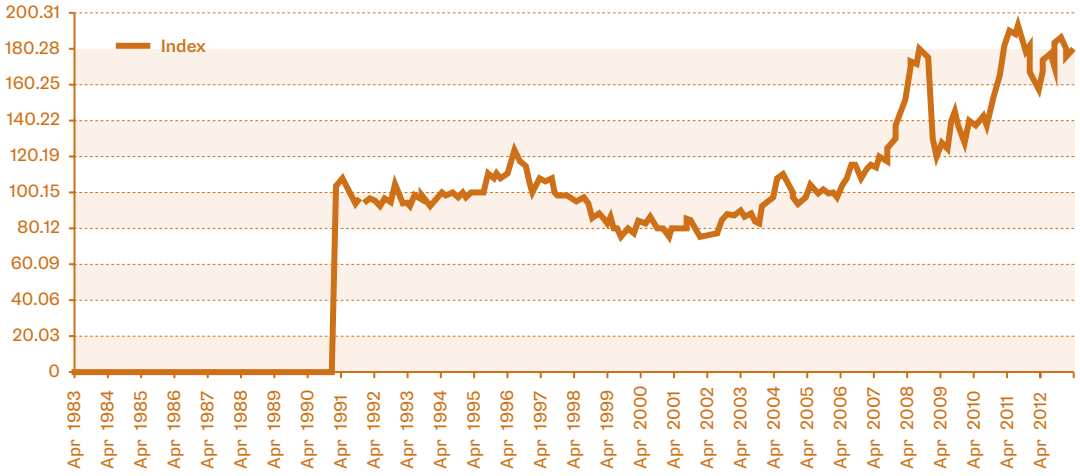

FIG. 4 Commodity Food Price Index. Fonte: Fundo Monetário Internacional para Index Mundi. Obs.: this includes cereals, vegetable oils, meat, fish, sugar, banana and orange.

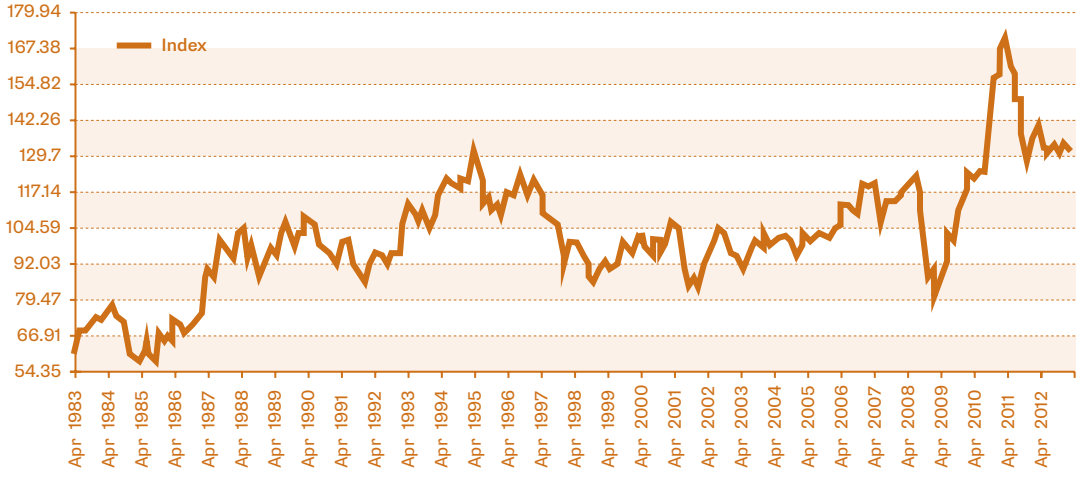

FIG. 5 Agricultural Raw Materials Price Index. Fonte: Fundo Monetário Internacional para Index Mundi. Obs.: this includes wood, cotton, wool, rubber and leather.

to these tendencies present a similar behavior compared to the resources discussed previously, ie., constant growth and occurrence of speculative bubbles, including the one that originated the recent crisis in the hegemonic production mode, beginning in the mid 2000s. Besides being a component of the formation of national wealth, “land”, in the local and regional economic system is a high value “merchandise”. In addition, it has an impact on the entire

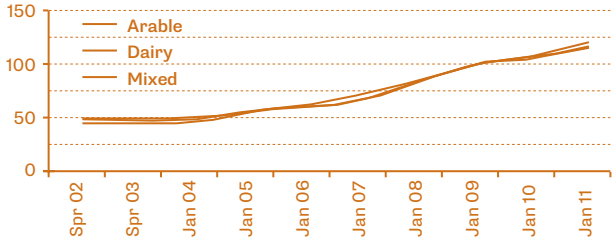

FIG. 6 Trend of values of 'virgin" (non-developed) agricultral land in England and Wales. Source: Valuation Office Agency, 2011.

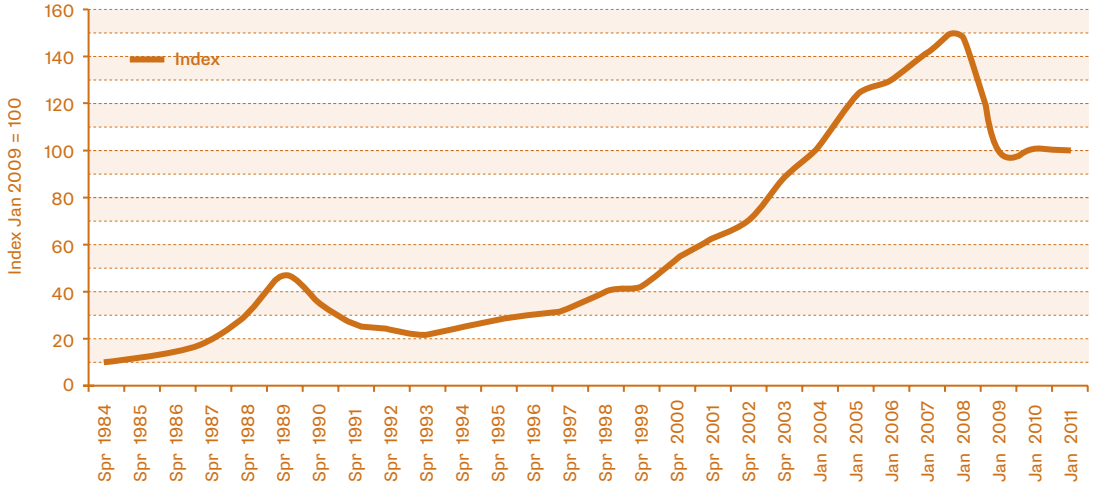

FIG. 7 Trend of values of of urban land for residential development (based on land values in pound/ha). Source: Valuation Office Agency, 2011.

chain of construction and building market in an urban (residential, commercial, industrial) and rural sphere (agriculture and livestock, agribusiness). In this context the economic restrictions to use as a waste dump have been added to the already mentioned environmental restrictions. It should also be considered that the pressure on the need for land for competing purposes will increase with future demographic growth.

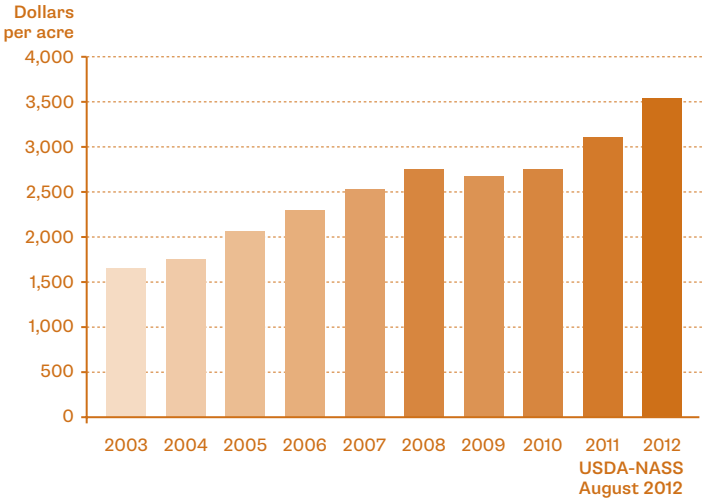

FIG. 8 Average cropland values - USAA. Fonte: National Agricultural Statistics Service, 2013.

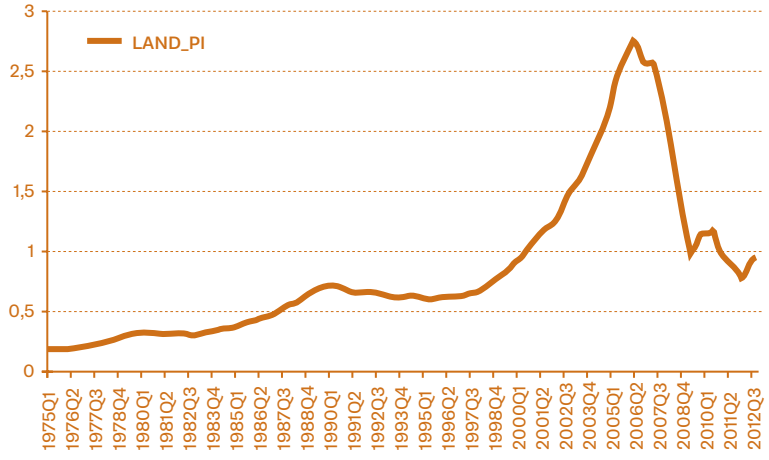

FIG. 9 Price Index for Residential Land 1975-2012 - EUA. Fonte: Lincoln Institute of Land Policy, 2013.
Obs.: this does not include the value of constructions, only the plot of land.

Since the cost of the waste management system is paid by society, every opportunity to reduce it will have a direct positive economic impact. However the indirect impacts are even more significant in environmental terms, but above all of social justice and sustainability and the formation of new values.

SITUATION OF SOLID WASTES IN BRAZIL -THE EVOLUTION OF PER CAPITA WASTE GENERATION

Brazil is characterized as a globally important country, with great advances in the reduction of poverty and social liabilities, and strategic advantages compared to most developed countries. In recent years it has adopted an economic policy and social programs for income transfer, such as the *Bolsa Família* (Family allowance for very low income families) and the *Benefício de Prestação Continuada* (Continuous Help Benefits), which help less wealthy families to cover their basic needs as consumers (BRASIL, 2007).

Social mobility, or migration of the income of Class D and E families to class C and D, has favored increased consumption A survey performed by Instituto Data Popular in the first half of 2011, presented in **TABLE 3**, shows this mobility trend.

Social class	2004	2011	2014
Class A	2.70%	3.20%	3.30%
Class B	6.30%	8%	8.70%
Class C	42.40%	53.90%	58.30%
Class D	41.30%	31.10%	26.80%
Class E	7.30%	3.80%	2.90%
Total number of Brazilians	181 millions	193 millions	197 millions

TABLE 3 Evolution of percentage of Brazilians in classes A, B, C, D and E*
Source: Data Popular. (*) IBGE: Monthly family income
Class A – above R$10,200,00,
Class B – between R$ 5,100.00 and R$ 10,200.00
Class C – between R$2,040.00 and R$ 5,100.00
Class D – between R$ 1,020.00 and R$2,040.00
Class E – up to R$ 1,020,00.
Data on the first half of 2011 and forecast for 2014.

Another aspect that has made it easier for poorer families to increase consumption is access to credit for low income youths, recorded by the *SERASA EXPERIAN* survey. This group requested 25.5% of the credit cards in Brazil during the first half of 2011. Class E surpassed the others, with 52% requesting credit cards in 2009, 54.8% in 2010 and 58.8% in 2011, reaffirming their prevalence in access to credit (VALOR ECONÔMICO, 2011).

Changes of habit can also influence an increase in per capita generation of solid wastes. the reduction of the number of inhabitants per domicile, from

3.8 in 2000 to 3.3 in 2010 (IBGE, 2010), favor increased consumption due to scale dyseconomy. The more effective entry of women into the work market, the rise in the rate of female activity between 1981 and 2002, from 32.9 to 46.6%, and the increase in the number of domiciles where the woman works from 35 to 46.9%, during the same period (HOFFMANN AND LEONE, 2004), contribute to increased consumption.

The reflux of Northeast/Southeast immigration stimulates changes of consumption habits in the local populations, as a reflex of the behavior of migrants who retturn to their origins, creating new aspirations of consumption patterns in their lifestyles (SAWYER, 2002).

As to the activities that can contribute to the reduction of wastes to be collected, the number of domiciles with refrigerators in Brazil is recorded, with a 71.5% increase in 1992, to 93.9% in 2009 (IBGE, 2009), helping reduce the wastage of organic garbage.

The organized or individual action of the recyclable materials pickers, the reception of bulky wastes and garden prunings at the Voluntary Delivery PoInts (*PEV – Pontos de Entrega Voluntária*) influence the reduction of wastes positioned for conventional collection. The reuse of civil construction rubble in public works, of compost in parks and gardens, and the effects of environmental education are possible factors in the reduction of waste generation.

The factors that contribute to increasing waste generation, however, are broader that those that contribute to reducing it. The National System of Information on Sanitation (SNIS) has recorded the increased per capita generation of wastes year by year. There was a variation of 0.93 kg/inhb./day in 2010 to 0.96 kg/inhab/day in 2011.

-OVERVIEW OF URBAN SOLID WASTE MANAGEMENT IN BRAZIL

The evolution of solid waste management in Brazil points to a historically fragile sector with various advances and steps backwards in urban cleaning and in waste management, in their provision, charging, regulation and inspection. One might say, however, that great progress has been made in recent years and that almost all municipalities have door to door collection services regularly, in their urban areas. This is, so to say, the primary activity to generate health; removing the wastes from the immediate surroundings of homes.

The coverage of the waste collection services in 2011 corresponded to 98.4% of the urban population, with the South Region having the highest coverage index, 99.4%, and the North the lowest, with 94.8% (BRASIL, 2011). In the rural area, however, these indicators are not good news, corresponding to less than 30% of the coverage, and the wastes collected are burned, buried or thrown on to empty lots or streets (IBGE - PNAD, 2009). Likewise, the populations living in very low income areas (shantytowns) which are difficult to access in large cities, also do not have door to door collection, or any regular provision of services.

The mass of solid wastes collected daily in Brazil went from 140,081 t/d in 2002, to 188,815 t/d, in 2008. Out of this total, the amount disposed of in sanitary landfills during the period increased from 35.% to 58.3%; in a controlled landfill it decreased from 24.2% to 19.4% and in dumps or open air sinks it fell from 44.49% to 19.8%, showing a substantial improvement. As to composting, it was greatly diminished, falling from 4.5% to 0.8% during the period. This reduction causes significant environmental damage, increasing the generation of leachate, and it does not prevent materials that could be treated and applied to soil to improve physical conditions and the capacity to retain humidity from reaching the landfills. The amount of wastes to be sent to sorting units for recycling also fell slightly in percentage terms, from 1.5% to 1.4% during the same period, recording a small increase in the amount of wastes for these units, in absolute value from 2,158 t/d to 2,592 t/day (IBGE - PNSB/2002-2008).

Several studies were performed about selective collection in Brazilian municipalities in the last few years, with very different results. The coverage of services and the types of collection performed, if door to door or at voluntary delivery points, is not precise, and the situation of independent pickers and scrap collectors working in the sector is also unknown.

A study performed by the SNIS, of the Ministry of Cities, recorded that in 2011 selective collection was done in 40.1% of the 2,100 municipalities surveyed, corresponding to 865 municipalities. No extrapolation was done to the national level. The South region presented the best results while the Center-West had the worst. On the other hand, the survey of the Entrepreneurial Commitment to Recycling (COMPROMISSO EMPRESARIAL PARA A RECICLAGEM - CEMPRE CICLOSOFT 2012) indicates 766 cities performing this activity at the national level. This figure is less than indicated in the Abrelpe survey, which shows the existence of selective collection in 3,025 Brazilian municipalities in 2011. The *Atlas de Saneamento* (Sanitation Atlas) of IBGE recorded 1,001 municipalities with selective collection, corresponding to 17.9% of the total. It is impossible to be certain about the number of Brazilian municipalities

that declared having implemented selective collection of wastes, showing very fragile data, as presented in **TABLE 4.**

Institution responsible for the survey	Type of Survey	Municipalities with selective collection	% Municipalities with selective collection	Year
SNIS – Ministry of Cities	Sample	865	16	2011
CEMPRE CICLOSOFT	Sample	766	14	2012
ABRELPE	Sample	3025	54	2011
ATLAS SANEAMENTO IBGE	Census	1.001	18	2011

TABLE 4 Municípalities with selective collection in Brazil
Source: BRASIL, 2011; CEMPRE, 2012A; ABRELPE, 2012; IBGE, 2011.

According to the SNIS, in the municipalities with selective waste collection in 2011, in 25.4% of them collection was done directly by the city administration, in 32% by the pickers supported by the city administrations and in 42.6% by private companies employed by the municipal authorities.

As regards the waste recovery facilities (*IRRs -Instalações para a Recuperação de Resíduos*), by region, the National Survey of Basic Sanitation (*Pesquisa Nacional de Saneamento Básico*) (IBGE – PNSB/2002-2008) recorded an 235% increase during the period. It was expanded from 189 units, in 2000, to 445 units, in 2008. The region with the greatest increase in the period was the North with 700%. In the Northeast Region the increase was 131%, in the Southeast 347%, in the South 170% and in the Center West 138%. However, studies performed by SNIS in a universe of 2100 municipalities, in 2011, showed 304 facilities, and more than half of them, ie. 159, were in the South region of the country. In general, these facilities are not planned, and are often adapted for the purpose, and are not in accordance with the required technical standards and salubriousness (FUÃO, 2010). The waste recovery processes are mostly inefficient, with low productivity and the working conditions are very precarious (CAMPOS, 2013). However, the results achieved in recovering some materials are significant, as shown in **TABLE 5.**

Classification	Material	Percentage	Quantity (mil t)
1	Aluminum cans	98%	249
2	Tires	85%	320
3	Recycled paper	73%	3.393
4	PET	57%	294
5	Glass packaging	47%	470
6	Steel cans	47%	300
7	Office paper	29%	955.000
8	Long life	27%	59
9	Plastics	22%	953
10	Organic Wastes	5%	Not available

TABLE 5 Percentages and amounts of materials recycled.
Source: Campos, 2013 – based on data from CEMPRE, 2012b.

There has been an evolution in the percentages of urban solid waste recycling in Brazil, with a variation from 1% in 1989, to 12% in 2006, and 13% in 2008 (FIGUEIREDO, 2012). However, out of the total recycled, a small part is from the municipal selective collection programs, as shown in **TABLE 6**, with data refering to 2008.

Wastes	**Recycled t/year**	**Recovered by official selective collection programs t/year**	**Participation in formal selective collection** (%)
Metals	9.817,8	72.3	0.7
Paper/Cardboard	3.827,9	285.7	7.5
Plástic	962,0 (*)	170.3	17.7
Glass	489,0	50.9	10.4
Total	15096,7	579.2	

TABLE 6 Participation of formal selective collection in the amount of wastes recycled
Source: Brasil – 2012. Plano Nacional de Resíduos Sólidos 2012.

-PRECARIOUSNESS PREVAILS IN SELECTIVE COLLECTION IN BRAZIL

Solid waste recovery in Brazil has been performed with the unjustified exploi-tation of labor of the recyclable materials pickers, both by the local authorities and by the recycling industries. The magnitude of the challenges imposed by the National Program of Solid Wastes – *PNRS*, elaborated based on the National Policy of of Solid Wastes (*PNRS*), is a reminder of the deter-minants of backwardness in the sector and the possible ways to overcome them within new sustainability paradigms.

Therefore an in-depth analysis is proposed of the degrading situation of solid waste recovery in Brazil, the identification of the reasons why the legal aspects are not complied with, assigning responsibilities to the various actors involved and a proposal for the development of a new model that can meet the new challenges.

The recovery indices for recyclable wastes are relatively high, mainly due to the work of the hundreds of thousands of independent pickers, or those organized in associations or cooperatives, with or without the support of the municipal authorities. They are found in 72% of the municipalities where there is collective selection, according to the Entrepreneurial Commitment to Recycling (*CEMPRE*) (CEMPRE, 2012). This work can be considered one of the main reasons

why Brazil, for so many years has held the title of the world's leading recycler of aluminum cans, the recycling percentage corresponding to 98% in 2010 (CEMPRE, 2012). This collection is often done with human traction on the city streets, submitting the pickers to huge efforts and to constant accidents on the public roads. The number of pickers throughout the country is estimated as between 400 and 600 thousand (PNRS, 2012), many of them without any schooling, some without any identification papers.

In the case of the Facilities for the Recovery of Wastes (*IRR*), for their sorting, pressing, compressing in bales and sales, it is found that they are mostly operated informally by pickers' associations and cooperatives. There are few municipalities with work contracts with this category of workers. Independent of their magnitude, work relations between the pickers snd the public authority is mainly informal and precarious (CAMPOS, 2013).

It should also be mentioned that there are recyclable materials pickers picking wastes in open air dumps, in a picture of misery that does not fit a country that has been undertaking significant efforts in recent years to eradicate misery and reduce poverty. There men, women, children, elderly, circulating day and night together with animals, dodging trucks, machines, dying, having accidents, eating spoilt foods... This situation prevailed until June 2012, when the biggest dump in Brazil was closed, that of Jardim Gramacho, in the municipality of Duque de Caxias, which received about 7,500 tons of wastes a day, from the city of Rio de Janeiro alone, with about 1,700 pickers (RIO DE JANEIRO, 2012). This degrading situation can still be seen in the dump of Brasilia, the capital of Brazil, which receives more than 2 thousand t/day, where about 800 pickers work to prospect for recyclable wastes. As the dumps close, according to legal requirements, until selective collection is implemented and IRRs built for the pickers who work there, there may be a temporary reduction of recycled wastes.

Recyclable material pickers produce both goods and services, at the same time. They participate in the productive process of recycling, recovering the wastes and transforming them into raw material for industry. On the other hand, they provide services in urban cleaning, wich is the responsibility of the municipal authorities (ABREU, 2009). They are essential as professionals for the recycling chain and industry, and live in a process of social exclusion and inclusion, in a situation characterized by zones of vulnerabilities, fragilities and precariousnesses.

For Gonçalves-Dias (2009), there is a structural configuration in which the cooperatives are integrated to an organizational field presided by the logic of accumulation – the recycling industry, in which cooperative practices are

expresses in a disfigured way. Far from “emancipation“ and “dealienation”, the pickers reopresent the fragile field. Besides already being submitted to the precarious working conditions and low remuneration, they suffer second order exclusion if they prove incapable of meeting the expectations of efficiency demanded by the recycling industry and municipal selective collection systems.

A study developed by Burgos (2009) on structuring the recycling industry describes the process which involves different social agents and, in the urban work, has the following essential elements to be carried out. They are: abundance of urban solid wastes; poor urban workers remaining from the different production sectors, impoverished territories in which the set of activities inscribed at the base of this industry are performed. These poor urban workers carry out activities at the base of the recycling industry without becoming industry employees.

Burgos (2009) considers that the pickers are rather consumed as a work force and, under these conditions, they participate in the process of recovering raw material from the merchandise. This raw material will be consumed in a productive manner. In this sense, the consumption of the vital energy of the worker who is a picker helps increase the profit of industry by producing cheap raw material. This occur by wearing down their physical, psychic and emotional conditions. Also according to Burgos (2009), the professional training courses that seek to improve these precarious working conditions, and improve the pickers’ self-esteem are laudable initiatives, but they perversely correspond to an effort for them to produce more and better in the service of capital itself.

It is therefore noted that while the world of recycling is slow, at least to dignify the pickers work, it is quick in the capitalist development of the sector.

The experience of partnership with the pickers begun in Belo Horizonte in 1993, the acknowledgment of the work they done on the national scene by the United Nations Fund for Infancy – UNICEF, in 1997, with the implementation of the National Program of Garbage and Citizenship, and the campaign *Children in garbage never again*, were essential for the visibility of this category of workers (CAMPOS, 1997; GONÇALVES-DIAS, 2009). The focus on children opened up a space for debate on this subject in the national and international media. The institution of the National Forum on Garbage and Citizenship with an intersectorial and integral composition and actors from different fields of knowledge, showed the effort to change the scene of socioenvironmental degradation involved in handling waste.

In 2001, the National Movement of Pickers of Recyclable Materials (*MNCR- Movimento Nacional dos Catadores de Materiais recicláveis*) was

founded during the first national congress of this category, held in Brasilia, to deal with issues involving their activities (MNCR, 2012).

Already in 2002, the profession of picker was acknowledged by the Brazilian Code of Occupations (*Código Brasileiro de Ocupações – CBO*) of the Ministry of Labor. Until 2006, about 11 thousand had already been legally employed, with labor rights (BESEN E DIAS, 2011).

FIG. 10 President Dilma Rousseff and ministers at an event with pickers - São Paulo 22/12/2011; <*www.agenciabrasil.ebc.com.br*>; Symbol of the campaign *Children in garbage never again*, Mila Petrilo.

Law 11,445/2007 - *PNSB*, defines the employment of associations and cooperatives of pickers, acknowledged as such by public authorities, waiving bidding, and Law 12,305/2010 - PNRS defines the associations and cooperatives as priority agents for selective collection in Brazil.

In federal public administration, Decree 5,940/2006 chooses pickers as the beneficiaries of the materials selectively collected, and this becomes mandatory in government agencies. This decree was replicated in several Brazilian states and municipalities..

In 2003 the Federal government created the Interministerial Committee for the Social Inclusion of Pickers, to enable and articulate the federal policies for the pickers.

Since 2002, anually, in Belo Horizonte there is the National Festival Garbage and Citizenship, to hear the voice and claims of this category, discuss the management of urban solid wastes with the sociodemographic inclusion of the pickers. These events have already been attended by two Presidents of Brazil, besides several Ministers of State, artists, technical people, academic

researchers, public administrators, entrepreneurs and authorities of the federal, state and municipal governments.

EXPOCATADORES is an annual event of *MNCR* and the National Association of Carters and Pickers of Recyclable Materials (*ANCAT*) in São Paulo. Delegations from several countries in Latin America, India and Africa participate in the event (MNCR, 2012).

Art, with the pickers, was perennialized in films such as the short one which received international awards, *Ilha das Flores*, and long films *Estamira*, *Lixo Extraordinário* and *À Margem do Lixo*, in the works of artist Vick Muniz and even in a TV soap opera, such as "Avenida Brasil", showing characters who lived in the garbage dump that served the city of Rio de Janeiro.

Thus, pickers have played a role of reference in the world of work politics, arts, besides a highly visible organization on a national level.

All of this acknowledgment, however, was not enough to improve working and living conditions for the category.

In order to recover the wastes, in general, the authorities make it possible to use spaces or public real estate, to build facilities and equpment with federal government funds through the Ministry of Health – Funasa, Ministry of the Environment (*MMA*), National Bank of Economic and Social Development (*BNDES*), Bank of Brazil Foundation, and others. The donation of equipment for processing, pressing, baling, load lifting, scales has also been enabled by the recycling industry or scrappers, interested in ensuring that they always have a supply.

Since the majority of the pickers do not have any official employment ties, they do not have the right to paid vacation, nor to benefits such as the 13th salary, paid maternity leave, remunerated weekends, and they do not use the Individual Protection Equipment (*IPE*) and Collective Protection Equipment (*CPE*). This makes it clear that selective collection in Brazil is based on the exploitation of work and social injustice.

-THE CHALLENGE OF THE NEW LEGAL FRAMEWORK

The Federal Government, challenged by Law 12,305/2010, elaborated its National Plan of Solid Wastes observing the principles defined in the hierarchy of waste treatments. The Plan was discussed at public meetings in the

different regions of the country, and it is on the official site of the *MMA*. The garbage dumps in Brazil are to be eradicated by August 2014, and the amounts of recyclable wastes in sanitary landfills are to be gradually reduced.

SNIS data point to a mean per capita recovery of 6.8 kg/inhab/year in 2011. It is interesting to note that the recovery varied in terms of munipality populations, where those with a population of up to 30 thousand inhabitants had the best per capita recovery, corresponding to 22.6/inhab/year, while the larger ones, above three million inhabitants, had the smallest results, 0.4kg/inhab/year (BRASIL, 2011).

The goals defined by the *PNRS*, with a 20-year horizon to be updated every 4 years, require a great effort by all those involved in the responsibility shared by the life cycle of the products, ie., the manufacturers, importers, distributors and vendors, consumers and holders of public services for urban cleaning and solid waste management.

The goals for the reduction of solid waste disposed of in landfills, proposed for the country are 22% in 2015, 28% in 2019, 34% in 2023, 40% in 2027 until 45% is reached in 2031, which is the date covered by the plan, as shown in **TABLE 7**. In 2011 an average of 350 kg of waste was collected per inhabitant, which corresponded to 112 kg/inhab/year of recyclables, considering 32% (based on the 2012 characterization), according to the *PNRS*. Of this total, only 6.8 kg/inhab/year were recovered for recycling, corresponding to only 6% of the potentially recyclable total.

Considering a constant growth of generation per capita of wastes in Brazil, of 3.2% a year, if the current average is maintained, and the goals for the reduction of waste to be disposed of in landfills, foreseen in the *PNRS*, the amount of potentially recyclable wastes to be recovered per inhabitant per year for each plan review period was estimated. The value of 7 kg was found for 2011 (*SNIS*), of 25 kg/inhab/year in 2015, 33 kg/inhab/year in 2019, 42 kg/inhab/year in 2023, 51 kg/inhab/year in 2027, and, finally, 59 kg/inhab/year of recycled material for 2031, on the 20-year horizon of the PNRS, as shown in **TABLE 7**.

Challenge	Plan of Goals						
	Year	2011	2015	2019	2023	2027	2031
Reduction of dry recyclable wastes disposed of in sanitary landfills	Brazil (%) – PNRS goals	6	22	28	34	40	45
	Estimation of recyclables (kg/inhab/year)	112	116	119	123	127	131
	Recyclables to be recovered (kg/inhab./year)	7	25	33	42	51	59

TABLE 7 Reduction goals for the recyclable wastes disposed of in sanitary landfills
Source: Campos (2013), com base nas metas do PNRS – Brasil 2012.

Compared to what is already happening at this time in the European Community (121 kg/inhab/year), and also (71 kg/inhab./year) of composting, the Brazilian goal is rather timid.

Considering, further that the *PNRS* defined different goals for each region of the country, in order to reach the expected indexes, it is necessary to have a federative pact articulating the different segments involved in the shared responsible for the product life cycle in all government spheres.

LOOKING AT THE FUTURE -THE IMPACT OF THE NATIONAL POLICY OF SOLID WASTES

Sustainable production and consumption gained greater visibility in Brazil when the PNRS was approved by Law 12.305, of August 2010. It has an acute perception of the centrality of management and adequate handling of the wastes in the construction of an economy with a smaller environmental impact. Recycling becomes the preferential option for the management of urban solid wastes after the reduction at the source of generation.

PNRS, as well as the European Directive of the European Parliament (DIRECTIVA 2008/98/EC) of November 19, 2008, concerning wastes, believe in a new pattern of development and aim at protecting the environment and human health by preventing adverse impacts of waste generation. It is guided by the principle of the polluter pays, considering polluters those involved in the production, import, distribution and sales of packaged products and their packagings which, after use, are transformed into wastes.

In the European Community it covers all packagings and their wastes, recyclable or not. Their recovery is based on the financial contribution of those responsible for placing them on the market and this is delegated to the entity set up to obtain economies of scale and of scope (DIRECTIVA 2008/98/CE). The system covers environmental education; installation of voluntary delivery points; remuneration of the municipalities for collection, transport, sorting, baling of the materials and their sale. This system was implemented in 27 European countries by means of the Integrated System for the Management of the Packaging Wastes (*SIGRE*). The results achieved, according to EUROSTAT, in 2010, was approximately 25% of the wastes recycled (121 kg/inhab./year)

and 15% composted (71 kg/inhab./year). A significant part of the recycled wastes was collected at the ECOPOINTS in containers installed to receive paper/cardboard, plastic and glass, to serve every 200 residents (MONTENEGRO, 2013).

PNRS in Brazil points to enhancing the value of the wastes by returning them to the production cycle through Reverse Logistics. It requires the elaboration of waste management plans in the three spheres of government, established conditions for the elaboration and study of technical, economic and financial feasibility to make contracts for the services, and also the citizens' capacity to pay. It imposes a hierarchy to treat the wastes, allowing only the rejects, not the wastes collected to go to landfill.

It may be considered that there has been an evolution in the management of urban wastes in B razil, especially because of the substantial increase of door to door collection of the wastes and their disposal in sanitary landfills. As to the selective collection of the dry wastes, there was a small expansion and they are sorted mainly by cooperatives and associations of recyclable materials. There are few experiences of waste recovery operations employing the pickers according to the Consolidated Labor Laws (*CLT*), and most are informal.

Despite the results achieved in the expansion of household collection and disposal of wastes in sanitary landfills, the management of municipal cleaning services in general, can be considered fragile, improvised, and there is still a long way to go before it becomes professional throughout Brazil.

There is a historical deficiency throughout the production chain of waste management, ranging from planning, project elaboration, works and their provision. In several municipalities there is a lack of institutionalization of this sector, and it is even difficult to identify the agency responsible for rendering urban cleaning services and handling the wastes.

-SEEKING A NEW "CULTURE" FOR WASTE MANAGEMENT

The future of solid waste management in Brazil may be promising. Its design must take into account the initiatives of recent history which have innovative and creative aspects and signal possibilities of overcoming the barrier of immobilism and of failures.

The institution of the Ecological Tax on the Circulation of Goods (*ICMS Ecológico*) or socioenvironmental tax is an example that should be highlighted. Based on a state law, part of the revenue is transferred to the municipalities, with a different division, based on environmental criteria, including the appropriate disposal of solid wastes in environmentally licensed installations (ICMS ECOLÓGICO, 2013).

The National Forum of Garbage and Citizenship, whose objectives were to eradicate the dramatic situation of garbage picking by children and adolescents, and favor their social inclusion and, train the pickers to work in facilities that are adequate to recover wastes, was an initiative that mobilized a large part of the segments of the production chain of recycling. The initiative led by UNICEF innovated, seeking the integration of the social and environmental dimensions in waste management. It made it possible to implement various State and Municipal Forums of Garbage and Citizenship, with participation of society to promote the adequate management of wastes.

The Ministry of the Environment instituted and since 2003 has held the National Conference of the Environment (*Conferência Nacional de Meio Ambiente - CNMA*), which, in its 4th edition chose as its theme for debate the implementation of the National Policy of Solid Wastes.

This mobilization and communication with Brazilian society, in a participatory democracy process, is the essential instrument to promote environmental education, to discuss the planetary vicissitudes that haunt society, taking on positions of dealing with the management of the wastes, while seeking to build sustainable societies.

Since the Federal Policy of Basic Sanitation was approved in 2007, the National Policy of Solid Wastes in 2010, the National Plan of Solid Wastes in 2013, and having chosen the theme of solid wastes for the 4th *CNMA*, to be held in 2013, one might say that in the history of the country there will be no more opportune time to develop the operational modeling that congregates new bases for the sector.

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WASTE RECOVERY INTERNATIONAL PARTNERSHIP: A MODEL TO TRANSFER TECHNOLOGY AND CREATE LOCAL DEVELOPMENT

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Sweden is one of the countries in the world posses the cutting edge technology within the field of waste management and resource recovery sector for more than 30 years. City of Borås has an enormous impingement on Sweden in sustainable waste management by reducing the wastes ending in landfill, at the same time recovering valuable energy from the waste and recycling. In 2006, an association was founded for the knowledge and technology transfer from Borås to rest of the world called as *Waste Recovery – International Partnership*. This partnership includes University of Borås, Borås Energy and Environment (local municipality), SP technical research institute of Sweden, and about 20 other private companies and organizations with a primary objective to share Swedish knowledge and technology on sustainable waste management with other countries. The first collaboration was started with Indonesia in 2008 and from there it was expanded to most of the countries in Southeast Asia (Thailand, Vietnam, Cambodia, Laos and India), Latin America with Brazil, West Africa (Nigeria, Ghana), the USA, etc.

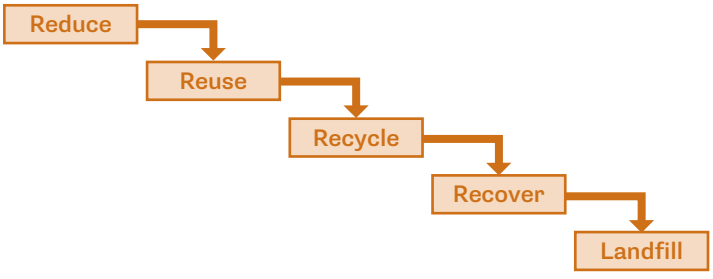

FIG. 1 Waste management hierarchy.

Waste is a waste elsewhere, but for Borås it is a precious raw material, which can be converted to value-added products such as biogas, electricity and heat. A positive economic system was designed back in 1986 to convert wastes generated in the city into value-added products. Though the population of the city was 100 000, the waste handling system in Borås was started as a pilot project with 3,000 households. Soon after the success of the pilot project, the complete city was integrated to the waste management system. Recently, some countries in Europe concentrate immensely on efficient handling of waste of which Sweden, Germany, Austria, Switzerland and Netherlands, end less than 1% of their waste in landfill. Nonetheless, Eastern European countries such as Romania and Bulgaria end up with more than 99% of waste in landfills. Many developing countries face a similar situation and in some countries, the condition is even worse. In most of the case, the lifecycle of waste ends in landfill leads to loss of land, loss of useful materials, generation of poisonous gases and leachate, climate change etc. However, with an economically attractive and efficient way, if energy from wastes could be generated, it helps to have a better environment for a better future.

Globally, more than 2.5 billion tons per year municipal solid wastes [MSW] is generated, in addition to agricultural, forestry and industrial wastes. According to a 2007 estimate, more than 1.5 billion tons end up in landfills, which is the easiest way to get rid of the waste by 'throw-away' strategy. From these landfills, about 70 billion m^3 methane could be generated. Throwing away the waste leads to health hazards, safety issues and loss of the valuable resources. Local municipality plays a significant role in collection, transportation and processing of waste, but many governmental companies dump the waste, as they cannot generate value and positive economy from

the wastes. Nevertheless, back in 1960s and 1970s, the waste was increasing beyond the acceptable levels, which led to the change in the laws and policies formulated waste management hierarchy. According to the waste management hierarchy, the wastes should follow *Reduce, Reuse, Recycle and Recover Energy* before it is dumped into the landfills.

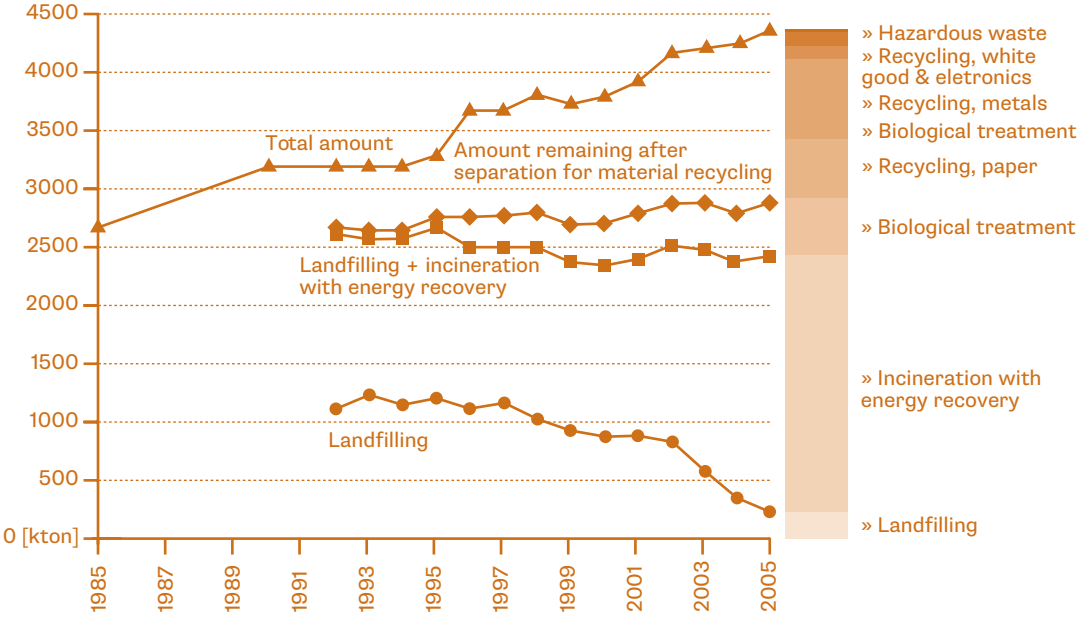

FIG. 2 Household waste collection and treatment in boras since 1985.

The success behind Sweden's waste management was supported by policy makers, public, industries, governments, universities and research institutes. Garbage collection fees, easy access to recycling stations, and most importantly continuous awareness campaigns, have increased the recycling and the energy recovery rates in Sweden significantly in the past decade. With respect to this regard some laws have been formulated and implemented, such as a ban on landfilling combustible waste since 2002 and organic wastes since 2005. Borås became a Zero Waste City in Sweden since 2004, but even before that about 96% of all glass packaging, 95% of metal, 86% of corrugated cardboard and 80% of electronic waste was recycled in Sweden. Non-recyclable wastes are treated through biological and thermal methods to recover energy out of it in the form of biogas, bio fertilizer, electricity and district heat.

UMBRELLA MODEL IN BORÅS

Before 1996, more than 40% of wastes were landfilled in Sweden. However, this situation changed with the implementation of innovative and integrated new technologies for waste separation, fractionation, biological treatment, and thermal treatment. As a result, landfilling reduced step-by-step to about 10% and then gradually approached zero landfill. Every people in Borås is a scavenger sorting the household waste into 30 different fractions, which is one way or the other recycled or converted to electricity, fuel or heat. Today, almost zero percent is landfilled, which is a magnificent achievement. The driving force behind this constant success is the cooperation of the citizens. Every kid is taught at school about how to sort the waste and the uses of recycling. Furthermore, many awareness programs are conducted in the city as sports and social activities for adults. Success story Borås waste management system has an umbrella facto such as citizens, policy and decision makers, research and development and children. An interesting aspect within the policy formulation is the floating tax rate for the waste treatment, i.e., if the waste sorting in the city is increased, the tax rate goes down and vice versa. University of Borås holds a noteworthy part with its wide research program to utilize the wastes into innovative value products.

Every household in Borås is given a booklet from the municipality which contains how to sort different wastes. Approximately, 130 different materials are listed in the booklet, so that the citizens could look what to be done with a particular waste. For instance, glass bottles are sorted based on their color as white and colored are distinguished separately. The lamps are segregated into bulbs, florescent, halogen, LED and other low energy lamps were treated separately. Recycling containers are placed in walking distances from each household all around the city to collect pure fractions of each material, which are sent to industries for further processing. To collect the household waste, the municipality provides white and black bags for every household for free. All compostable waste is collected in black bags, while other waste goes in white bags for combustion. The black bags and other organic flows are sent to biological treatment for production of biogas. More than 3 million m^3 biogas is produced every year, which is enough to run the buses in the city, garbage collecting

trucks and around 300 CNG vehicles in the city. The white bags and other industrial waste are sent to two 20 MW combustion plants, where 960 MWh heat and electricity is produced every day. The complete block diagram of household waste flow is shown in **FIGURE 3**.

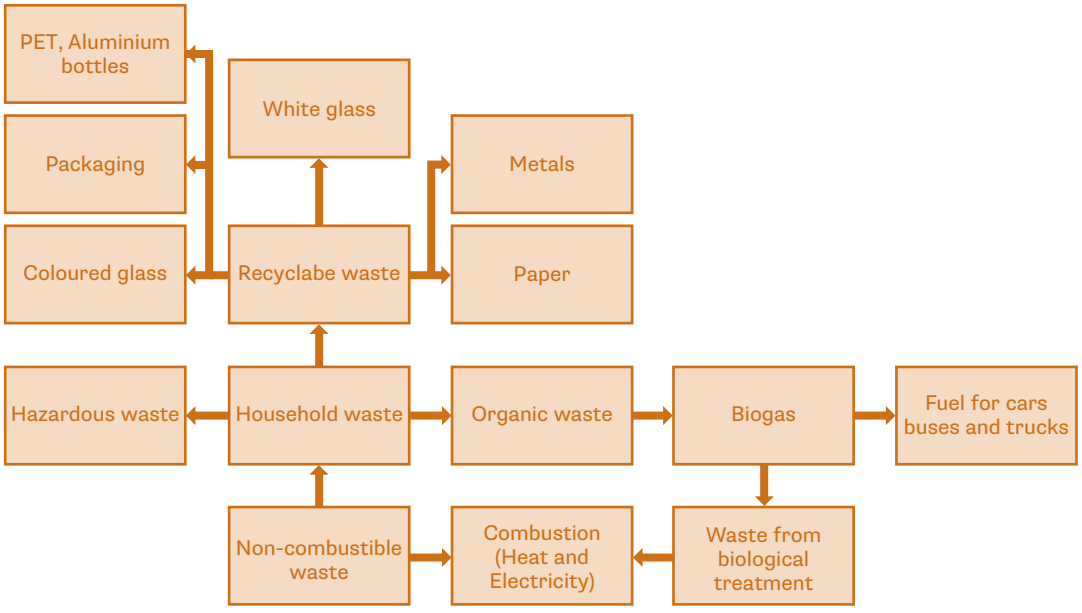

FIG. 3 Block flow diagram of household waste flow in Borås.

Another enthralling way of recycling is the deposit system so called "Pant" in Sweden. According to this system, every time a PET or aluminum bottle is bought by the customers, an additional fee of 1-4 SEK is charged depending on the size of the bottle, which is returned when the empty bottle is returned to the collection machine. All PET, aluminum and some glass bottles are recycled in supermarkets by collection machines. With this alluring method, more than 90% recycling of PET and aluminum bottles has been reached in Sweden. This system is very attractive and innovative method to manage waste in an efficient and economic way. Once a pure fraction of the waste is generated, it is not a waste anymore, a valuable raw material, which is open business for many recycling industries in Sweden. Fraction of waste recycled, sent for biological and thermal treatment is shown in **FIGURE 4**.

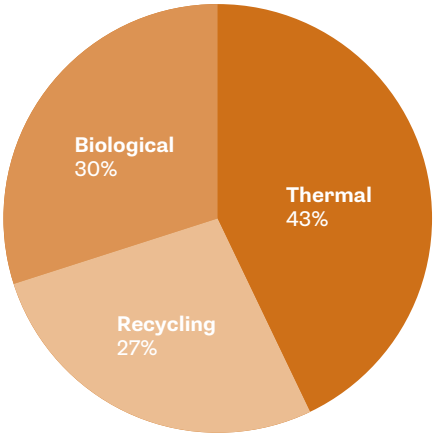

FIG. 4 Fraction of waste utilized in different forms in Borås.

WASTE RECOVERY INTERNATIONAL PARTNERSHIP

Astonishing efforts were made in the past to make Borås a zero waste city. The efforts and the experiences of Borås should be transferred to the needy and future generations for a sustainable future. A seed was sown in 2006 with this thought, namely Waste Recovery – International Partnership [WR]. WR is a knowledge transfer organization comprises of different players including the politicians, citizens, industries and the universities are brought under one roof and a Public, and Private Partnership was created. Within the partnership, a one-to-one network is formed, i.e., politicians from Sweden discuss the policy issues with the politicians from the partner countries, etc. WR includes City council of Borås, Borås Energy and Environment AB, University of Borås, SP Technical Research Institute of Sweden and about 20 different companies involved in waste management. Since its inception, the collaboration has spread all around the globe including Southeast Asia, Africa, Latin America, North America and Europe. The key objective of this non-profit organization is to change the world to a better place to live.

The alliance can be formed between different hierarchies for different countries. However, the initial source would usually be the fraternization of the universities. This pivotal strategy plays a major role to make a change in

the environment, as education is a powerful tool to initiate changes. University of Borås and its collaborating country university exchange faculty, researchers, and students at MSc and PhD level to develop an appropriate technology for the collaborating country. Different partners within the collaboration will come into play to achieve the goals. A research at PhD level called 'Sandwich-PhD' where a student spends half time in the home country and half time at University of Borås specially working on the research aspects related to home country. Furthermore, the coactions provide a special course for employees from companies and municipality Sustainable Waste Management in Borås for 1-4 weeks which is usually followed up by one week in collaborative country. In the second part, the local situation is analyzed to support strategic decisions for local development.

FIG. 5 Waste Recovery- International partnership collaborative model.

CASE STUDY: INDONESIA

Since its inception in 2006, a strong collaboration until date is progressing effectively with Indonesia. The partnership was first created between one of the oldest and largest university in Indonesia named Gadjah Mada University

and University of Borås, Sweden. The goal of this partnership was to create a competence on waste management sector, research and development on waste sorting, treatment and biogas. Sleman municipality was also active in the collaboration where the fruit wastes from the market were converted to biogas for producing electricity. Every day the fruit market produces 4-10 tons of waste, which ends up at dump sites. After the installation of the biogas digester, 500 KWh electricity is generated every day. Total number of trucks used to carry the fruit waste was reduced to one after the installation of digester; previously it was 14.

CASE STUDY: BRAZIL

Waste Recovery has started its collaboration with Brazil, since 2009. University of Borås and its collaborating partners such as Borås Energy and Environment AB, FOV Biogas AB are working closely with different municipalities, academia and industries in Brazil on effective waste management. Universities such as *USP* (*Sao Paulo*), *UFRJ* (*Rio de Janerio*), and *FURB* (*Blumenau*) are involved in collaboration with University of Borås to for the effective waste-management solutions. In Blumenau the collaboration also involves the municipality organization AMVVI. The goal is to create a long term Sustainable Waste Management solution here. As a part of it, cost-effective digesters designed at the University of Borås is being further developed and tested at the universities mentioned above. Based on the testing, the digesters will be installed at different *favella's* and universities for the conversion of waste into value added products such as biogas. Zero Waste projects are planned at the campus of *UFRJ* and *USP*. Now Stena Metall AB, SP, The Technical Research Institute of Sweden and other industrial partners are also involved in this joint venture. WEE projects are planned that also involve social inclusion. A major funding for this successful venture is though the funding provided by Sweden's innovation agency VINNOVA. The bilateral agreement between Sweden and Brazil strongly supports this development as shown in the Sweden/Brazil ecoinnovation event in *RIO 2013*. Representatives from the government, universities and companies from Sweden and Brazil took an active part in this event. This event was hosted by Brazil´s equivalent to VINNOVA, FINEP and VINNOVA.

The earlier joint venture with Brazil and Borås had brought out very successful results such as that students from *UB*, *UFRJ* and *FURB* have taken part of different exchange program through which they learn the different

aspects of the waste management. Furthermore, the students now continue the knowledge gained through projects at different universities in Brazil. Every year students spend half time of their studies in Borås and the remaining in their home university leasing to a concrete knowledge transfer on waste management sector. A successful start of the Sweden-Brazil sustainability project was a big workshop "*Resíduos sólidos urbanos e seus impactos socioambientais*" held at *USP* in 2010.

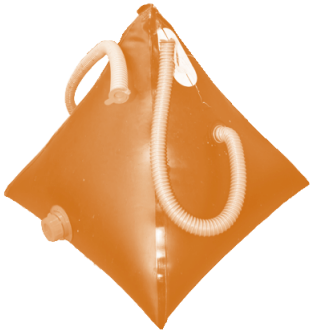

FIG. 6 Lab scale bio-digesters. Source: Personal.

An important continuation was the seminars based on biogas and WEEE hosted by *IIEE-USP* with representatives from Brazilian and University's as well was related Brazilian and Swedish company's involved.

University of Borås is invited to conduct workshops in various universities and municipalities all around the world, which is starting point for international networks and relationships for collaboration. Contacts created are shared with collaborating partners for possible collaborations. In parallel, the governments are connected through embassies for making a smooth and faster collaboration. When a collaborative initiative is taken, a mutual exchange of visits between Borås and the partner cities is to be started. The meetings are financed by the collaborating parties or international organizations or by different authorities in Sweden. After this initial step, decisions about the future collaborations are to be taken. WR in Borås expects the collaborative part to create a similar Public, Private Partnership. A good startpoint is to start student exchange and to organize the introduction course for mayors and other important people from the local society. UNCRD together with the Waste Recovery partnership will host IPLA GLOBAL FORUM in Borås 2013. IPLA is very much based on International Public Private Partnerships.

FINAL CONSIDERATIONS

Borås is open to transfer knowledge and technology on waste management in a context of open innovation. Borås is open to share its knowledge developed during the last 30 years. With the Public, Private Partnerships created in Borås in collaboration with a Public, Private Partnership in another country, a strong productive international platform is created. The long term vision has to be a planet without waste but just resources.

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WASTE SOCIO-TECHNOLOGICAL TRANSITIONS: FROM LANDFILLING TO WASTE PREVENTION

MARÍA JOSÉ ZAPATA CAMPOS
PATRIK ZAPATA
ULLA ERIKSSON ZETTERQUIST

The transformation of packaging waste from a problem into a resource has had significant consequences for a more sustainable use of natural resources and even the reduction of potential CO^2 emissions and its contribution to the climate change. Material recycling leads to separated material being able to replace other production or construction materials. It also means that the consumption of the amount of virgin material decreases and saves energy. Despite the growing material recycling rates, the amount of waste per person, and packaging waste among others, continues to increase. High recycling rates can be pointless if the amount of waste does not decrease. This is an example of how well established waste recovery regimes can stand in the way of more sustainable forms to handle waste (CORVELLEC ET AL, 2013) and, ultimately, hinder the development towards the EU objective (2008) of making waste simply unbecome.

This chapter explores the challenges faced by waste regime transitions based on the case of the historical evolution of household waste management in Sweden. The chapter first introduces transition studies' multi-level framework in combination with the notion of *lock-in* as the theoretical context to explore the Swedish case. Then, the evolution of waste handling socio-technological systems and the challenges faced specifically by waste packaging recovery models in Sweden are presented. Finally, the cases are discussed under the prism of the theoretical framework.

A MULTI-LEVEL FRAMEWORK ANALYSIS FOR UNDERSTANDING WASTE REGIME TRANSITIONS

In order to explore the shifts in socio-technological practice occurring in waste management we make use of the notion of *lock-in* (UNRUH, 2000) in combination with transition theory. Combining these leads to an interdisciplinary approach which enables us to understanding the challenges of sustainability by focusing the coevolution of technology and society (transition theory) and the more specific societal conditions for handling waste (GEELS, 2002; KEMP AND LOORBACH, 2006; KEMP ET AL., 1998).

Transition research provides important insights into factors at various levels which shape how socio-technological change happens. Transition research has shown how improved knowledge can lead to innovations that replace previous and stable technologies; how new regulations prompt change in technologies; or how institutionalized socio-cultural values such as environmental justice concerns facilitate the diffusion of technologies.

The process of driving technological change is, however, not exempted of power struggles; what appears to be most efficient, or appropriate is one-sided, and biased interests and contestation shape the transition pathway (LAWHON, 2012; MEADOWCROFT, 2005; 2009; SHOVE AND WALKER, 2007).

The transition studies' multilevel framework has been proved to be useful to describe the coevolution of technology and society through interactions between three levels: the micro level, the macro level, and the meso level. These interactions are seen to support or hinder a transition (ELZEN ET AL, 2004; GEELS, 2002; KEMP ET AL, 1998; LOORBACH, 2007; ROTMANS AND KEMP, 2008) towards new predominant socio-technological orders. At the lowest or micro level of the framework are socio-technological niches: protected spaces where learning and innovation occur without being constrained by economic and political arrangements (GEELS, 2004; KEMP ET AL, 1998; NILL AND KEMP, 2009). The macro level of the framework is the socio-technological arrangements: the social, political, and economic context in which socio-technological coevolution takes place. This context is made up of environmental conditions, the state of economic development, and relatively stable social values and principles such as existing political structures. The meso level is the socio-technological regime: the existing rules and patterns that inform current practices. These rules are often built upon habits, values, beliefs, and social contract. The socio-technological regime includes industrial networks;

techno-scientific knowledge; sectoral policies, laws or public management structures; markets and user practices; well established infrastructures and technologies; and cultures, symbols and meanings.

Transition studies contend that new technologies first emerge in particular market or technological niches where they are protected from economic and political arrangements and developed. These technological niches either fail or break through in markets; and replace, or co-exist with, existing systems at the socio-technological regime under certain conditions such as: the stabilization of the technological innovation in a prevailing design, increasing support from influential actors; environmental/institutional changes; decline of the existing regime (GEELS, 2002).

Unruh (2000, 2002) used the notion of carbon *lock-in* to describe how technological, political, and social forces co-build a techno-institutional complex that prevents (or *locks-in*) the diffusion of carbon-saving technologies. The notion of *lock-in* adds new and interesting insights to the transition studies research. In accordance with transition studies, technological systems and socio-technological change are embedded in coalitions of industry networks, private and public institutions such as trade unions, business networks or public bodies. These coalitions *lock-in* producers, users, and regulators in nets of technologies, legislation, standards, physical infrastructures, politics, and cultural norms. The coalitions that benefit from a *lock-in* often resist any change, either incremental or radical.

Infrastructures with a sustainability record may evolve over time into a *lock-in* that slows the emergence of more sustainable urban infrastructures, as Corvellec, Zapata Campos and Zapata (2013A) show, based on the case of waste incineration in Gothenburg, Sweden. Taking leads from Unruh (2000, 2002), they explain how four rationales of 'waste incineration *lock-in*' (institutional, technological, cultural, and material) slowed the emergence of more sustainable and innovative solutions, such as waste-to-biogas production or more active waste prevention policies (CORVELLEC ET AL., 2013A).

Socio-technological change can emerge from: a crisis in the existing technology; regulation; technological breakthrough producing a cost break-through; changes in tastes; niche markets; or scientific results (COWAN AND HULTÉN, 1996). Hence, socio-technological transitions (or un-locking socio-technological regimes) require a combination of collective actions that promote alternatives, a critical mass or social and political recognition of a need for social action, and a focusing event that acts as a catalyst.

EVOLUTION OF WASTE MANAGEMENT SOCIO-TECHNOLOGICAL SYSTEMS IN SWEDEN

In Sweden, the Packaging and Newspaper Collection Service (Förpacknings-och Tidningsinsamlingen AB, FTI), a privately owned system of extended producer responsibilities, answers for the collection and processing of specific packaging waste streams such as newsprint, plastic, paper, metal and glass packaging. Municipalities have the responsibility for the collection and processing of the household waste that is not encompassed by the extended producer responsibilities system. In this section, the historical evolution of treated volumes of household waste in Sweden is used to explore how different predominant socio-technological pathways (landfilling, incineration, material and biological recycling, and waste prevention) emerged, co-existed, co-evolved or/and competed.

In 2010 inhabitants in Sweden produced an average of 463 kg of household waste per person, down from 513 kg in 2007. Incineration is the most common treatment method (49%) for household waste, followed by material recycling (36%) and bio- logical treatment (14%); landfills receive only 1% of household waste (AVFALL SVERIGE, 2011). Recycling rates have been already high in 2001 at 40 % (both material and biological recycling) and by 2010 Sweden had reached 49 %, just 1% less than the target of 50% set out in the Waste Framework Directive by 2020 (EUROPEAN ENVIRONMENT AGENCY, 2013). The landfill tax, and landfill ban on sorted combustible waste, which came into force at the beginning of the 2000s played a vital role in the diversion of solid waste management from landfill in favour of recycling and incineration.

FIGURE 1 shows the evolution of treated volumes of household waste in Sweden since 1975. Landfilling was predominant until the mid 1980s. Its disappearance (1% in 2012) was accelerated with the introduction of landfill taxes in the 2000s. Waste incineration emerged in the 1970s associated to district heating networks and prompted by the oil crisis and search for alternative fuels. Both waste incineration and material recycling technologies have experienced a constant growth the last decades in association with the decline of landfilling. Waste incineration is however predominant over material and biological recycling although all handling technologies show similar growth rates. Only in the 1980s as a result of the incineration ban in landfilling regained some temporal predominance, which soon ceased when waste incineration was re-established. In the following we describe the evolution of these three waste handling socio-technological pathways.

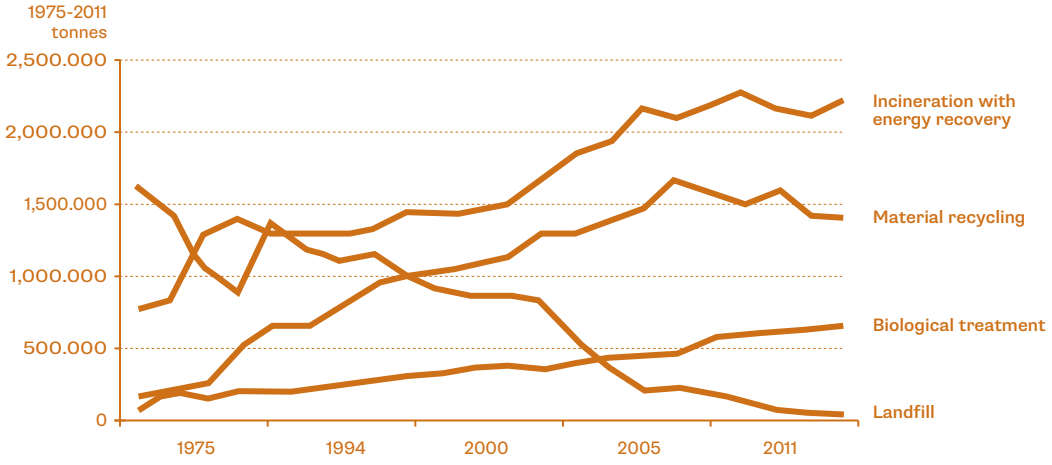

FIG. 1 Treated volumes of household waste in Sweden (1975-2011).
Source: Waste Management Sweden 2012, P. 11

TOWARDS LANDFILLING LESS REGIME

The Swedish law (1999:673) introduced the landfill tax, which was put into effect in the beginning of 2000 (EUROPEAN ENVIRONMENT AGENCY, 2013). The landfill tax had a significant impact on the amounts of municipal solid waste landfilled and has led to a firm decrease of landfilling to 1% in 2012. Despite taxation affected radically landfilling reduction, landfill diversion is also attributed to additional measures. For example, the landfill tax coupled in 2001 with a landfill ban on combustible waste. Furthermore the landfill tax increased in the following years (2002, 2003, 2005...). Similarly, in 2005, a new landfill ban on organic waste was introduced. The combined measures succeeded to halve the amount of landfilling until 2004. In 2009, all landfills not complying with the requirements of the regulation (2001:512) on landfilling were closed down and as a result the number of operating landfills was almost halved (SWEDISH ENVIRONMENTAL PROTECTION AGENCY, 2010). The decline of land-filling has affected the growth of both waste-to-energy and material recycling.

FROM LANDFILLING LESS REGIME TOWARDS THE HEGEMONY OF WASTE-TO-ENERGY REGIME

Waste-to-energy has been a well-established socio-technological path established in Swedish cities since 1970s. Corvellec et al explained how cities became locked into waste incineration, today's waste management system *"is an inheritance of political choices that originated in other contexts and for other purposes"* (CORVELEC ET AL, 2013, P. 37), referring to rises in oil prices in the 1970s that made it economically interesting to produce energy from waste for the large district heating systems characteristic of many Scandinavian cities as well as the need to divert the increasing amounts of waste from landfills. This is how waste management networks became interlocked with district heating networks in many Scandinavian cities. As a consequence, waste management networks experienced a transition pathway towards a new socio-technological order where incineration co-existed and sometimes competed with landfilling and later material recovery (or recycling). Later in the 1990s waste incineration was even more stabilized (or locked-in) as a result of new European environmental directives, translated in Sweden in landfilling taxes in the 2000s, that aimed at reducing dramatically landfilling targets. These choices, as Corvellec et al explained (2013, P. 37), *"have been supported by a systematic development of technological competence and massive economic and symbolic investments in incineration."* In the political and mass media discourse incineration was represented as providing both economic and environmental returns, and enabled the economic growth of the region.

FROM LANDFILLING-REGIME TOWARDS MATERIAL RECYCLING

The rise of the landfill tax in 2003 affected significantly the recycling rates, both material and organic, showing an expansion in the amounts of recycled municipal solid waste (EUROPEAN ENVIRONMENT AGENCY, 2013). The amount of municipal solid waste diverted for material recycling improved 19% from 2004 to 2007. In 2006 the increase of landfill tax together with the introduction of the incineration tax (ETC/SCP, 2009) shoved up the ascent of material recycling. As a result, since 2006 material recycling has reached

and stabilized up to 49% of municipal solid waste generated. According to the European Environment Agency (2013) the lack of new measures in the following years, hindered further increase of recycling rates.

Interestingly the success of recycling has left Sweden with too little material to power some of its waste-to-energy facilities, requiring it to import heavily from neighboring European countries such as Norway (INTERNATIONAL RECYCLING, 2012) that lack waste-to-energy or recycling infrastructures and need to divert waste from landfilling. Waste import to Sweden is, however, hardly a long-term solution, and instead efforts should be directed towards recycling, reuse and waste prevention. This episode (namely the shortage of waste to feed waste incinerators) is an example of how incineration and recycling technologies co-exist and compete to secure access to waste and, therefore, threaten existing industry coalitions, social habits and practices, and investments behind these handling technologies.

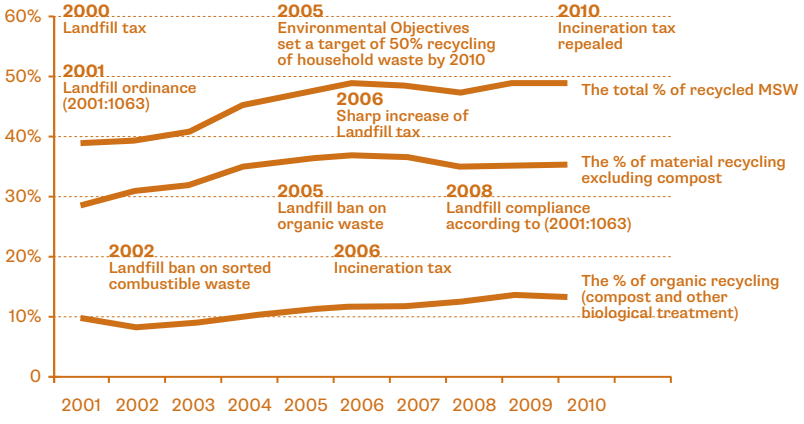

FIG. 2 Recycling of MSW in Sweden and important policy initiatives
Source: Eurostat 2012, P. 14.

Finally, a recent report published by the European Environment Agency showed different trends in recycling of packaging waste and municipal solid waste. Most European Union Member Countries, including Sweden, have producer responsibility schemes on packaging waste and the packaging waste is therefore not always regarded or reported to Eurostat as municipal solid waste. According to this report (EUROPEAN PROTECTION AGENCY, 2013), the recycling of packaging waste seems to remain more or less stable at around 800 000 tonnes throughout the years and therefore does not correlate with the development of recycling of municipal solid waste.

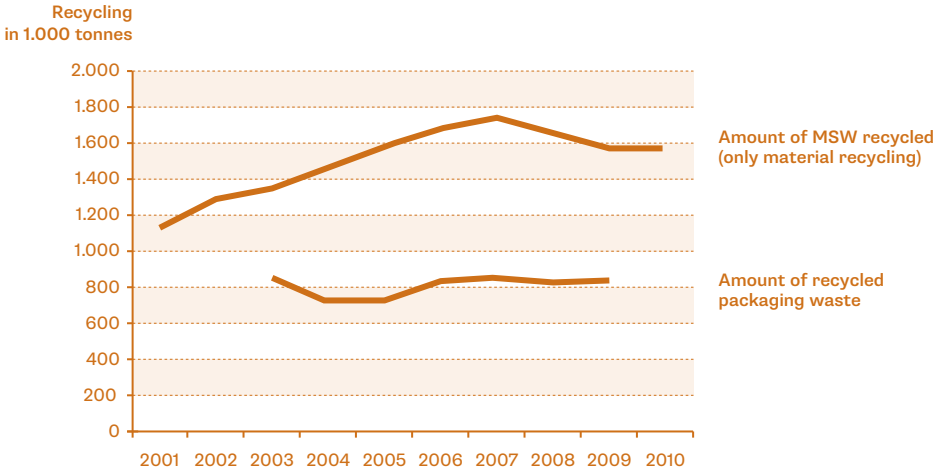

FIG. 3 Comparison of packaging waste recycled and MSW recycled (material recycling). Source: Eurostat 2012, P. 12.

Material recycling of household solid waste has largely relied on FTI, the Packaging and Newspaper Collection Service. Despite progress in recycling rates and further achievements, the association has failed to reduce packaging waste rates in Sweden, as they have remained stable or increased. Swedish municipalities have struggled to get back the waste packaging collection service, by arguing, among other reasons, that municipalities would better succeed to prevent the amount of waste as they do not hold any commercial interest in the packaging industry.

THE TOP OF THE WASTE HIERARCHY: CHALLENGES TO THE TRANSITION TOWARDS 'WASTING LESS' SOCIO-TECHNOLOGICAL REGIMES

The Swedish waste management plan 2012-2017, *From waste management to resource management*, following European directives, shifts the focus more than its predecessor from reducing landfilling and increasing recycling, to reducing the quantity and hazardousness of waste; and includes many initiatives and practices to prevent waste although these are mostly qualitative and advisory in nature.

Preventing waste implies both changes in the manufacturing of goods and services and the direction and level of consumption by avoiding unnecessary products, reducing (using fewer resources to manufacture the same product or service and buying goods with a longer life span) and reusing strategies (borrowing, sharing, co-owning). Already existing projects (SEE AVFALL SVERIGE, 2011) to encourage increasing reuse carried out by Swedish municipalities are the *Lånegardaroben* (the Borrow Closet) in Stockholm, or *Klädbiblioteket* (the Clothes Library) in Umeå, supporting the exchange of second-hand clothes; the *ReTuren* project in Sundbyberg, in partnership with second hand store Myrorna, that collects bulky waste and reusable products from individuals unable to go to a collection station (AVFALL SVERIGE, 2011). In Lund, ICA food store started the *Resurskocken* (the Resourceful Chef) project, to cook lunch out of groceries with short expiration date. Even city planning in the Fullriggaren quarter, Malmö, implemented a car pool service system in cooperation with Sunfleet carsharing.

Reducing food waste has been encouraged in different municipal projects (AVFALL SVERIGE, 2011; SWEDISH ENVIRONMENTAL AGENCY, 2012). For example, less school cafeteria food is wasted as a result of different campaigns conducted by the municipalities of Gothenburg or Halmstad to rationalize food at kitchens and to aware students about the amount of food they consume (AVFALL SVERIGE, 2011).

To demonstrate, measure and give feedback on the amounts of generated waste has also been a strategy implemented in other municipalities. The rationality behind is to visualize the amount of waste produced and to reconnect citizens' consumption and waste production habits (ZAPATA CAMPOS, 2013). For example, through weight-based billing Gothenburg successfully decreases the amounts of generated waste (CORVELLEC ET AL, 2013B). On average, the weight of waste from containers and garbage bags in municipalities with weight-based billing is 20 percent less compared to those maintaining volume-based billing (DAHLÉN AND LAGERKVIST, 2008). Or by garbage trucks parades as in Gävle, illustrating the amounts of waste generated by city inhabitants each day (AVFALL SVERIGE, 2011).

A few municipalities have also attempted to stimulate households to work with waste prevention. In Gothenburg, the project *Leva Livet* (Live Life) encouraged a number of families to start a sustainable living, and to reduce the generated waste and increase their recycling rates, among other things (AVFALL SVERIGE, 2011).

Similarly in the city of Gothenburg new urban waste infrastructures such as the Alelyckan recycling and reuse park have been created in an effort to move upward the waste hierarchy, towards material recovery and waste prevention strategies (AVFALL SVERIGE, 2011; ZAPATA AND ZAPATA CAMPOS, 2013). The Alelyckan park has a recycling station, a reuse centre for construction material, a second-hand shop, a return house with a workshop for repairs, an eco-café, an eco store, and a picnic area. Visitors can donate reusable materials instead of simply recycling them, and to buy donated (sometimes repaired) goods in thrift shops located in the park. Products that are still in good condition are sold for reuse in the shops; the rest are sorted out for material recycling or energy recovery. Reusing products in the eco-cycle park annually prevents 360 tonnes of waste that otherwise would have been incinerated, or recycled (AVFALL SVERIGE, 2011). The environmental benefits amount to savings of 1300 tonnes of carbon dioxide equivalents and 5700 MWh of saved primary energy, compared with a regular waste packaging recycling park. Unlike ordinary recycling stations, Alelyckan has a recreation area, a cosy eco-café, and a clean and odourless environment; a place that radiates happiness, a deliberately created "positive environment" where sorting waste becomes a leisure experience (ZAPATA AND ZAPATA CAMPOS, 2013).

CONCLUDING DISCUSSION: WASTE MANAGEMENT SOCIO-TECHNOLOGICAL REGIMES – TRANSITIONS AND CHALLENGES

The historical evolution of household waste in Sweden serves to explore how different socio-technological pathways (landfilling, incineration, material and biological recycling and waste prevention) emerge, co-exist, co-evolve and compete. It also serves to understand the challenges faced in the socio-technological transitions: from landfilling, to 'landfilling less', and towards 'wasting less' regimes (CORVELLEC AND HULTMAN, 2012).

Waste incineration emerged in the 1970s interlocked to district heating networks, characteristic of many Scandinavian cities, and urged by the oil crisis and search for alternative fuels. Both waste incineration and material recycling technologies have experienced a constant growth in the 1980s and 1990s in

association with the decline of landfilling. However, waste incineration has always been predominant over material and biological recycling.

Changes at the macro level are challenging waste incineration hegemony and leading towards a new socio-technological transition. The new European Waste Framework Directive (EU, 2008), as well as the new Swedish Waste Management Plan states that legislation and politics of waste management should be guided by the waste hierarchy and waste prevention is at the top of the hierarchy. As a consequence waste minimization should be prioritized over both energy and material recovery (HULTMAN AND CORVELLEC, 2012).

Coalitions of actors can also challenge existing rules and waste management models. For example, Swedish municipalities represented by Swedish Waste Management, the Swedish association of municipal waste management companies, have for years struggled to get back the collection of household waste packaging from FTI. The municipalities argue that, unlike FTI, they will succeed to reduce waste packaging since they do not hold commercial interests in the packaging industry such as FTI does. In 2012, an official report (SOU 2012:56) on waste management recommends to give part of the collection competence back to municipalities. Although it is still to decide how the waste packaging and recycling services in Sweden will be organised future wise.

Socio-technological transitions are also shaped at the micro level by hegemonic *lock-ins* and techno-institutional orders existing in and within cities (MARVIN ET AL, 2011). For example, renewals or extension of infrastructures, such as the construction of a fourth oven in the waste incineration plant in Gothenburg (CORVELLEC ET AL 2013), open windows for challengers to introduce and discuss new and more sustainable technologies (GRAHAM AND THRIFT, 2007; MOSS, 2011) that eventually could lead towards new socio-technological transitions.

Waste management transitions are also leaded by challenges posed by environmental political parties and environmental movements embedded simultaneously at global and local scales. Corvellec et al (2013) reported how waste incineration *lock-in* in the Gothenburg Metropolitan Area was challenged by the green party that opposed to the construction of a new oven and supported instead the construction of biogas plants and waste prevention strategies. As Corvellec et al (2013) show, challenging a socio-technological order, such as waste incineration, is however perceived as a risk both by society and by the dominant coalitions. Eventually, challengers such as green party politicians, have the courage to take such a risk.

New ideas, believes, values and narratives that challenges the existing socio-technological regime of waste as a resource, can succeed or fail. Environmental concerns flagged by environmental social movements and political parties might not succeed to introduce radical changes in dominant socio-technological regimes. However, in time they can contribute incrementally to destabilize, as a succession of events, and in co-ordination with other factors, the existing regime (GRAHAM AND THRIFT, 2007).

Ideas, debates and narratives of 'wasting less' (CORVELLEC AND HULTMAN, 2012) challenging the existing regime are also supported through pilot programmes and policies, such as the European Waste Prevention week celebrated in Sweden since year 2009, which has led to a number of innovative initiatives lead by municipalities to prevent waste (AVFALL SVERIGE, 2011). These respond to what in transition studies has been named as a transition arena: a place outside the pressures of politics and economics in which visionary leaders can define, discuss, and develop responses to particular challenges (LOORBACH, 2007; VAN BUUREN AND LOORBACH, 2009). These innovative niches are defied to be spread out and become institutionalized. The new Swedish Waste Management Plan echoes these innovative experiences to exemplify how municipalities can respond to the challenge to prevent waste.

Households, citizens, corporations and public authorities are already engaged in developing new ways to relate to waste through, for example, re-using practices or slowing-down consumption practices, as those reported by Swedish municipalities. These new forms of organising the socio-materiality of waste (HULTMAN AND CORVELLEC, 2012), as transition arenas, open for new opportunities for unlocking socio-technological innovations and new hegemonic regimes.

Swedish municipalities are challenged to shift towards 'wasting less' socio-technological orders. New infrastructures and practices such as the Alelyckan ecocycle park have the ability to change the socio-materiality of waste, that is, how we engage with the materiality of waste in the course of our everyday lives (GREGSON, 2009; CORVELLEC AND HULTMAN, 2012; HULTMAN AND CORVELLEC, 2012), 'to foster a new ethics of environmental protection and responsible consumption that leads to the reduction of what might become waste in the future' (ZAPATA CAMPOS AND ZAPATA, 2013, PAGE 144).

The challenges to drive the transition from waste recycling towards 'wasting less' regimes are however many. According to Corvellec, Ek, Zapata Campos & Zapata (2013) difficulties are to be found along the multi-level framework of waste regime transitions, such as: *lock-ins* in local waste infrastructures (CORVELLEC, ZAPATA CAMPOS & ZAPATA, 2013A);

well-established consumption patterns, believes and available information; a fragmentation of responsibilities across international, national, regional levels, or public and private actors (DAVOUDI, 2009); a lack of appropriate political instruments and resources (UNEP, 2010); a need for new knowledge systems, capacities and organizational structures (NILSSON ET AL, 2009); or the marketization of waste as a long-term challenge to a sustainable development (ZAPATA AND HALL, 2013). Our ability to overcome these challenges and re-establish new and more sustainable connections between the collective actions of involved actors is vital to achieve this aim.

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PACKAGING DESIGN AND SUSTAINABLE MANAGEMENT OF SOLID WASTES; THE EXPERIENCE OF A BRAZILIAN COSMETICS MANUFACTURER

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Natura, founded in 1969, is a Brazilian cosmetics manufacturers, a market leader selling its products directly in Latin America and France through a group of over one million independent consultants.

Since the beginning its path to growth has focused on principles and values acknowledged since the 1990s, with the concept of sustainable development, a relevant component that permeates the company's planning in the form of socioenvironmental performance indicators and goals.

In a constantly evolving cycle, the company's sustainability strategy seeks to take a broader look at the impacts generated throughout its chain of values, including suppliers and logistics network ranging all the way to the stages of product disposal, involving the consultants and consumers in this process.

In this context, based on the methodology for the Life Cycle Evaluation (ABNT NBR ISO 14040:2009) that has been used for over ten years by the company, Natura began to measure the environmental impacts of its packaging and, in 2007, the first corporate inventory of Green House Gases [GHG] was performed according to the guidelines propsed by the *GHG Protocol* (WRI/WBCSD, 2004).

The role of the inventory is to quantify the individual environmental impact of each product throughout its life cycle, mapping the most representative processes and serving as a foundation to promote and monitor the reduction achieved by the company.

Similarly to the GHG emissions. in 2010 the company began to build a strategy for the broader management of the solids wastes, inspired by the integrated life cycle management process. The aims were to identify the generation of impacts in the different links in the production chain, and to analyze the disposal of solid wastes, taking into account the Brazilian disposal scenario in order to promote the prevention and reduction of wastes and rejects generated by the company chain activities.

In this context, this chapter presents a few interlinked initiatives for sustainable management of solid wastes beginning with an overview of this program. Then it shows how packaging recyclability studies were used to elaborate a corporate inventory of solid wastes. Finally, a few examples of application are shown through case studies performed in recent years.

THE SOLID WASTE PROGRAM OF NATURA

Natura believes that the generation of positive social and environmental impacts requires effective management of solid wastes based on a collective effort involving corporations, authorities, picker associations, civil society and other links in the production and consumption chain. It is from this perspective that the company develops its solid waste management program which covers collaborators, partners, third parties and consumers. The objective is to comply with the National Policy on Solid Wastes and to surpass it, transforming waste management into leverage for the generation of value for all publics with whom the company is involved.

Historically, Natura has been working consistently on this topic. In 1983 the company was the first to launch a refill for some of lines of product making it possible to extend the work life of its regular packaging.. In the 2000s, Natura build a waste central, at its Cajamar production unit, with a view to disposing adequately of the wastes generated in the industrial process. Since 2005, it has insistently sought ecoefficiency by reducing the weight of its transport boxes, elimination of the cartridge (secondary packaging) for certain product lines, using post-consumption recycled material in PET and paper packaging of the EKOS line and reducing the number of pages of its magazine, Revista Natura.

Despite this history, creating a specific program to manage solid wastes allows guiding and expanding efforts on this topic. Thus, strategic objectives are the reduction of waste and reject generation throughout the value chain, the

significant increase in the use of post-consumption recycled materials, *ecodesign* of packaging, reverse logistics and the commitment of our publics to conscientious consumption.

NATURA PACKAGING RECYCLABILITY STUDIES

In the Technology and Design pillar of the Natura Solid Waste Management Program, in 2011, the first study was conducted to evaluate the recyclability potential of Natura packaging, from the viewpoint of 5 Recyclable Material Pickers' Cooperatives in the State of São Paulo, the most representative Brazilian region in volume of sales of the company products.

Each cooperative received 258 packaging components selected from a list of the products most sold by the company, to perform a comparative analysis of the results at the end of the project. To simulate the stage of use by the final consumer, all the contents of the products were discarded and only the decharacterized packaging was separated in boxes and taken to the cooperatives.

Each cooperative performed the sorting and packaging classification processes according to specific procedures and based on the potential for commercialization (offer/demand) of materials, separating the components as recyclable or non-recyclable.

After sorting, the components were classified into 14 categories of recyclable materials named by the cooperatives as: carton paper, OS, PP, HDPE, Aluminum, iron, PET in the white/blue;green colors, plastic scraps, PP bottle tops, white glass, colored glass, colored PET, white supermarket bags and PVC.

Besides the quantitative sorting, a qualitative analysis was conducted aiming to identify the influence of the separation process (disassembling) of the packaging components, according to the degree of complexity and market value of each type of material.

The results of the study indicated that about 8% of the materials were considered rejects and classified as non-recyclable for the cooperatives, especially those that presented:

» **A MIXTURE OF MATERIALS**: plastic tubes with aluminum, pouch type packaging composed by different resins (PET, PP and polyamide), besides make-up components consisting of plastic resins and organic compounds (wood, for instance);

» **DIFFICULTY TO SEPARATE** (disassemble): valves of various types

of materials, capping in glass perfume flasks, mirrors glued to make-up cases and lids with coupled aluminum and plastic;
» **COLORED MATERIALS**: plastic flasks, especially those in darker colors, besides painted glass flasks;
» **LACK OF IDENTIFICATION**: some plastic packaging presented very similar visual characteristics, and without appropriate identification they were confounded with others during the sorting stage.

The results showed that, in order to be considered "recyclable" by the cooperatives, the packaging materials above all had to be commercially viable, ie, be possible to sell to a recycler or to another purchaser.

Other points and difficulties were also raised by the cooperative members, such as price of commercialization that would make it worthwhile to sort the material compared to the volume of demand for commercialization.

The approach and relationship with the Cooperatives in this project enabled Natura to understand the importance and frailty of these organizations on the Brazilian recycling scene, since these professionals urgently need better working conditions and fair pay for the services that they provide to society.

With the National Policy of Solid Wastes (BRASIL, 2010), the work of the recyclable materials pickers more strongly promotes the reduction and recycling of the volume of solid wastes that are now mostly disposed of in landfills, and in the worst case in irregular garbage dumps.

This study helped Natura improve its understanding of the behavior of post-consumption wastes on the Brazilian disposal scene, and develop packaging based on *ecodesign* principles, promoting the use of recyclable and recycled materials among others, and to construct criteria for Natura's inventory of solid wastes.

NATURA'S SOLID WASTES INVENTORY

In order to meet the requirements and ambitions of Natura's Solid Wastes Program, in 2011 the Solid Wastes Inventory was conceived according to the life cycle perspective, covering not only the company's direct operations but broadening the scope to activities of their outsourced parties, distribution centers and disposal scenarios. This broader scope aims to create a greater awareness of the environmental impacts for decision making, directing resources management more efficiently for company sustainability.

The inventory was constructed through the definitions present in the current Brazilian legal requirements, especially those presented in the National Policy of Solid Wastes [PNRS] (BRASIL, 2010), but it also sought to apply principles that are part of the *Life Cycle Evaluation Methodology* (ABNT NBR ISO 14040:2009).

Thus a critical anlaysis was conducted, not only aiming to create a further methodological proposal for a solid wastes inventory, but mainly so that the model would be applicable and consistent to manage environmental impacts and for the corporate reality of Natura.

Three parts of material flow were defined for the inventory:

TOTAL WASTE: the sum total of all the waste generated by the activities directly or indirectly responsible for the production of the final products, and also the wastes from the distribution and use stages;

RECYCLED WASTE: the part of solid wastes that, after the stage in which they were used (consumption) are sent to recycling activities in different forms that may perform this function in the same product system, or in another subsystem;

REJECT: a part of the material that is finally disposed of in an environmentally adequate manner (BRASIL, 2010), ie, the flux of material that does not have any function in any product system.

Inspired by a model that was developed and implemented successfully for Greenhouse Gases, Natura's Solid Wastes Inventory was structured into three different levels, to generate subsidies for environmental decision making:

(i) NATURA INVENTORY: systemic approach involving the life cycle concept;

(ii) INVENTORY BY MACRO-PROCESS: involving the corporate actors resonsible for the wastes;

(iii) INVENTORY BY PRODUCT: individual detailing for each final product.

In general, there are two types of exit of the material flux from the representative model of the system of the product being studied, according to the subsystem to which it will be sent: Industrial Solid Wastes [ISW] generated by the industrial activities of the life cycle of Natura products and Urban Solid Wastes [USW] generated after the stage when packaging materials of the final products are used.

The Industrial Solid Wastes [ISW] data were collected from the actors directly involved (industries, warehouses and outsourced companies), and organized according to the definitions and classifications of the Brazilian Association of Tecnical Standards (ABNT NBR ISO 10.004:2004), related to the

different types of disposal presented by the PNRS (BRASIL, 2010) such as recycling, landfill and incineration, among others.

To analylze the Urban Solid Wastes [USW], the challenge was to determine the likelihood of Natura packaging, after fulfilling its function (use by the final consumer) being sent to some type of reuse and /or recycling.

Due to the great number of variables that lead the final product packaging to be treated (waste) or disposed of (reject), a final disposal model was constructed to include those who influence this decision, divided into four groups:

(A) TYPE OF PACKAGING: primary, secondary and transport;
(B) COMPOSITION MATERIAL: type, color and size;
(C) SCENARIO OF DISPOSAL: reverse logistics, municipal waste collection system and recycling systems.

FIGURE 1 illustrates the final treatment and disposal model of the packagings after they are used by the final consumer.

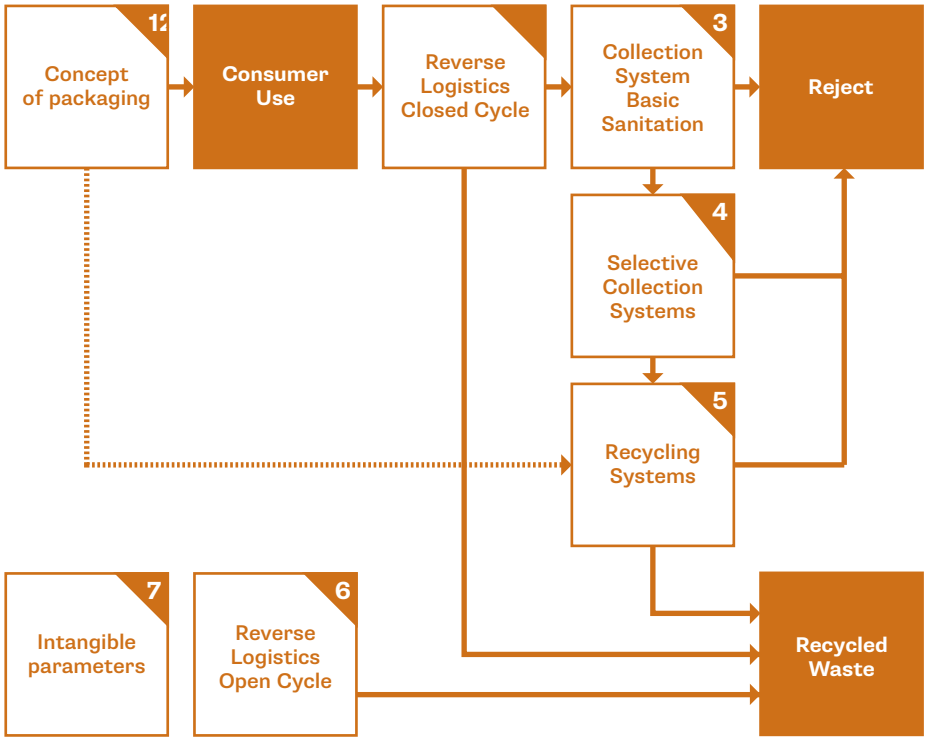

FIG. 1 Flowchart of the final treatment and disposal model. Source:

Since the analysis is conducted at the level of the final product, individually, it has a specific Recycling Factor ($0 \leq RF \leq 1$) which thus expresses its probability of really being reused in another subsystem, and, consequently, the fraction that will be disposed of in landfill as reject ($1 - RF$).

Finally, based on the number of units sold during the period of analysis, the probability of total recycled waste and total rejects is estimated, based on the treatment/disposal of total waste during the post-consumption stage.

The metrics of accountancy for the inventory was conceived to cover the positive and/or negative variations from the actions proposed by Natura regarding the aspect of "solid waste generation", as *ecodesign* and reverse logistics projects, packaging with a higher rate and/or probability of recycling and separation, and also environmental education practices, for instance.

The model proposed and its consequent application allow providing information that is dispersed throughout the value chain of the company and its products, consolidating them into a corporate operational inventory. This new tool is a central resource for the company to perform solid waste management, seeking increasingly sustainable choices in product design and development, and in the management of logistics chains and activities.

CASE STUDIES AND APPLICATIONS -TECHNICAL FEASIBILITY AND APPLICATIONS OF POST CONSUMPTION RECYCLED PLASTIC RESINS

The initiative studied the technical feasibility of post consumption recycled resins of High Density Polyethylene (HDPE) and Polypropylene (PP) in Natura packagings to reduce environmental impact by reducing the virgin raw materials and evaluating the production processes of the resins analyzed.

Based on the methodology proposed by the *GHG Protocol*, Natura performed an inventory of GHG (greenhouse gases) at the packaging recyclers and suppliers participating in the study, showing that recycled plastic resins have less impact on the environment than virgin resins. For PP resin the reduction was 34 to 41% and for HDPE the reduction was 37 to 44% compared to their respective virgin resin.

These studies show that it is possible to use post consumption PP and HDPE in a few Natura packagings safely and according to the current product

laws. On the other hand, the high amount of organic contaminants present in the potentially recyclable wastes directly influences the final quality of post-consumption resin, but it may be reduced by structuring a selective collection system.

-RELAUNCH OF NATURA'S EKOS BRAND

Outstanding among the changes that occurred in relaunching Natura's *Ekos* brand in 2011, are the increased use of post-consumption recycled material in the flasks produced using PET (primary packaging) and in the cartridges with carton paper) present in the secondary packaging of the final product.

In the years before it was relaunched, the PET resin of the flask consisted of 30% post consumption recycled material in only a single item of the line, and with this project the index became 50% in all PET flasks pertaining to the brand. In the cartridges, the amount of post-consumption recycled paper was less than 5% and increased to 40%. These actions contributed significantly to reducing the environmental impact, both in solid wastes and in the GHG emissions for the company.

One of the results of this project is the change in the esthetic characteristics of the packaging containing post-consumption recycled material. As to the PET flasks, the increase of the recycled percentage led to darker packaging compared to those manufactured from virgin material and to the flasks that used 30% of post-consumption. On the other hand, the carton paper became slightly darker, with a greater concentration of black points on the surface.

A major point of the tests performed is the direct influence of the quality of disposable waste on the quality of the recycled resin. In a country where selective collection practically does not exist, the quality of the recycled material resulting from this waste is very low, making it difficult to raise the post-consumption indexes in packaging with a specific esthetic appeal.

The importance of the role of companies in fostering the recycling market should be highlighted. Due to the low demand for this type of material, there are few investments in technology to improve the quality of the recycled input, and little is done about structuring more just and inclusive recycling chains.

-NEW NATURA LINE: SOU

Strengthening its commitment to sustainable development, Natura launched, the *SOU* line, a new sub brand which invites new consumption, with less waste, more pleasure and greater accessibility. In *SOU* sustainability goes beyond the environmental aspect, inviting each person to be a protagonist of change through their actions as a consumer, and in this way to take care of the future of the planet, at the same time as they fulfill their desires for personal care.

This new sub-brand was developed innovatively using the *ecodesign* principles, evaluating all stages of the product life cycle to allow choices regarding the essential, ie., offering high quality products with less environmental impact (KAZAZIAN, 2003). Seeking the inspiration for the packaging shape in the simplicity of natural solutions, the result was a drop, the most essential shape of a liquid. An original and exclusive packaging design was developed using the *"Stand Up Pouch"* technology.

In this way, the packaging is the same for all product categories (moisturizers, liquid soaps and hair), changing only the color: a single shape with the same materials simplifying the production process, storage and transport inside and outside the industry.

The design and production technology developed result in a packaging with 70% less plastic compared to the average market packagings, considerably reducing environmental impact (mean reduction of 60% in greenhouse gases emission, according to the Natura methodology based on the *GHG Protocol*.

-RECYCLING WORKSHOP

Seeking to increase internal awareness and commitment to the issue of wastes, in 2012 an original workshop was established dealing with recycling. The purpose of this training is to sensitize and incentivize the personnel to become agents of change on the subject of solid wastes inside and outside the company. Training is performed over two days: on the first day, activities are conducted at a Recyclable Materials Pickers' Cooperative where the participants have the opportunity of getting to know the work done by these professionals and participate in the activities of selecting and sorting post-consumption materials. On the second day activities involve actions and projects performed at Natura to promote understanding of the entire

production chain of wastes and the responsibility of each link in this context, contributing to make each participant think about their role as collaborator, citizen and agent of influence to improve the solid wastes scene in Brazil. So far more than 70 collaborators of the company have been trained.

According to the participants' evaluations in a written survey, the workshop was innovative and transforming, since it joined together theoretical content and practical experiences.

-DESIGN OF MONOMATERIAL PACKAGING

The studies conducted together with the recyclable materials pickers' cooperatives showed that one of the most relevant aspects that make the packaging recycling process difficult is the mixture of materials. For the waste market the economic viability of these materials is very low or does not exist, because they are difficult to take apart and they are not reused in the recycling processes.

Therefore, Natura conducted a study to improve the primary packaging of lipstick, currently made of components from several different materials. The challenge was to manage to develop a packaging from a single material (monomaterial), without compromising the esthetic aspects and the technical quality, also allowing an increase in the recycling rate on the Brazilian disposal scene.

The results showed that it was possible to develop a monomaterial lipstick packaging, replacing the current resins by those that are commonly commercialized by the cooperatives (such as PP and PE).

FINAL CONSIDERATIONS

While the issue of Solid Wastes is becoming increasingly important in Brazil for all interested parties, the implementation of the sustainable management of solid wastes for a company manufacturing consumer products presents several challenges, as shown by some managerial, educational and technical complementary initiatives in product and packaging design, developed by Natura.

The program adopted by the company as one of the priority topics on sustainability for the coming years, aiming at prevention, reduction and adequate management of wastes, promotes and incentivizes various innovative initiatives, with multiple partners in the chains, in synergy with other corporate commitments. In this sphere, the design of products, materials and recycling chains plays a long term role that is essential for the success of this initiative.

Over the short and medium term, the significant increase of the internal use of post-consumption recycled material for primary, secondary and tertiary packaging is considered a priority to leverage progress, because it promotes the development of recycling chains of essential materials (carton paper, main plastics, glass...), under adequate, traceable social, economic and environmental conditions. This is an essential step to build a sustainable scenario for solid wastes in Brazil.

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PUBLIC PROCUREMENT AND SUSTAINABILITY: AN ANALYSIS ON THIS MATTER IN THE BRAZILIAN FEDERAL GOVERNMENT

TERESA VILLAC
SYLMARA LOPES FRANCELINO GONÇALVES-DIAS

The present chapter seeks to analyze sustainable public procurement in the Brazilian federal government, specifically examining its current stage, identifying barriers and possible solutions to be implemented. In this way, the regulatory frameworks in the context of sustainable public procurements are presented jointly from the legal and management perspectives in order to have an interdisciplinary debate. It should be highlighted that this work is not aimed at exausting the topics presented, which are recent in Brazil and whose contours, concepts and lines of action are still under construction.

From a critical perspective, the study intends to answer the following question: how Brazilian government procurement has the potential to contribute to strengthening relations between sustainability and public contracts. For this purpose, analysis is performed from two perspectives:

(A) Of the social actor State, as a sustainable consumer of goods and as an inducer of new markets, and,

(B) Of bidding as a tool, considered as an economic instrument to implement public policies.

The State's approach begins with an internal and organizational analysis, considered as an institution that, within the Brazilian legal sphere, is called Public Administration. Among all the State entities (Union, States

and Municipalities), the study is circumscribed to federal public administration, because the Brazilian federal contracts annually have a considerable turnover with a percentage of 15% of the Gross Domestic Product (MP, 2012).

In turn, bidding is approached beyond an exclusively legal analysis, placing it in context as an economic instrument that is related to the public policies undertaken by the State, and public and private environmental management mechanisms. Among the possibilities for bidding, the thematic section is in procurement, in order to be able to analyze a few of the problems referring to the supply chain, one of the crucial elements when one sees the insertion of sustainability into State consumption, because it involves several social actors in this scenario (industry, suppliers, Public Administration and pickers of recyclable materials).

In this way, the chapter contributes to debating a topic that is still incipient in Brazilian literature, indicating guidelines for future studies and, perhaps, in the process of implementation of the public policy of Brazilian sustainable public procurement.

STATE, PUBLIC PROCUREMENT AND SUSTAINABILITY

The currently used concept of State is circumscribed to the subject responsible for exercising the administrative functions, constitutionally called Public Administration:

> in a subjective, formal or organic sense, it (Public Administration) designates the entities that carry out administrative activities; it comprises businesses, public organs and agents, tasked with exercising on of the three functions into which State activity is divided: the administrative function. (DI PIETRO, 2008, P. 49)

One of the characteristics of Brazilian Public Administration is the necessary connection and observance of the principles of the Constitution: legality, morality, impersonality, reasonability, publicity, efficiency, legal safety, motivation, right to defense, the adversarial system and the supremacy of public interest. From the perspective of management, Matias-Pereira (2009) points to a crisis scenario of Brazilian public bureaucracy, with seven dimensions:

(A) DEFICIENCY IN STRATEGY (focus and convergence of programs and actions).

(B) FRAGILE STRUCTURE (slow, excessive in some sectors, scarce in others).
(C) Dysfunctions in the processes (subject to highly bureaucratic standardized rules).
(D) LACK OF TRAINING of the employees, with many distortions from lack of distribution, qualification and remuneration of the resources that are inadequate, ranging from the logistic ones and facilities to information technology, although there are areas of excellence.
(E) CULTURAL PROBLEM (excessively bureaucratic and permeable to patrimonialist practices).
(F) LACK OF A CONSOLIDATED MODEL of public bureaucracy. Patrimonialist State present in the Brazilian political culture. This dysfunction is present in the clientelism, corporativism, physiologisms and corruption existing in the country.

Fonseca (2013) says that international literature discusses the role of the State as a purchaser, from a perspective of sustainability, citing references such as Preuss (2009); Walker and Brammer (2009); Brammer and Walker (2011). As regards the adoption of management mechanisms to implement sustainable public procurement, we can mention: Comprar Ecológico! Manual de contratos públicos ecológicos da European Commission (UNIÃO EUROPEIA, 2011), (Buying Ecologically! Handbook of ecological public contracts of the European Commission (EUROPEAN UNION, 2011). prepared for public administrators, which values specifically the use of state procurement power to reduce environmental impacts and prevent waste:

> *The public authorities are among the great European consumers, spending about 2 billion Euros a year (the equivalent to 19% of the GDP of the EU). When using their purchasing power to choose goods, services and works with a reduced environmental impact, they can provide a major contribution to the sustainability objectives at the local, regional, national and international levels.* (EUROPEAN UNION, 2011, P. 5)

In the United Kingdom, the policy of sustainable public contracts is developed by the Department for Environment Food and Rural Affairs – DEFRA and one of its goals is to have departments and government agencies exercise leadership in sustainable procurement, associating policies with obtaining greater efficiency "value for Money", and reaching a better cost-benefit – that will take sustainability into account – for the taxpayers. A tendency is observed

to broaden the concept of efficiency, beginning to insert other variables into its composition, such as environmental and social impacts (DEFRA, 2011).

In this sense, it must not be forgotten that every product manufactured, transported, used and discarded within the supply chain provokes an environmental impact. This impact is a function of the material and energy consumed, and of the wastes discharged throughout the product life cycle which, in turn, depends on the type of product and the technology used (TSOULFAS; PAPPIS, 2006). Thus, it is important for the State also to examine the life cycle of the product to check and gain a better understanding of the impacts of the goods to be procured.

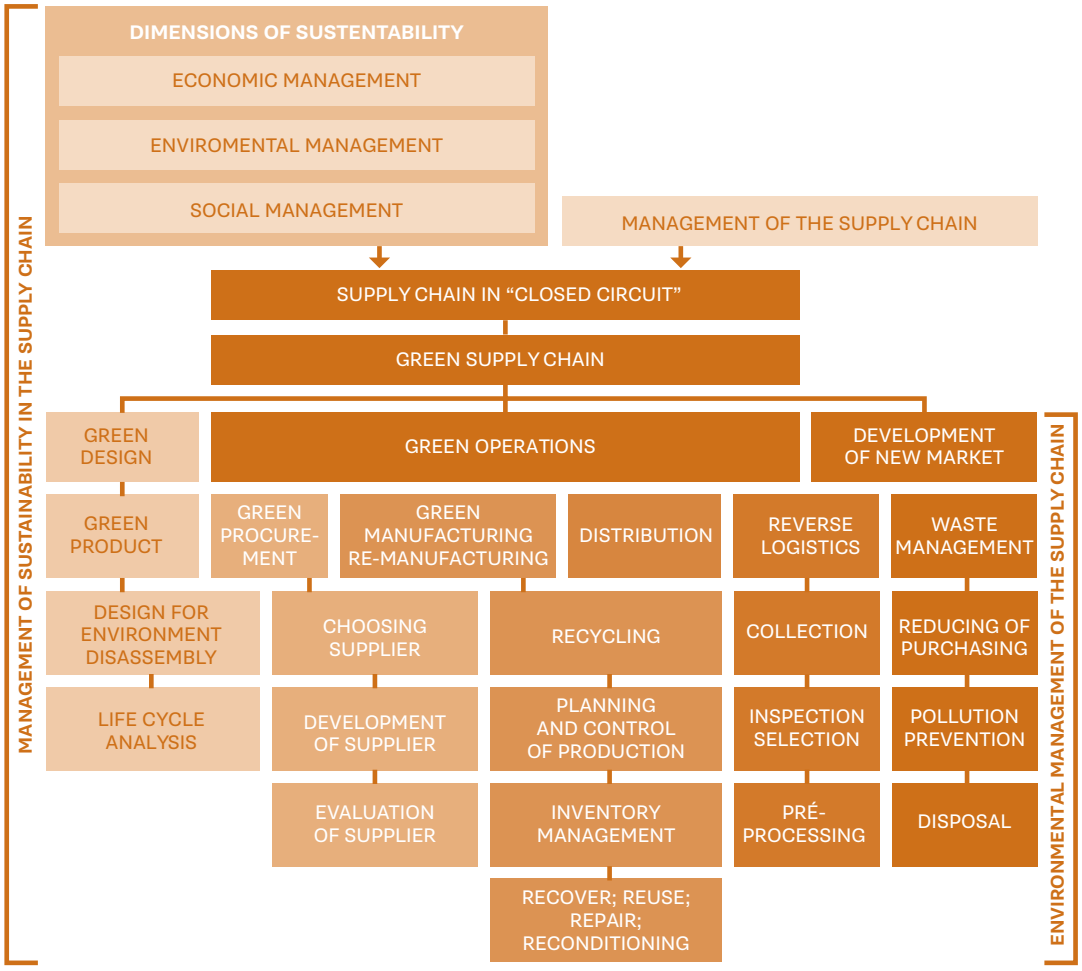

FIG. 1 Classificaton of the topics involved in the study of GSCS. Sources: created by the beginning with Srivastava(2007), Vurro, Russo and Penini (2009). Fonte: Gonçalves-Dias, S. L. F. et al. (2012)

In the literature on administration, one can find the term green procurement or environmental procurement, as synonymous with sustainable purchasing (LABEGALINI, 2010). Carter and Carter (1998) define green procurement as the involvement of the strategy of purchases in activities that include reduction, recycling, reuse and substitution of materials. For an organization, individually, Zsidisin and Siferd (2001) complement the definition of green procurement as a set of lasting procurement policies, actions taken and relations formed in response to the concerns associated with the environment. For these authors such concerns are related to the acquisition of raw materials, including input, distribution and output operations, from packaging, recycling processes, reuse, reduction of resources to final disposal after consumption. In this sense, green procurement should beging during the design phase and continue throughout until the final disposal of the product (ZSIDISIN & SIFERD, 2001). Therefore, implementing the concept of sustainable public procurement will involve definitions of strategies and actions of selection, evaluation and development of suppliers, as seen in **FIGURE 1.**

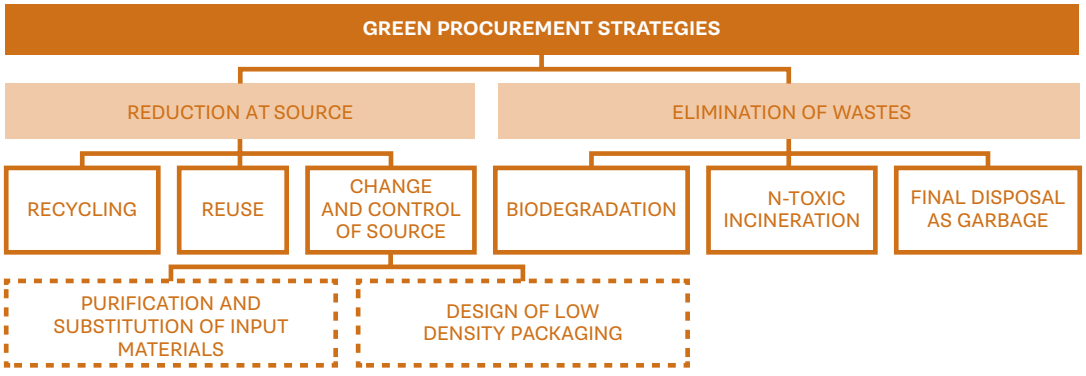

FIGURE 2: Green procurement strategies. Source: Labegalini, 2010, P. 54)

PROCEDURE AND METHOD

This is an exploratory study on sustainable public procurement in the Brazilian Federal government, based on secondary data. The seven dimensions of Matias-Pereira (2009) are used in this study as categories of analysis to identify the difficulties in implementing the public policy, from the perspective of the State and of the instrument used (bidding), analyzing the scenario of sustainable

federal procurement, both from the point of view of management and of law. The State's approach begins with an internal and organizational analysis, considered as an institution that, within the Brazilian legal sphere is called Public Administration. Among all the State agencies (Union, states and municipalities), the study is circumscribed to federal public administration.

- THE CASE STUDIED: SUSTAINABLE PUBLIC PROCUREMENT IN THE BRAZILIAN FEDERAL GOVERNMENT

The Brazilian Federal Government, in this study considered from a strict perspective as the federal executive power, has initiatives concerning sustainable public contracts developed both by the Ministry of the Environment (*MMA-Ministério do Meio Ambiente*), through the sector of Socioenvironmental Responsibility, and by the Ministry of Planning, Budget and Management [*MPOG – Ministério do Planejamento, Orçamento e Gestão*], through the Office of Logistics and Information Technology. Without neglecting the fact that there are initiatives in other ministries and federal agencies of the executive power, the study focuses on the actions of the MMA and MPOG, because of their institutional functions which are related to the development of public policies on sustainability and public contracts:

> **(A) MINISTRY OF THE ENVIRONMENT**: to promote the adoption of principles and strategies for knowledge, protection and recovery of the environment, sustainable use of the natural resources, insertion of sustainable development into the formulation and implementation of a public policy, in transversally and shared, participatory and democratic form at all levels and instances of government and society.[1]
>
> **(B) MINISTRY OF PLANNING, BUDGET AND MANAGEMENT**: participation in formulating the national strategic planning; evaluation of the socioeconomic impacts of the policies and programs of the Federal Government; elaboration of special studies to reformulate policies; coordination and management of the administration systems for information and informa-tics resources and general services, as well

[1] *http://www.mma.gov.br/o-ministerio/apresentacao*

as actions for organization and administrative modernization of the Federal Government, with policies and guidelines to modernize federal public administration.[2]

-SUSTAINABLE PROCUREMENT IN THE MINISTRY OF THE ENVIRONMENT

In the Ministry of the Environment, the Office of Institutional Articulation and Environmental Citizenship develops actions in sustainable bidding, through the Program of the Environmental Agenda in Public Administration, which is being articulated from the perspective of environmental management with initiatives for the rational use of resources, adequate management of wastes, quality of life in the work environment, sensitization and capacity buiding for government employees.

In its turn, the Action Plan for Sustainable Production and Consumption [*PPCS- Plano de Ação para Produção e Consumo Sustentáveis*], through the Department of Sustainable Production and Consumption, was developed based on the formal adhesion of Brazil to the Marrakesh Task Force, and the commit-ment of the country to adopting a corresponding national action plan for sustainable production and consumption. The actions are both in the public and private sector, involving various stakeholders, such as federal, state and local agencies, the production sector, financial institutions and consumers, besides other social actors, such as class entities, non-governmental organizations, academic and scientific communities, multilateral agencies and agencies for international cooperation and international community (MMA, 2011).

-SUSTAINABLE PROCUREMENT IN THE MINISTRY OF PLANNING, BUDGET AND MANAGEMENT.

The initiatives of the Ministry of Planning, Budget and Management were taken through the Office of Logistics and Information Technology [*SLTI Secretaria de*

[2] *http://www.planejamento.gov.br/editoria.asp?p=editoria&index=62&ler=s666*

Logística e Tecnologia da Informação] which holds the competency to propose policies, plan, coordinate, supervise and guide activities normatively: administration of the information and computer resources, that comprise the technological infrastructure supporting the information cycle; general services, comprising the activities of administration of materials, transport, communications, administrative communications and documentation services, as well as electronic government activities involving the availability of electronic services and good practice among others (Decree 7,.675/2012).

In January 2010, Normative Instruction n. -1, SLTI-MPOG was instituted, about the insertion of sustainability criteria into the government hiring of services, works, and acquisitions, without any perspective concerning operational management. As regards public procurements, the rules were not made mandatory. Outstanding among them is:

(A) That the goods be constituted in all or in part by recycled, atoxic, biodegradable material, according to ABNT NBR – 15448-1 and 15448-2;
(B) That the environmental requirements be followed to obtain the certification of the National Institute of Metrology, Normalization and Industrial Quality (INMETRO - Instituto Nacional de Metrologia, Normalização e Qualidade Industrial) as sustainable products or with less environmental impact compared to similar products;
(C) That the goods must be, preferably placed in appropriate individual packaging, with the smallest volume possible, that will use recyclable materials, so as to ensure maximum protection during transport and storage; and
(D) That the goods do not contain hazardous substances at concentrations above that recommended in the RoHS (Restriction of Certain Hazardous Substances) directive, such as mercury (Hg), lead (Pb), hexavalent chromium (Cr(VI)), cadmium (Cd), biphenyl-polybromates (PBBs), diphenyl polybromates (PBDEs).

The present study has two sources of evidence: secondary data and physical artifacts. and, regarding the former, it was founded on documental analysis, consultation to public information available on government sites; regulatory frameworks in the national sphere, specialized literature on sustainable bidding, public administration and policies.

As to the physical artifacts, the main Brazilian initiatives for socioenvironmental public administrations that explicitly discuss or relate to the object of research were surveyed, highlighting the Environmental Agenda Programs in Public Administration [*Programas Agenda Ambiental na Administração*

Pública – A3P] and Sustainable Production and Consumption Program [*Programa de Produção e Consumo Sustentável*], both from the Ministry of the Environment; Selective, Solidary Collection in Federal Public administration. Plan of Sustainable Logistics and Catalogue of Sustainable Materials, these of the Ministry of Planning. A critical analysis of these initiatives was adopted based on the evaluation of reports and other physical evidence.

The period of analysis is from January 2010 to December 2012. The initial time period looks at the first federal normative framework on sustainable bidding, substantiated in the Normative Instruction of the Ministry of Planning (IN 1, January 2010) and the month of December 2012 was defined because it enabled the analysis of annual databases made available by the same Ministry as regards federal sustainable public contracts.

In order to accomplish the aims of this chapter, the analysis of sutainable public procurement in the Brazilian Federal Government was performed on three axes:

(i) The State as consumer and the use of its procurement power;
(ii) Bidding as an instrument to implement public policies;
(iii) Regulatory frameworks that relate the sustainable public procurement jointly from the legal and administrative perspectives.

- THE STATE AS A CONSUMER AND THE USE OF ITS PROCUREMENT POWER-

From a perspective towards sustainability, it appears to us that the role of the State as a consumer goes beyond measuring costs that can be monetarized and innovation in the procurement processes, and covers a systematic view of contracting to be more broadly contextualized, taking sustainability into account throughout the supply chain.

Indeed, the relationship between public contracts and sustainability is recent in Brazil, and there are as yet few studies on the topic. It was highlighted on the national scene from December 2010 onwards, with changes in the Law of Bidding (Law 8,666 of 1993) according to which the purpose of bidding is to promote sustaianble national development (Law 12,349). The national impulse is also due to the initiative of the Ministry of Planning, Budget and Management, which published a Normative Instruction that is applicable to all direct and indirect federal public administration agencies.

It is very important that the management of the reverse flows (GONÇALVES-DIAS, ET AL., 2012) also be considered in Brazilian government contracts, which does not occur nowadays. In this item it can be underscored that the deficiency of strategy and dysfunction in processes prevail, as discussed by Matias-Pereira (2009), especially if one considers that it is the duty of the State to protect the environment, and that there are public policies that deal with solidary selective collection in public administration (Decree Decreto 5,940, of 2006) and the management of solid wastes (Law 10,305, of 2010).

Here we also find the first barrier to the implementation of major strategies to strengthen the State as a consumer and developer of new markets, with goods that have less impact on the environment. This is the difficulty of inserting, into public administration, a view that will consider greater organicity in the government structure through articulated, concatenated and interrelated actions in the different internal administrative sectors of a same public agency, and also the lack of connectivity between public policies.

This barrier has already been identified by a Brazili comptrolling agency, the Federal Audic Court (Tribunal de Contas da União), which, in a judgment of its Plenary, resulting from an operational audit (AC 1752, of 2011), underscored that:

> *[...] the absence of a clear direction from the Central Government that will demand sustainability actions with a rational use of natural resources by the public administrators impairs the outreach of positive results that could come from these practices. With this the actions ultimately depend on isolated and sporadic measures of each administrator. In addition, the existing programs, projects or initiatives that aim at promoting measures of sustainability and efficiency in the sphere of Federal Public Administration, encounter difficulties for their broad dissemination, besides representing the possibility of dispersing public funds because of superposed initiatives.*
>
> It was recommended to the Ministry of Planning that:.
> *a plan aiming at guiding and incentivizing all agencies and entities of the Federal Public Administration to adopt measures to increase sustainability and efficiency in using natural resources, especially electricity, water and paper, considering the country's adhesion to international agreementd\; Agenda 21, Framework Convention of the United National on Climate Change and Marrakesh Process [...]*

Implementing a public policy of sustainable government procurement focusing on the management of the supply chain pressuposes, at least, the

possibility of articulating the public policies on management of solid wastes, climate changes and and sustainable bidding,. besides mechanisms for the development and innovation of the market, be it by incentives, or by exemptions or legally establishing criteria of preference in bidding. Among the Matias-Pereira (2009) dimensions previously mentioned, are the cultural issues, deficiencies in strategy and dysfunction in the process which, at this point present as barriers to Brazilian Federal sustainable public procurement, as shown in **SUMMARY TABLE 1.**

Barriers	**Category of analysis according to Matias-Pereira** (2009)	**Soluções possíveis a serem implementadas**
Lack of articulated, concatenated, and interrelated actions in the different administrative sectors of a same government agency.	» Cultural issue » Strategy deficiency » Dysfunction in the process	» Institutionalization of routines that enable understanding sustainability in all departments of the public agency. » Training the government employees. » Sustainable public procurement as an environmental management mechanism (5RS).
Lack of connectivity among public policies.	» Cultural issue » Strategy Deficiency » Dysfunction in the process	» Systemic view of public policies. » Articulation between plans and government actions.
Non consideration of the management of reverse flows in sustainable public procurement	» Strategy Deficiency » Dysfunction in the process	» Systemic view of public policies. » Articulation between government plans and actions.

TABLE 1 Barriers to the Brazilian State being classified as a responsible consumer.
Source: Research Data.

In order to effectively develop the responsibility of the State in preserving the environment through sustainable consumption, it is important to consider the formulation of this public policy, of the 5 Rs of environmental public management: reduce, rethink, reuse, recycle and refuse to consume products that have significant socioenvironmental impacts.

This is the integrated concept of the use of the State procurement power by means of sustainable bidding with other initiatives of environmental management, such as the rational use of resources, adequate management of wastes, sensitization and training of public employees and the quality of life in the working environment.

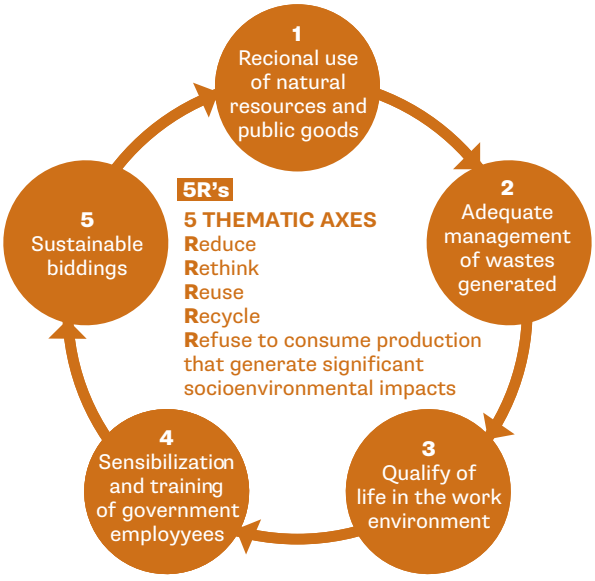

FIG. 3 The 5Rs and the five thematic axes of the Environmental Agenda in Public Administration.. Source: Ministry of the Enviornment (s/d), 2012.

Sustainable public procurement as a mechanism for environmental management is part of the pespective of a dynamic and non depleting life cycle that does not end when a product is procured. It comprises the institutionalization of routines that enable understanding sustainability in procurement, ranging from the phase of government planning of the procurement, continuing with its insertion with legal safety into the official notices and contracts, follow up and monitoring of the rational use of the good acquired and ending with the appropriate environmental management of the rejects and wastes resulting from contracting (recyclables, non recyclables, health wastes, for instance).

BIDDING AS AN INTRUMENT FOR THE IMPLEMENTATION OF PUBLIC POLICIES

Bidding is the constitutional principle, substantiated in an administrative procedure before a contract is made for services, works, acquisitions, selling off, con-

cessions, permissions and rentals, to which Public Administration is subjected.

The rules for bidding are in Law 8,666, of 1993, and these should obey the principles of isonomy, legality, impersonality, morality, equality, publicity, administrative probity, abidance by the call for bids, objective judgement and other correlated principles. The immediate purpose of a bid is to obtain the means necessary for the organs of Public Administgration to exercise their institutional purposes, obtaining the instruments, including the goods, which enable them to function regularly.

Considering the supremacy of the public interest that guides administrative law, biddings, from the perspective of primary public interest, bidding has purposes that are explicitly spelle out in Law 8,666/93 :

(A) Obeying isonomy,

(B) Obtaining the most advantageous proposal for the Administration, and

(C) Promoting sustainable national development.

Obtaining the most advantageous proposal involves serving the public interest, and it is forbidden to insert unnecessary or inappropriate clauses that restrict the competitive character. In this regard, as to the relationship between advantageousness and economicity, the search for economicity cannot result in damage to the public interest, with contract sthat are inefficient in environment or administrative terms.

Thus, through a legislative change that occurred in 2010 (Law 12,349), promotion of sustainable national development became a goal to be achieved in the Brazilian tenders in all spheres: federal, state, municipal and district (Executive, Legisltive and Judiciary) and is applicable both to organs of the direct and indirect public administration.

The change of paradigm is significant and here the regulatory function of tenders is inserted, whose foundation lies in the constitutional duty of the State to preserve the environment. Biddings also has the function of social regulation (BARCESSAT, 2011) and can be undertaken by the State to foster certain public policies. Thus, there is a main purpose of the bidding, that is not completely depleted by the end of the contracting, which is to fulfill the collective good, pursue human rights and constitutional principles.

The challenge lies in rendering operational a new purpose of the tenders, ie, promoting sustainable national development. In fact, from the perspective of sustainable public procurement, it should not be forgotten that every product manufactured, transported, used and discarded within the supply chain, causes an environmental impact. This impact is a function of the material and energy consumed, and of the waste discharged throughout

the life cycle of the product, which in turn depends on the type of product and the technology used (TSOULFAS; PAPPIS, 2006).

In acquisitions, it is important for the State to look at the product life cycle to check and gain a better understanding of the resulting impacts. However, public procurement has its own rules which are not very flexible and which are in the Law of Biddings (Law 8,666, of 1993) and, as regards common assets, the purchase should be made through a downbidding auction, in which the criterion of judgment is the lowest price (Law 10,520 of 2002). Here one identifies another barrier, dysfunction in the process (MATIAS-PEREIRA, 2009), which was overcome with the development of interpretive processes that provided a foundation, with legal security, for government acquisitions that can be sustained through the modality of bidding called pregão, downbidding.

In this sense, sustainable public procurement is done through the administratively motivated choice of a good with technical specifications that cause less environmental impact. When subsidizing this process of choice by the public administrator, the Ministry of Planning provides a Catalogue of Sustainable Materials (Sustainable CATMAT), whith 797 items.

The Office of Logistics and Information Technology [*Secretaria de Logística e Tecnologia da Informação*] is responsible for the development of the Material Cataloguing System [*CATMAT-Sistema de Catalogação de Material*] for the purpose of standardizing the specifications of goods acquired by the federal public administration.

CATMAT is computerized, focusing on the public procurement of goods for common use, carried out by downbidding, preferentially electronic, at a specific site on internat, the Portal of Electronic Procurement of the Federal Government [*Portal de Compras Eletrônicas do Governo Federal*] Comprasnet (*www.comprasnet.planejamento.gov.br*), which also includes the Catalogue of Materials. A look at the system shows that Comprasnet can be considered an instrument for operational management, which allows the automation of processes, enabling faster bidding, increasing the list of competitors, who do not need to be present at the time the proposals are judged, and it increases the efficiency of the government procurement processes (BRAGA ET AL., 2008). If the good one intends to acquire contains a specification, this can be added by the government employee to the corresponding official notice. If not, it is possible to request the inclusion of a new item.

It is simple to use Sustainable Materials Catalogue and it does not present much difficulty for access and operation by government employees. However, it should be mentioned that there are no consequences in the system for the cases in which a sustainable ´product is not chosen. It is also observed that

there is an initial binary question in which the government employee chooses (or not) to access the Sustainable Catalogue. The daily repetition of this routine by the employees involved in tenders may trigger a perception in which a sustainable procurement is limited to the choice of a good that is in the "Sustainable" CATMAT Catlogue, ignoring other aspects of administration involved, such as the rational use and the disposal of wastes. A new barrier to sustainable public procurement is found, classified as dysfunction in the process. A possible way to overcome it is to conjugate the system with other socioenvironmental management mechanisms..

Among the possibilities of public contracts (procurement, works or services), the part studied was public procurement, considering the significant growth that the acquisition of "sustainable" goods has undergone in the federal government. According to the data from MPOG [4], in 2012 there was a 236% increase in the procurement of "sustainable" items, based on the year 2010. Between 2010 and 2012, the number of suppliers who participated in sustainable bidding grew 10%.

As regards the economic impact of sustainable public procurements undertaken by the Brazilian Federal Government during 2012, the percentages of sustainable procurements are tiny, equivalent to only 0.1% of the total of federal government acquisitons during 2012.

According to the information written in the report *"Informações Gerenciais de Contratações Públicas Sustentáveis"* (Managerial Information on Sustainable Public Contracts) January-December 2012 - SLTI, there were a total of approximately R$ 40 millions of the total of R$72,6 billions spent, ie., only 1,481 procurement proceedings, considering the total of 231.8 thousand proceedings carried out (MPOG, 2012C), as shown in **TABLE 1.**

Public procurements	**2010** (%)	**2011** (%)	**2012** (%)
"Sustainable"	0,03	0,04	0,10
"Non sustainable"	99,97	99,96	99,90

TABLE 1 Participation of the value of sustainable public procurements out of the total of procurements by the Brazilian government. Source: Comprasnet. Secretaria de Logística e Tecnologia da Informação. MPOG (2012, c).

However, it should be considered that these data refer to the use of the "sustainable" items that are in the Catalogue of Materials [*CATMAT*] and one can not rule out the possibility that within the 99.9% of bids classified as "non-sustainable" there may have been the acquisition of goods with sustainable

[4] Management information of Sustainable Procurement, January-December 2012.

specifications that are not in the Sustainable CATMAT, configuring the barrier of the lack of a consolidated model of bureaucracy. From this perspective, the data in table 1 may not correspond to the reality of sustainable public procurements by the Brazilian Federal Govenrment, and it is recommended that other criteria be established to analyze the percentage of sustainable contracts, that are not limited to the adoption or not of the Sustainable CATMAT.

Another difficulty identified is the that when the govenment employees write the official notice about the technical aspects of sustainable goods, they do not know these aspects, and this is configured as a dysfunction in the process, to be overcome with a systemic view of the public policies and the articulation between government plans and actions. There are also contrary opinions by the Audit Courts, concerning the admissibility of requiring environmental certifications in public procurements and the matter demands further thought. This barrier (dysfunction of the process) can be overcome with: a public policy that will implement public environmental certifications that do not restrict competitiveness, or an option to adopt sustainability criteria to replace certifications, or joining together both hypotheses.

Examining the value of the procurement of sustainable goods most purchased by federal public agencies, during 2012 (MPOG, 2012B), we find:

(A) R$13,600,000.00 refer to computer equipment, the so called Green IT, which is the subject of technical specifications presented in details in the Administrative Ruling (Portaria) of the Ministry of Planning and Management ((Portaria n. 01/2010, SLTI).

(B) R$8,900,000.00 are air conditioning equipment, without details, and it is possible that this may involve the use of the Selo Procel (Procel Stamp) as per a consultation to the Sustainable Catmat.

(C) R$7,700,000.00 were spent on A4 paper, without details as to type (non-chlorinated or recyclable).

(D) R$1,550,000.00 on detergent, and this type of product must mandatorily be registered at the National Agency of Sanitary Surveillance (Agência Nacional de Vigilância Sanitária).

(E) R$7,800,000.00 refer to sustainable goods without a precise specification.

Another barrier is the absence of a legal conceptualization expresssed about sustainable bidding, a difficulty that does not fit the categories of analysis of Matias-Pereira (2009) and that, for the purposes of this study, we will call airtight interpretive processes, to be overcome with legal hermeneutics that

will bring together the principles of environmental law in bidding and greater connectivity between environmental law and administrative law (bidding).

In a legal approach, it is found that the conceptualization of sustainable public purchasing is being formed in Brazil, and its fundamentals can be extracted from various international commitments. There are concepts in the international literature, such as the study by Walker and Phillips (2006), with a review of the literature on sustainable public contracts. However, in this study it was chosen to present concepts extracted from International Statements that were signed and acknowledged by Brazil.

In this sense, the Rio Declaration (1992) established that the States must reduce and eliminate the unsustainable production and consumption standards (Principle 8), while Global Agenda 21, which is more specific for public procurement, foresaw the development of policies and strategies by the countries to stimulate changes in the unsustainable consumption patterns "through acquisiions by governments" (item 4.22 d). foreseen that these should "examine the acquisition policies of their agencies and departmetns, so as improve, whenever possible, the ecological aspect of their acquisition policies " (Item 4.23).

In the legal field, there is an outstanding concept of sustainable bidding from a known author of doctrine in the field.:

All things considered, it is useful to offer the concept of bidding guided by the constitutional principle of sustainability: it is those that, with isonomy and the effective seeking of sustainable development, aim at selecting the most advantageous proposal for Public Administration, having weighted, with the maximum objectivity possible, the social, economic and environmental costs and benefits. *(FREITAS, 2011)*

> Or also, sustainable public contracts [*SPC*]
> *[...] they mean the preference to be given in bidding processes to the socially correct products, with less environmental impact, whose production process will incorporate socioenvironmentally sustainable standards. This is the acquisition of goods and materials that generate a smaller environmental impact in their life cycle.. Aspects such as the greater or lessser environmental impact resulting from the production process, as well as risks to the environment and to human health as a consequence of the use and/or discarding, can and should be evaluted when a product or service is acquired by the public organization.*
> *And, it should be underscored, not only environmental, but also social aspects, such as using slave or child labor in their production.*
> (FERREIRA, 2012, P. 85).

Already from a perspective more closely related to a view of the supply chain, coming from management of operations, the Implementation Plan of the Declaration of Johannesburg (2002) discussed the promotion of "policies of public procurement that will encourage the development and diffusion of goods and service that are rational from the environmental viewpoint" (Chapter III 18 c). This is related to the analysis of the life cycle, and an advance occurred in the concept of sustainable procurement, already from the perspective of environmental management. Continuing, the Marrakech Task Force on Sustainable Public Procurement is highlighted, which developed tools to implement the sustainable public contracts on a world scale. In the corresponding report, (UNEP, 2011) we find the insertion of operational management mechanisms are inserted in purchasing, according on the insertion of operations management mechanisms in procurement as in **FIGURE 4**.

FIG. 4 The sustainable public procurement process. Source: UNEP, 2011.

The report presents the concept that
the sustainable contracts are a process, in which the organizagtions meet their needs for products, services, works and public services in a way that attains a good cost-benefit relation on a long term base, in terms of generation of benefits, not only to the organization, but also for society and the economy,, while minimizing the damage to the environment. (UNEP, 2011, P. 6)

It is found that the concept of sustainable public contract presented in the report is broad, inserting it into a resource management process, clearly showing the relationship with the suppliers and their management. Thus, sustainability is not only concentrated on the end product, but on all of the life cycle of the product, from extraction and production to transport, reuse, recycling or disposal, according to the proposals by Zsidisin and Siferd (2001).

Internationally, in the Marrakech Task Force, the concept used by the United Kingdom was adopted, and in this sense it is important to show the context that there the government actions in sustainable public contracts are developed from a management perspective and have a broad action plan that considers the different links of the production chain, as can be seen fromt he following objectives:

(A) to improrve sustainability in the Government supply base.
(B) to develop new tools and government solutions that will provide greater efficiency and advantage to the government and the other sectors,
(C) to identify the high carbon impacts on the government supply chain, and
(D) to develop suppliers for the more sustainable products (DEFRA, 2011).

As previously mentioned, there is no legal concept of sustainable public contract in Brazil and the topic has been discussed in publications, but no concept was necessarily introduced. .Outsanding gn among the publications, within the scope of Administration, is the concept mentioned in the first Brazilian book on the topic, by ICLEI and the Center of Studies of Sustainablity of FGV-EAESP:

> *Sustainable bidding is a solution to integrate environmental and social considerations into all stages of the procurement and contracting of the public agents (government agents) for the purpose of reducing impacts on human health, on the environment and on human rights. Sustainable bidding allows meeting the specific needs of the end consumers through the procurement of the product that offers the greatest number of benefits to the environment and to society. Sustainable bidding is also known as 'sustainable public procurement', 'ecoacquisition', 'green procurement', 'environmentally friendly procurement' and 'positive bidding'.* (TENDERERMAN ET AL., 2008, P. 25)

Beginning with the constant concept of the Marrakech Task Force on Sustainable Public Procurement (UNEP, 2011), sustainable public procurements from the perspective of management should consider socioenvironmental criteria in the production, consumption and final disposal of the goods, understood as an integrated process that does not end when the procurement

of a sustainable good is chosen, but that is related to the insertion of environmental standards into the official notices, the rational use of the goods by the government employees and the appropriate environmental disposal of the wastes and rejects resulting from the acquisition.

In fact, sustainable public procurement has a necesary relationship with the production sectors and with waste management mechanisms, and, in further debate, a few important topics arise, such as analysis of the life cycle, environmental certifications, establishing margins of preference, fostering certain productive sectors and tributary exemptions, as seen in **FIGURE 5**.

It is also perceived that even thought the ultimate aim of the State is different from the entrepreneurial sector and the rules for government purchases are strictly normatized,, there are similarities between the implementation of sustainable consumption actions in both spheres, the implementation of sustainable consumption actions in both spheres (public and private), such as seeking the reduction of impacts that will be harmful to the environment, and the importance of life cycle analysis, and, besides, the State as a consumer is the final addressee, precisely, of the sustainable products developed by private enterprise. In relations between the State and companies, there are initiatives that can be adopted jointly (as campaigns to make the population at large sensitive to the environment) and others that are the responsibility of Government, such as regulatory and fiscal policies.

In this context, it is possible to conceptualize a sustainable procurement that will apply both to the public and the private sectors, as presented by Betiol et al. (2012), who discussed the public and entrepreneurial sustainable consumption:

The power of consumption of the entrepreneurial and government sectors is strategic to conquer a new ecosocioeconomic level. Despite the barriers, which are natural when one touches on habits that are already rooted in management, slowly society understands the existing connections between what we buy and conserving the resources of the planet to supply current and future needs, within fair and equitable standards. In this scenario, the concept of 'sustainable procurement' is multiplied.: those that consider social and environmental factors together with financial ones, in making decisions about procurement. (BETIOL ET AL., 2012)

The systematization of barriers to sustainable public procurement from the perspective of bidding as an instrument to implement public policy, substantiated in the promotion of sustainable national development is presented in Summary **TABLE 2**.

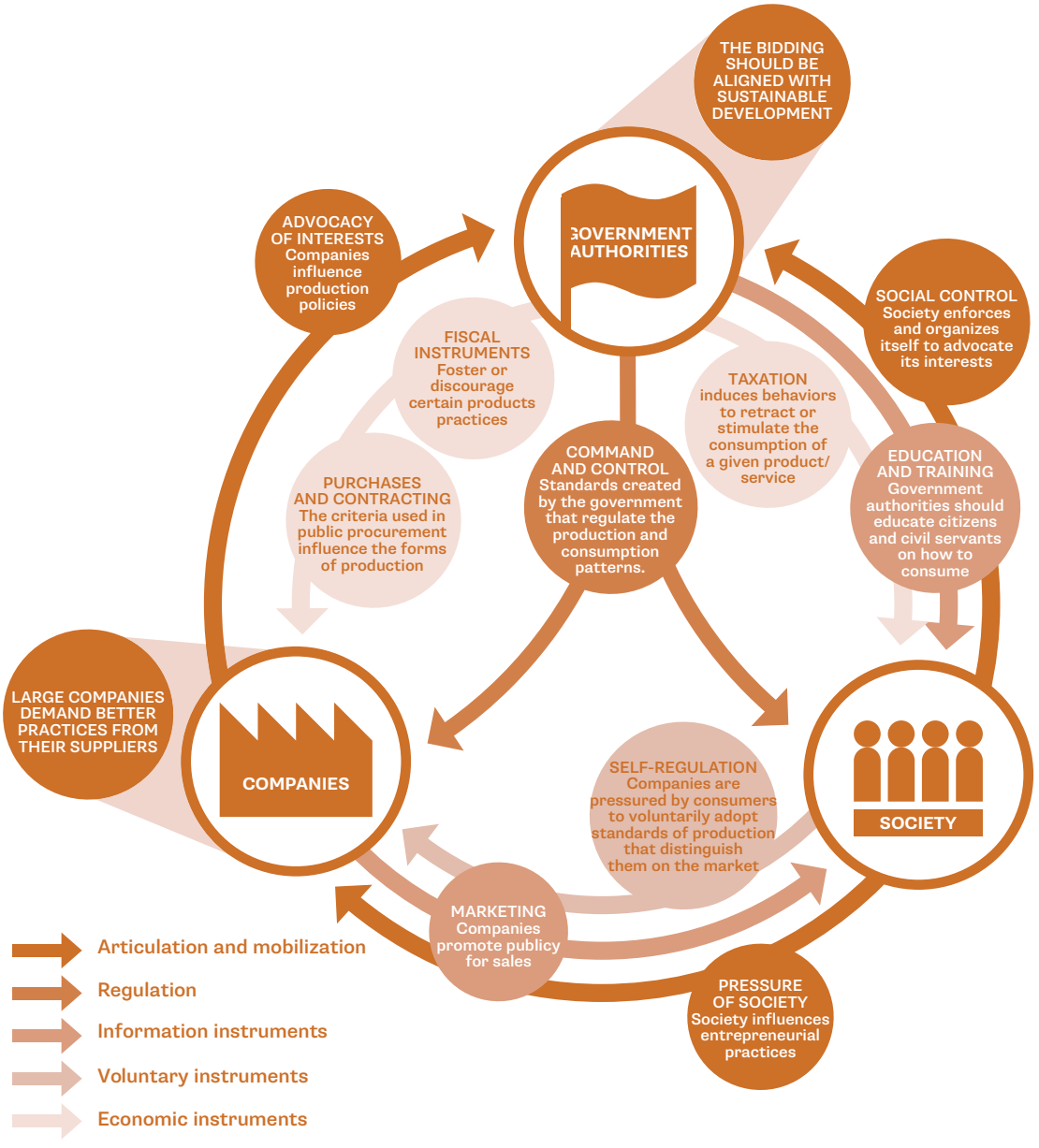

FIG. 5 Players in the process of Sustainable Public Procurement: Links that complete each other; Source: BETIOL ET AL. (2012).

Barriers	Category of analysis according to Matias-Pereira (2009)	Soluções possíveis a serem implementadas
Criterion for judgment, lower price for common goods.	» Diysfunction in the process » Government employees not trained	» Possible solutions to be implemented » Legal interpretation of the regulatory frameworks.
Automated use of Sustainable CATMAT, leading to the understanding that sustainable bidding ends when the good is acquired, ignoring other management mechanisms.	» Dysfunction in the process » Government employees not trained	» Public capacity-building Conjugation of Sustainable CATMAT with other public administration mechanisms » Public capacity building
Measuring the percentage of sustainable procurements, using Sustainable CATMAT exclusively.	» Lack of a model of consolidated bureaucracy » Dysfunction in the process	» Establishing other criteria to analyze the percentage of sustainable procurements that are not restricted to adopting the Sustainable CATMAT
Lack of knowledge by government employees when they draft the official notice on the technical aspects of sustainable goods.	» Government employees not trained	» Systemic view of public policies. » Articulation between plans and government actions. » Public capacity-building
Considerations of the Federal Audit Court against the use of certifications.	» Dysfunction in the process	» Public policy to implement public environmental certifications that do not restrict competitiveness. » Option to adopt sustainability criteria to replace the certifications. » Conjugation of both possibilities.
Absence of precise legal concept on sustainable bidding.	» Non existent » Airtight interpretive processes	» Legal hermeneutics that conjugates principles of environmental law in bidding. » Greater connectivity between environmental law and administrative law (for bidding).

TABLE 2 Bidding as an instrumento implement the public policy of sustainability.
Source: Research Data.

REGULATORY FRAMEWORKS THAT RELATE SUSTAINABLE PUBLIC PROCUREMENT JOINTLY FROM THE LEGAL AND ADMINISTRATIVE PERSPECTIVES

The systematization of regulatory frameworks (laws, decree and normative instructions of the Ministry of Planning) is presented seeking to contribute to the interdisciplinarity of sustainable public procurements. In their dispositions they join both legal and administrative aspects in government procurement. Based on the critical analysis of secondary data and physical artefacts used as a source in this study, the barriers were identified, including them in the Matias-Pereira's (2009) categories of analysis with the possible ways to overcome them.

FINAL CONSIDERATIONS

The analysis of government actions shows that the attention given to sustainable public procurement has grown very much in the last few years in Brazil. However, the initiatives are still limited and require a broader view of the product life cycle and its impacts throughout the supply chain.

The study leads to the conclusion that Brazilian federal public procurements have a great potential to contribute to strengthening relations between sustainability and public contracts, considering the State that consumes goods as an inducer of new markets and also bidding as a tool to implement this public policy directed at sustainability.

Several barriers, both legal and administrative, were identified which require the articulation of public policies, plans and government actions from an interministerial and interdisciplinary perspective that involves the different social acts. New regulatory frameworks and public training on the topic, structuring of routines and dissemination of sustainable public procurement as a mechanism of socioenvironmental administration.

A few key points are outstanding and shouild be further studied: environmental certifications, sustainability criteria and life cycle analysis as mechanisms in sustainable public procurement, consideration of the reverse flows in sustainable public constracts, and to what extent the current Brazilian bureaucratic structure can compromise the development of sustainable bidding, and what alternatives of public policy management can be presented.

REGULATORY FRAMEWORK	LEGAL ASPECTS	MANAGEMENT ASPECTS	BARRIERS	CATEGORY OF ANALYSIS, according to MATIAS-PEREIRA (2009)	POSSIBLE SOLUTIONS
National Policy of Climate Change Law 12.187/09	» Criteria of preference in biddings for the proposals that provide greater savings in energy, water and other natural resources, and reduction of greenhouse-gases and wastes.	»Saving water, energy, natural resources. »Measures to foresee, avoid or minimize the identified causes of climate change.	»Not self-applicable. »Little connectivity between public policies.	»Deficient strategy »Cultural issue	»Regulation by presidential decree. »Systemic view of public policies.
			»Articulation between plans and government actions. »The law presents possible solutions: (A) Stimulation and support to government participation. Production sector, academic milieu and organized civil society, in development and implementation of policies, plans, programs and actions related to climate change. (B) Promotion of dissemination of information, education, capacity building and public awareness building. (C) Articulation with instruments of government action, already established, able to contribute to protect the climate system. (D) promotion of the dissemination of information, education, training and public awaremess building about climate change.		
National Policy of Solid Wastes Law 12.305/10	»Priority, in government acquisitions and contracts, for : (A) Recycled and recyclable products. (B) Goods that take into account criteria compatible with socially and environmentally sustainable consumer standards.	»Management of solid wastes. »Integrated management of solid wastes. »Reverse logistics. »Sustainable production and consumption standards. »Shared responsibility for life cycle. »Systemic view in solid waste management. »Ecoefficiency. »Cooperation between government, entrepreneurial sectors and other segments of society. »Shared responsibility for the life cycle of products. »Socially responsible standard of consumption.	»New conceptual categories to be taken into account in public contracts. »Lack of knowledge and lack of clear definition about technical aspects of sustainable goods. »Implementation mechanisms still under development (sectorial agreements). »Difficulty of precise delimitation of the expression “socially responsible consumption standard”.	»Cultural problem. »Government employees not trained. »Non-existence of a consolidated model of bureaucracy »Airtight interpretive processes.	»Systemic view of public policies for selective collection, solid wastes and sustainable procurement. »Articulation between plans and government action. »Following the sectorial agreements »Regulatory frameworks. »Procedural frameworks. »Guidance manuals. »Public capacity building.
Law 12.349/10 (change in article 3, heading of Law, 8.666/93)	»Sustainable national development as the goal of bidding.	» Insertion of sustainability into the government procurements. »Bidding as an instrument to implement public policies.	»Lack of conceptual knowledge about sustainable development »Lack of knowledge about how to implement public policy.	»Cultural problem. »Government employees not trained. »Lack of a consolidated model of bureaucracy.	»Public capacity building. »Regulatory frameworks. »Guidance manuals.

		»Use of State procurement power.		» Airtight interpretive processes.	
Decree 7.746/12	»Goods constituted by recycled, non toxic or biodegradable material, among other criteria for sustainability. »Possibility of demanding certification issued by official public institution , or accredited institution, or by any other medium defined in the official notice. »Establishing sustainability guidelines (incomplete list): (A) Less impact on natural resources: flora, fauna, air, soil and water; (B) Preference for materials, technologies and raw materials of local origin; (C) Greater efficiency in using natural resources such as water and energy; (D) Greater generation of jobs, preferentially with local labor; (E) Longer work life and less cost to maintain the good; (F) Use of innovations that reduce the pressure on natural resources; (G) Environmentally regular origin of natural resources used in the goods.	»Institution of Interministerial Committee of Sustainability in Public Administration – CISAP to propose the implementation of criteria, practices and sustainable logistic actions within the sphere of the direct, autarchic and foundational federal public administration and the dependent state-owned companies.	»Lack of knowledge of the government employees about technical aspects of sustainable goods. »Processes to define sustainability criteria.	»Cultural problem. »Lack of a consolidadted model of bureaucracy. »Government employees not trained.	»Public capacity building. »Regulatory frameworks. »Guidance manuals.
Normative Instruction I 1/2010, MP	»Goods constituted in all or in part by recycled, nontoxic, biodegradable material according to ABNT NBR - 15448-1 e 15448-2. »Observance of environmental requirements to obtain the INMETRO certification. »Goods preferentially packed in appropriate individual packaging, with the smallest volume possible, using recyclable materials so as to ensure maximum protection during transport and storage. »Goods that obey the RoHS Directive.	Use of certifications.	»Government employees have difficulty identifying sustainable goods. »Understanding of the Federal Audit Court against the use of certifications because this involves several social actors with interests that could be in conflict.	»Government employees not trained. »Deficient strategy. »Lack of a consolidated model of bureaucracy. »Dysfunction in the process.	»Public policy that implements public environmental certifications that do not restrict competitiveness. »Option to adopt sustainability criteria instead of certifications. »Conjugation of both possibilities
Normative Instruction 10/12, MP	»Sustainability criteria. »Sustainable public contracts. »Solidary selective collection.	»Practices of sustainability »Practices of rationalization. »Solidary selective collection. »Shared procurement. »Sustainable Logistics Management Program . »Sustainable Esplanada Program.	»Lack of concatenated and interrelated actions in the different internal administrative sectors of a same government agency.	»Cultural issue. »Deficient strategy. »Dysfunction in the process. »Government employees.	»Administrative structure. »Institutionalization of routines that allow understanding sustainability in all department of the public agency. »Dissemination of sustainable public procurement as a sustainable mechanism for environmental management. »Public capacity building.

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LEARNING FROM CATADORES

STRUGGLE FOR RECOGNITION AND PUBLIC POLICIES: AN ANALYSIS OF THE EXPERIENCE OF PICKERS BELONGING TO ASMARE IN BELO HORIZONTE (STATE OF MINAS GERAIS) 1987-2010[1]

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Recyclable materials pickers are present almost everywhere in Brazil, usually working under very precarious conditions. They are part of a dynamics in which, surviving from garbage, they act as "outsourced workers", of the recycling industry, without any labor law rights (LAYRARGUES, 2002; LEAL ET AL., 2002; BOSI, 2008), nor any of the other rights that are part of being a citizen. At the same time they are involved in a major urban environmental problem – the final disposal of garbage.

At the end of the 1980s pickers began to organize into associations and cooperatives. This process began in a few Brazilian cities such as São Paulo, Porto Alegre and Belo Horizonte, and were an attempt to improve living and working conditions through claims on local governments. This later spread throughout the country in different forms, mainly beginning in the 1990s, chie-ving a nation-wide articulation in 2001, when the National Movement of Recyclable Materials Pickers [*MNCR Movimento Nacional de Catadores de Materiais Recicláveis*] was formed.

1 This chapter is the result of a Master's dissertation in public administration and government written by the author at FGV- EAESP: Pereira, M. C. G. (2011). Luta por reconhecimento e desigualdade social: uma análise da experiência dos catadores da Asmare em Belo Horizonte (MG). Dissertação (Mestrado em Administração Pública e Governo) – FGV-SP.

In this work we focus on the pickers' struggles and the construction of their claims, especially from local government, with a view to making public policies. We seek to analyze the relational construction of the pickers' struggles and claims, taking into account the feelings involved and the possibility of questioning the disrespectful attitudes they encountered, considering the high social inequality seen as natural in the country (SOUZA, 2009; KOWARICK, 2009; SPINK, M. J.; SPINK, P. K., 2006). The naturalization of inequality is the process of *"treating something as normal, as a given, and as part of everyday life; as obvious as the sun in the morning and the rain in the afternoon"* (SPINK, M. J.; SPINK, P. K., 2006, P. 8). Pickers, like many other Brazilians, are inserted into social relations in which social inequality is daily naturalized by symbolic mechanisms that legitimize their reproduction so that they constitute *"a class excluded from all material and symbolic opportunities of social recognition"* (SOUZA, 2009, P. 25).

To discuss the pickers' struggle we used Axel Honneth's theory of recognition (2003; 2007), which is part of the sphere of the critical theory of society. According to the author, the base of the interaction is social conflict and its moral grammar, the struggle for recognition, in a dialectical process of disrespect and recognition. This approach offers elements that allow discussing the opaque and naturalized aspects of social reality, considering human pain and suffering which are not always visible.

It should be pointed out that the perspective of struggling for recognition is not limited to making government policies, it goes beyond, and involves other dimensions in a permanent process in which society is transformed reflexively and alters patterns of social relationships (HONNETH, 2003). However, in the case investigated, it is essential to analyze the relationship with the State, since the latter plays a very important role in the recognition processes, especially in the generation of policies of access to rights and reduction of poverty and inequalities.

In order to discuss these issues, we analyzed the struggles of the pickers belonging to the Association of Paper, Cardboard and Reusable Material Pickers [*Asmare- Associação dos Catadores de Papel, Papelão e Material Reaproveitável*] of Belo Horizonte (MG). The association is one of the first experiments in organizing pickers in Brazil, and is considered one of the most succesful, especially with the new relationships established with local government. In 1993 a policy was created to support the pickers' work and the selective collection program was implemented in Belo Horizonte, together with *Asmare*. The experiment was permeated by various conflicts in a struggle for better living and working conditions for the pickers.

The purpose of this chapter is to analyze the struggle of the *Asmare* pickers and its consequences in public policies for this social group from 1987 to 2011. We attempt to discuss this struggle based on the senses and meanings present in the narratives of the actors involved.

ABOUT THE METHODS

The main methodological assumption of the study was the perspective of a field-theme (SPINK, 2003). Field-theme is a complex of networks of senses that are interconnected, it is a space that is constructed and negotiated, in which arguments with different aspects and materialities are constantly debated in many places (SPINK, 2003).

In an attempt to bring voices, knowledges and arguments in which senses are constantly being negotiated into the chosen field-theme - the struggle of the *Asmare* pickers in Belo Horizonte (MG) – two methods are used: case study and reading narratives.

To analyze the struggle of the *Asmare* pickers and its consequences in public policies, it was decided to adopt the case study strategy. The case study method seeks to interpret contemporary phenomena within their social context I (YIN, 2001), analyzing the senses attributed by the subjects to their life experiences and social practices (GODOY, 2006).

The case study and the reading of narratives allowed understanding the fluxes and refluxes, the comings and goings of the pickers' struggles, and the constant tension between disrespect and recognition, which is a constituent of social conflicts (HONNETH, 2003). The time period chosen was from 1987 to 2010, since the process of organizing the *Asmare* pickers began in 1987. We sought to explore the context and the process of change over time, looking at the temporal interconnectivity between historical and present phenomena.

To retrieve and analyze the events involved in the pickers' struggle, discussing the meanings attributed, the network of meanings and arguments which are interconnected between the past and the present (SPINK 2003) the study of narratives was adopted, following the proposal elaborated by Czarniawska (2000; 2004). The study of narratives is the study of how the actors tell their stories. The author highlights the fact that in all societies narratives carry knowledge, and constitute the most typical form of social life and a common form of communication (CZARNIAWSKA, 2000; 2004).

As the narrative goes about telling past experiences it involves creating meanings, in a restrospective process in which there is constant resignification and negotiation of meanings (CZARNIAWSKA, 2000; 2004). In this way, the narrative can be understood "as the discourse that deals with actions that occurred in the past" (ALVES; BLIKSTEIN, 2006, P. 406).

Czarniawska (2000) proposes using narratives in research, based on the following dynamics: to observe how the stories are created, to collect stories and provoke the act of telling stories, and later interpret (What they say?), analyze (How they say it?) and deconstruct the stories, aiming to build one's own story, as a researcher, placing it in contraposition to the other stories.

The author points out that there are several ways of reading narratives, suggesting three interconnected phases: explication, explanation and exploration. Explication involves the reconstruction of the narrated text (What does this text say?). Explanation comprises deconstruction, ie, disassembling the text to see how it was constructed (how or why does the text say this?). And, finally, exploration consists in the construction of the text itself by the researcher, ie., the construction of one's own history (CZARNIAWSKA, 2000).

The following were adopted as research techniques: interviews, conversations and analysis of documents. There were twenty-three interviews in all, five of which were made in July 2010, as an initial stage. Later, in October and beginning of December 2010, 18 in-depth interviews of the semi-structured type were performed, with *Asmare* pickers, members of organizations that support the association, current and ex-members of the local government and other actors involved in the experiment investigated.

Based on the first interviews, it was possible to map the actors involved in the experience. As the interviewees told their stories, they mentioned names of people and organizations that participated in the dynamics of organizing the pickers. In this way we interviewed the people most cited in the narratives. We conducted the interviews with the help of two scripts of questions, one elaborated for the *Asmare* pickers and the other for members of supporting organizations and former and current employees of the City Administration of Belo Horizonte. We taped the interviews and transcribed them, by taking sections of the the main utterances about each theme discussed in the scripts, and later analyzed them, according to Czarniawska's proposal of reading narratives (2000; 2004).

Besides the in-depth interviews, several spontaneous conversations were held in different places and on different occasions. Based on these conversations it was possible to identify meanings, fragments and a (few) part(s) of story(ies) that were not yet known. Being ready to dialogue and

the researcher's opening to conversations in everyday life, as Spink (2008) emphasizes, are important elements for the collective construction of knowledge. Documents were also analyzed such as laws, decrees, regulations and news items disseminated by the local media, as well as materials given by some interviewees, such as primers, folders, texts and informative newspapers.

STRUGGLE FOR RECOGNITION AND SOCIAL CONFLICTS

The topic of social recognition has grown in the last few decades, both in the academic sphere, in public debates, in social movements and in the political agenda of countries (HONNETH, 1996; 2007; MATTOS, 2006; FRASER E HONNETH, 2003; MENDONÇA, 2009).

The notion of social recognition began in the first works by Hegel (HONNETH, 1996; 2007). Honneth (1996; 2003; 2007) emphasizes that, except for Hegel, no classical thinker placed the principle of recognition at the center of their discussions. However, recently the concept gained great importance, based on the emergence of public debates and social movements that required a more marked consideration of the idea of recognition. This process includes mainly the discussions on multiculturalism and feminine struggles, which share the ideal that all individuals and social groups should be accepted and their differences respected. What has been seen in the last few decades is a plurality of uses of the concept of recognition, which leads to a variety of meanings attributed to the main category, as well as to the problem of each semantic meaning being connected to a specific moral perspective (HONNETH, 1996; 2007).

In the contemporary debate, the main authors who work with the theory of recognition are the Canadian political philosopher Charles Taylor, the American political scientist Nancy Fraser and the German philosopher and sociologist Axel Honneth. The three authors have a different emphasis and points of departure. Charles Taylor concentrates of the historical-philosophical fundamentation of the thesis of social recognition, even if, beginning with Hegel, the author reconstructs this category in an original manner, with language taking on a central role in its reconstruction. Nancy Fraser's analysis is based on recent social movements and on the political struggles that characterize them, holding a discussion with a dualist perspective between redistribution and recognition, which generated debates and dialogues with Axel Honneth,

in the discussion of recognition versus redistribution (FRASER E HONNETH, 2003). Axel Honneth is part of the sphere of the Critical Theory of Society[2], in his approach conflict is central (HONNETH, 1996, 2003, 2007, 2008A, 2008B, 2008C).

The foundation of Axel Honneth's (2003) theory is Hegel's conceptual model of "fighting for recognition". For Hegel, the formation of the human identity presupposes the experience of intersubjective recognition. By means of reciprocal recognition, the subjects establish a positive self-relationship in interaction with other subjects. But the search for recognition is permeated by a struggle, so that social conflict leads to an expansion of the relations of mutual recognition. Honneth (2003) has also used George Herbert Mead's social psychology to give the Hegelian theory an empirical inflection. Based on the main theoretical sources, Honneth tries to provide a foundation for the three forms of reciprocal recognitions, the respective forms of practical self-relationship provided to human beings and the dynamics of disrespect.

Emotional dedication (love) is the first stage of reciprocal recognition, limiting itself to primary relationships, ie, to the strong emotional connections between few people, such as the relationship betweeen two partners, friendships and parents and children. In the reciprocal loving relationship subjects know that they are united by the fact that they depend on their state of

neediness and feelings of the respective other, in a precarious balance between autonomy and connection (HONNETH, 2003).

The intersubjective experience of love involves a continuous affective dedication, which leads individuals to mutually reach an elementary self-confidence. The practical self-relationship generated is self-confidence, ie, an existential security and a confidence in oneself. This form of recognition constitutes the psychic presupposition and the structural heart of the intersubjective development of individuals. For Hegel individual self-confidence is the indispensable foundation for autonomous participation in public life (HONNETH, 2003).

The second form of recognition is by law – legal recognition – that occurs to the extent that one can reach an understanding of oneself as bearing rights, when one inversely possesses knowledge about the obligations to be observed in relation to another. Legal recognition occurs through respect to the attributes that make an individual morally imputable. These attributes are based on universalist moral principles and on a cognitive understanding which goes through processes of historical evolution, Present in these processes, are both

[2] Axel Honneth seeks to present a solution to the problems detected in his predecessors of the Critical Theory tradition, which, according to him has a "sociological deficit. According to Honneth, even Habermas, who considered sociology very important in his work, did not manage to correct this existing gap in Critical Theory.

extending rights to groups that until then had been excluded from the status of a person in law, and the expansion in terms of content (HONNETH, 2003). Likewise, there is the presence of tensions between proclaimed rights versus effectively exercised rights (MARSHALL, 1967). The positive self-relationship provided by juri-dical recognition is self-respect. On referring to himself as a morally imputable person, the subject achieves the possibility of conceiving their actions as an expression of their own autonomy which in turn is respected by all others.

The third form of reciprocal recognition refers to solidarity, through social esteem. Social esteem refers to respect for the particular properties that characterize human beings in their differences, ie, it is a socially defined value of the differential properties of individuals who contribute to the implementation of the culturally defined objectives. The definition of this value presupposes a set of values that are intersubjectively shared in a universal manner, formed from a picture of symbolically articulated orientations. This picture is always open and porous, and it is here that the ethical valules and objectives are formed that constitute the cultural self-understanding of a society (HONNETH, 2003).

Social esteem, like legal recognition, undergoes historical and cultural variations, and is defined, essentially, by the interpretations which predominate historically, of the symbolically constructed social purposes in a society. The content of these interpretations is influenced by the social groups that manage to interpret their own achievements and life forms publicly as valuable. The positive self-relationship that the subject develops from this form of recognition is self-esteem. This self-relationship occurs insofar as the individual is esteemed for their specific qualities, be it the presentation of achievements or the possession of capacities that are recognized as valuable by the other members of society, in a process of solidary acceptance (HONNETH, 2003).

Honneth (2003) associates forms of disrespect and recognition denied with the three types of recognition. He emphasizes that non-recognition and the experience of disrespect can lead to psychic wounds that can demolish a person's identity, since one may injure the positive self-understanding of oneself.

Physical abuse comprises a type of disrespect that deeply injures self-confidence, developed through emotional dedication. An individual who suffers physical humiliation is deprived from the bodily manifestation of his autonomy, and as a consequence loses self-confidence and confidence in the world. This extends to the practical relationship with other subjects. Physical disrespect is not inserted into a process of historical change like the two other types of disrespect.

The second form of disrespect refers to deprivation of rights and to social exclusion that affect the moral self-respect of an individual. These are situations in which the dignity of human beings suffers on being structurally excluded from the possession of certain rights in a society. In this way, individuals are not granted moral imputability in the same measure as other members of society. This form of disrespect not only generates a limitation of personal autonomy, but also a feeling of not having the status of an equal partner in interaction. The individual is affected regarding their intersubjective expectation of being recognized as a capable subject, which leads to a loss of self-respect (HONNETH, 2003). This form of disrespect is historically variable, since the semantic content of what one considers a morally imputable person undergoes changes as legal relations develop. The deprivation of rights is related to the degree of univer-salization, and also the material reach of rights, and therefore to the very notion of citizenship, which is a historical concept whose meaning varies in time and in space (PINSKY E PINSKY, 2003).

The third form of disrespect refers to degradation and insults, in which a depreciation of individual or collective modes of life occurs affecting self-esteem. When some life forms are degraded, considered of less value, the possibility of an individual ascribing a social value to their own capacities is affected. The devaluation of given forms of self-realization generates in the individual a loss of the possibility of seeing oneself as a being whose specific particularities and capacities are esteemed, in other words this leads to loss of self-esteem (HONNETH, 2003).

Sennett (2004) highlights that in modern societies there is a scarcity of respect and recognition by others. In many societies with a high level of inequality, like in Brazil, the great majority of people are disrespected daily.

Honneth (2003) argues that the experience of disrespect may become the motivational impulse of a struggle for recognition, since the affective tension resulting from suffering humiliations may be dissipated in the possibility of active action. Feelings of this kind may become the motivational base of collective resistance when the subject can articulate them in a picture of intersubjective interpretation which proves that they are being experienced by an entire group, From this perspective, the emergence of social movements depends on a collective semantics that allows interpreting the experiences of personal disrespect as something that affects not only an individual, but many others. For the author,

> *[...] all social confrontations and all forms of conflict would be basically constituted according to the same model of a struggle for recognition: in this case every collective act of resistance and rebellion would be*

> *attributed, according to its origin, to an invariant picture of moral experiences, in which social reality is interpreted according to a historically changing grammar of recognition and disrespect.* (HONNETH, 2003, P. 260)

The struggle for recognition is an unfinished and dialogical process, marked dialectically by the dynamics of disrespect and recognition. Honneth's perspective of a struggle for recognition is still under development, as emphasized by Souza (2000). Over the years he has been the target of different criticisms[3]. Some led him to a new development in later works (HONNETH, 2008A; 2008B; 2008C). In the sphere of criticisms regarding Honneth's approach, it is worth briefly highlighting a few points of the debate between the author and Nancy Fraser about the concepts of recognition and redistribution[4]. As to this aspect, it should be pointed out that the issue of redistribution in Brazil is certainly fundamental. And, especially, in the phenomenon researched here, the dynamics of the pickers' organization, since there is a struggle for survival, for access to a minimum of economic resources for basic needs such as food.

Fraser (2007) argues that there is a tendency for transition of the struggles for redistribution to those for recognition, as well as a broader political movement within the sphere of this displacement. However, the author points out that this dissociation between recognition and redistribution is enough to think about justice, proposing a dualist perspective based on a broad concept of justice that will cover both redistribution and recognition, involving the notion of parity of participation. Fraser believe that Honneth subsumed the struggles for income distribution to recognition and that he takes on a culturalist, reductionist view of distribution, when he assumes that the economic inequalities are rooted in the cultural order (FRASER, 2007).

On the other hand, Honneth (2007) argues that in Fraser's approach there is a reduction of social recognition, in a single dimension, as though it were only the cultural acceptance of distinct forms of life or all demands that can fit under the banner of "identity politics". Fraser decharacterizes Honneth's approach on emptying the concept of recognition making it a simple struggle for the valuing of minority cultural identities (MENDONÇA, 2009).

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[3] There are different critiques of the theory of recognition such as that pointed out by Bohman (2007) who argues that the theories of Fraser and Honneth do not adequately explain a central phenomenon of contemporary societies: *"domination as structural exclusion rather than tyranny or the lack of parity"* (P. 268). According to Bohman, domination is not a discipline of institutionalized cultural values nor of parity in participation, since both are related to broader conditions of freedom that are not realized only in the dimension of the economic world and the cultural world.

[4] For further details about this debate, look at: FRASER; HONNETH (2003), MATTOS (2004; 2006), PINTO (2008), MENDONÇA (2009), and others.

For Honneth (2007), the concept that there is a tendency of passing from social struggles for redistribution to recognition is mistaken, highlighting that in the same way as the social movements of today cannot be reduced to simply cultural objectives,, those of the 19th century and beginning of the 20th century cannot also be reduced to mere material demands. For Honneth (2007), recognition includes the dimension of the demands for redistribution so that the struggles for recognition are present in all redistribution conflicts.

The author highlights that the demands for material redistribution are based on a democratic ethics from two sources. On the notion of equality before the law that promises equal treatment for all members of a democratic community so that the concession of social rights and redistribution have the normative function of giving each citizen the opportunity to participate in the democratic process of public formation of a community. And on the normative concept that each member of a democratic society should have the chance of being socially esteemed for their activities and individual capacities. For Honneth (2003), this pattern of social esteem corresponds to what Fraser calls a *"just distribution"*, ie., *"the rules that organize the distribution of material goods derive from the degree of social esteem enjoyed by the social groups, according to the institutionalized hierarchies of value or a normative order"* (P. 92).

Mattos (2006) points out that, for Honneth, the analyses of distribution should consider the partial incorporation by the Welfare State of the resource of social esteem. For the author, the advance of the principle of equal legal treatment occurred independently, or at the cost of the notion of differential performance. Thus, a smaller number of resources begins to be distributed under the principle of social rights, while the larger part continues under the aegis of the principle of performance, which is the only justification and form of legitimizing capitalist inequality (MATTOS, 2006). Souza (2009) emphasizes that the notion of differential performance and the ideology of the meritocracy are what allow the legitimation of social inequality in modern societies.

In this way, in a counterpoint to Fraser, Honneth (2006) emphasizes that

> *[...] conflicts about distribution, as long as they are not merely concerned with applying the institutionalized rules, are always symbolic struggles for the legitimacy of the sociocultural device that determines the value of activities, attributes and contributions. In this way the very struggles for distribution, on the contrary of Nancy Fraser's hypothesi,s are waged in a struggle for recognition.* (P. 92)

Honneth (2007) argues that the rules of distribution should be seen as an institutional expression of a sociocultural device that determines the level

of esteem that certain activities occupy at a given time, and cannot be simply derived from production relations. Thus, it is a struggle for the cultural definition that makes an activity socially necessary and valuable. Based on these considerations, the author emphasizes that there is a challenge to democracies, because of structural unemployment, since there are a growing number of people who do not have the opportunity of obtaining recognition for the skills acquired, connected to social esteem. In this context, the author highlights that

> *[...] we may expect a growing number of struggles for recognition, directed towards the institutionalized definitions and measures of social esteem that rule which activities and skills may achieve symbolic and material recognition. Without a radical expansion of the meaning of "work", and what can sensitively and justifiably be included in this, the struggle for recognition that is approachign cannot be readily resolved.* (HONNETH, 2007, P. 93)

No matter how much structural unemployment, informality, weakening of ties and flexibilization processes are occurring (CASTEL, 2000; KOWARICK, 2009; HONNETH, 2008C), the work is highly relevant in the socially experienced world, not only because it ensures material subsistence, but also because of the fact that most of the population derives its identity from their role in the organized process of work (HONNETH, 2008C).

THE STRUGGLE OF THE ASMARE PICKERS BASED ON READING NARRATIVES -AMIDST THE GARBAGE AND "CONFOUNDED " WITH GARBAGE: THE BEGINNING OF A NEW LOOK WITH THE ARRIVAL OF THE STREET PASTORAL (1987-1992)

The dynamics of the *Asmare* pickers' struggle began in 1987, when a few nuns of the Oblate Fraternity of São Bento arrived in Belo Horizonte bring the experience and work methodology already developed in São Paulo (SP), in the Organization of Fraternal Help (*Organização de Auxílio Fraterno* [*OAF*]), with the street population.

In the same year they founded the Street Pastoral of the Belo Horizonte Archdiocese, following the same proposal as the work developed in São Paulo. One of the Benedictine sisters told that initially they held a meeting with some pastoral agent and Church people who already had some contact with the street population in Belo Horizonte. They began by mapping the places where there was the highest concentration of street people and realized that a significant number of people survive from picking materials in the garbage. All pickers lived on the streets. Even those who had a home, generally returned there only on the weekend, since they worked during the night and had to sort and watch the material they had collected.

The Benedictine nun told that the pickers were literally "confounded" with the garbage, that *"society did not believe, nobody acknowledged them sometimes even as people"*. They were not considered worthy of respect and consideration by society. The pickers were the target of various acts of violence, such as physical assault. In the so-called *"clean-up operations"* carried out by the Urban Cleaning Authority [*SLU Superintendência de Limpeza Urbana*] with the support of the police, the picker were forcibly expelled from the places wher they worked and the material they picked was taken to the sanitary landfill. A woman picker told that they threw everything into the truck: *"sometimes there was even a child in a box, and they just threw"*.

The pickers told that they also suffered physical assault by the police, as a woman picker who recalled the day her mother was beaten by a policeman. Besides the physical assault suffered externally, there was a lot of violence in the relations between them, as a former pastoral agent told. The women were often physically assaulted, they were always beaten by their male life partners.

Under these conditions, characterized by physical abuse, the self confidence of the pickers was highly compromised. Another form of disrespect, present in the narratives, refers to the privatization of rights, such as denying the right to work, to food, to health, to education and to housing, among other rights that configured exercising citizenship. The deprivation and destitution of rights characterized the situation of this group and still do today. A picker told that,

> *[...] I thought that I was not a citizen, I already was, but I thought that I wasn't, [...] I thought that I did not have the same right as everyone had, I thought that my right was less than that of everyone [...] Afterwards I learned this, I have the same righty you have, that anyone has.*
> (PICKER WHO IS A MEMBER OF ASMARE)

In this utterance, as in others that reported the conditions under which they lived, it can be noted how the practical self-relationship of self-respect was difficult to develop, considering the disrespect suffered and the recognition denied.

The pickers, besides not being considered morally imputable individuals, and on an equal footing in interaction with others, faced another form of disrespect – degradation and insults. In several stories and events, all pickers told of the discrimination and prejudices suffered. One woman emphasized in a strong, suffering voice, that *"paper pickers were seen as garbage"*. They were seen by the population as social outcasts or beggars, and not as workers, as the picker told:

> *Formerly paper pickers were seen as social outcasts, they were not considered workers, as though they were dirtying the city. We suffered a lot from prejudice on the streets [...] There was a lot of discrimination, police, and so on [...] What also affected me very much was a girl who was throwing paper at me, abusive, a student, but in those days there wasn't no Asmaret.* (FEMALE PICKER FROM ASMARE)

Based on this utterance it is possible to identify disrespect and how self-esteem was affected. But besides the recognition that was refused, it is possible to observe, in the passage *"in those days there wasn't no Asmare"*, that change occurred in the form of interaction with people and in the way the pickers were seen and how they saw themselves after the association was formed.

It is interesting to note that the three domains of recognition and the corresponding acts of disrespect formulated by Honneth (2003) in practice are highly imbricated, and their paths cross all the time. The first sphere of recog-nition, emotional dedication, with its corresponding form of disrespect, the abuse and the violation, in practice presented itself imbricated to the two other spheres. For example, when a picker was the target of a *"clean up operation"*, it was not only his civil rights that were violated, but also his physical integrity, since generally they were physically assaulted during these actions. And, at the same time they were offended and degraded, since the activity they performed was not considered work, but rather a form of disturbance of public order and urban cleaning.

It was in this social context, that the Street Pastoral began working with the pickers. One of the fundamental aspects was the form of approach. The Pastoral coordinator told that they approached to chat and listen, by means of small meetings, seeking to establish ties of mutual trust. A former pastoral agent also stressed that the approach was based on listening and on

conversations. As some trust was established, they discussed the life situation of the pickers, the working conditions, the problems and, at the same time showed that the work they were doing as pickers was important for the environment and for society. He reported that they spent almost all Sunday afternoons with the group that lived on the grounds of where the main shed of *Asmare* is now located. On Sundays the pickers drank a lot and worked less. When the pastoral team arrived, they reduced the doses of alcoholic beverages and at the end of the day they were more sober. The agents arrrived, sat in the circle, sang, listened to stories, prayed and chatted. They also held parties and celebrations with the pickers, as a female picker told.

The interaction of the Pastoral team with the pickers tried to recognize the other, with a different look, in a socialization process based on Christian values and principles. This form of interaction appears to have been the key point and the base of the entire organizational dynamics that was to come in the following years.

In 1988[5] there was a *"clean up operation"* that was narrated by the pickers, former pastoral agents and by the Pastoral coordinator, as a marked event in the process of constructing *Asmare*. During the early hours of the morning on August 22 of that year, there was a violent action to remove a group of pickers from the occupied land, which belonged to the former Brazilian Urban Transport Company (*Companhia Brasileira de Transporte Urbano* [*CBTU*]) and is now the HQ of *Asmare*. The city administration and the military police threw down all the canvas tents, violently expelled the pickers, even assaulting them physically. When morning came, the Pastoral team heard what had happened and went after the pickers who were spread throughout the city. The Pastoral coordinator told that after finding them again, they held a meeting to discuss what had happened, encouraging them to fight for their rights. The pickers occupied the land again and the Pastoral looked for spaces to denounce the violence that had been carried out against the group. She tells that they obtained the support of the Pastoral of Human Rights and in the City Council, from councilor Patrus Ananias of the Workers Party [*PT - Partido dos Trabalhadores*]. As a first form of denunciation, they and the pickers, together, wrote an Open Letter to to Population of Belo Horizonte. Here is a section of the document:

> *The city administration transformed us into garbage; we the paper pickers, have family and children to take care of, today we live from paper. If it were not for us, the city administration wouldn't manage*

[5] The period corresponds to the administration of Mayor Sérgio Ferrara of the PMDB (1986-1988).

to cleanour city. The city administration arrived on August 22, at 4 am,pulling down the tents with the things and all of us inside. We did not even have time to remove things; we lost everythng: documents, belongings, we lost the paper. The tents were on Contorno Avenue, on the banks of Arrudas River, behind the Bus Station, and there we were, without anything, and without a place to go. Why does the City administration mistreat us, paper pickers? You have families, you are human beings like us, would you like to live the life we lead, living under the overpasses and marquees, running from the police? You depend on the people as we depend on the garbage to live. We are all on the street. What can you do for us?

In this section is is interesting to analyze especially three sentences — *"You depend on the people as we depend on the garbage to live. We are all on the street. What can you do for us?"* These sentences denote the relationship between the State and the population in the same measure as the relationship between the picker and, both in a situation of dependency. The State is for all and assumes the universalization of rights and duties. Likewise, there is no State without a nation and populations. Equally, the picker depends on garbage to survive, since he has been denied basic rights. These sentences express simply and profoundly that "there are no rights unless they are for all", since the state is universal. However, the situation portrayed in this section shows tension, contradiction: the complete denial of legal recognition and of many other spheres of recognition.

In its turn, this event, narrated as causing much suffering, strengthened their ties with the Pastoral, and amongst themselves. A process of mobilization and demands began, although it was incipient. The Pastoral coordinators told that from this event onwards, they did everything to create an association for the advocacy of rights.

In 1989, work with the pickers was intensified, in order to encourage them to form an association. The pickers told that several meetings were held, in different meeting spaces such as overpasses, streets, empty lots and religious spaces.

This process culminated in founding *Asmare*, initially with 10 members, in an assembly held on April 27, 1990. The association became official on May 1, 1990, with a party.

-THE FIRST YEARS OF ASMARE, MAIN DEMANDS, DIFFICULTIES AND ACHIEVEMENTS-

The first years of *Asmare* were intense, with many mobilizations and demands. The pickers narrated that they held several protest marches with their carts in the downtown area, and demonstrations in front of the city hall. A former member of *Caritas* told that they tried to show the people of Belo Horizonte that the pickers were not beggars, nor outlaws, but workers demanding the right to work.

All the interviewees told that at the time, their relationship with the city administration was very conflictive. The actions for repression continued during the administration of then mayor Eduardo Azeredo (1990-1992), of the PSDB. The Street Pastoral sought to establish dialogues with the municipal adminis-trations but could not achieve satisfactory results. In the City Council they obtained the support of some councillors. Those mentioned most in by the pickers and former pastoral agents, respectively, were Antonio Pinheiro (PSB), João Bosco (*PT*) and Patrus Ananias (PT).

The former member of *Caritas* told that they also sought the support of a woman who was a sanitary engineer and a government employee with the Technological Center of Minas Gerais [*CETEC- Centro Tecnológico de Minas Gerais*] and worked in the field of solid waste management. She told that she supported the process of organizing the pickers, collaborating to train them, with courses on solid waste and recycling, and designing a shed.

Based on moblilizations and supporting articulations, already in the first year after *Asmare* was formed, one of the achievements was to write into the Organic Law of the Muncipality that selective collection should be done preferably by work cooperatives (BELO HORIZONTE, 1990). The Organic Law rapporteur was Patrus Ananias, who at the time was city councilor and supported the pickers, and approached this group based on its connection with the Catholic Church.

Another demand made to the public authorities was that they build a shed for sorting and storing the material. Again they demonstrated several times, with protest marches and negotiations, until in 1992 a shed with minimal infrastructure was built on the land occupied by the pickers. The construction of the shed was told by the pickers as a great victory. However, the next demand was to have the water system connected there. The former member of *Caritas* told of the demonstration they made in front of the city hall to get the water connected:

I remember a very nice scene [...] we stopped with a Kombi van, the city administration did not want us to remain there [in the current shed that is the seat of Asmare], they cut off the water and then we went to demand a water tap from the city administration, the police didn't allow us to get through, Dona Maria Bras took the sound car, and it was the first time I saw one of the pickers have the courage to speak out publicly about their situation, then she stopped and another came and took it up, they denounced all that situation. Then we entered, the police in front of us, through the Afonso Pena, we entered stealthily through Goiás Street, and a smaller group, and we occupied the Mayor's office to ensure the first conversation, it was like that. So it was a very painful process.
(FORMER MEMBER OF CÁRITAS)

The demand to get the water connected was also remembered and narrated by four pickers. In this utterance, however, it is interesting to analyze not only the courage of the pickers to express their social conditions publicly, but to verbalize the lack of respect given them, they may have demonstrated the lack of a practical self-relationship connected to legal knowledge, self-respect. Honneth (2003) says that empirically it is possible to find self-respect through the fact that it is lacking, in situations in which the affected groups themselves publicly discuss the deprivation of fundamental rights. This situation can be seen in events like the Festival of Garbage and Citizenship [*Festival Lixo e Cidadania*] and others[6], in which the pickers reveal the disrespectful way they are treated.

Once the shed was built and later the water connected, the association slowly became structured. One woman picker told that the first carts were donated by a priest and sisters of charity, the press was donated by Brazilian *Caritas* and the scales by the Archidiocese[7] of Belo Horizonte. At the end of 1992 there was yet another considerable achievement. In the month of December an agreement for cooperation was signed between the City Administration, *Asmare* and the Archidiocesan Mitre, which made it possible to maintain the shed. The coordinator of the Street Pastoral also reported

6 Participating in the 7th Festival of Garbage and Citizenship, held in Belo Horizonte, the lack of self -respect could be seen, when the pickers talked about all the disrespect that had been directed at them, and still was. Also at other events , such as the 1st Dialogues on Inclusive Businesses (1° Diálogos Negócios Inclusivos) (São Paulo – 2009) and Recycling Seminar: sustainable methodologies for wastes and social inclusion (Seminário Reciclagem: metodologias sustentáveis para os resíduos e a inclusão social)(São Paulo – 2010).

7 Legal form of the Belo Horizonte Archdiocese which legally represents the Street Pastoral.

that they looked for nearby schools for the pickers' children to attend, and there was an effort to obtain housing, since most of them did not have a place to live.

In the narratives of the pickers and of the supporting actors involved in the construction of *Asmare*, it is interesting to note how much the first years of the association were marked by mobilizations and demands. The demands of this period were mainly to exercise rights, such as the right to work, the right of free movement, access to food, housing, and others, and in turn, for changes in the everyday interactions between pickers and the population of *Belo Horizonte*, in a struggle to be considered individuals who were equals in interaction with others. At the same time, a struggle agains degradation and insults was imbricated, and also against the violation of physical integrity that generally occurred during the "clean up operations" performed by the *SLU* with the support of the police.

It is also essential to observe the role of the Catholic Church in the entire process, as in the mobilizations and articulations of support. Many people supported the pickers because of their ties to the Church. The Benedictine nuns were the first to "see" the dimension of the pickers' suffering and to problematize the relationship of society and the public authorities with this group. During this period the feelings ascribed to the pickers, and to the work they performed were associated with begging, delinquency, dirt and disturbance of urban cleanliness. both by the municipal authorities and by the population of Belo Horizonte. The actions of the public authorities were to repress, by carrying out many "clean up operations'."

Seeking a contraposition to these senses, the Street Pastoral ascribed new meanings to pickers and to the work of picking, emphasizing the value of human life, the situation of poverty, exploitation and violence to which they were submitted, in brief the social injustice present in this dynamics. It considered them workers whose work contributed to society, to urban cleanliness and to preserving the environment.

It should be emphasized that these feelings in contruction were part of a larger context. The end of the 1980s was marked by the redemocratization of Brazil, by the construction of the "Citizen Constitution" in 1988, in a period of significant changes in the political and social situation of the country. Also, at the beginning of the 1990s, environmental matters wre gaining greater public repercussion, especially because of the 1992 Earth Summit held in Brazil. After this Summit, recycling began to be very much disseminated in the country (PORTILHO, 2005). For Honneth (2003), the political and cultural surroundings are essential for the experiences of lack of respect to become the base that guides forms of political resistance

-FROM "ENEMIES OF URBAN CLEANLINESS" TO "PRIORITY AGENTS" OF THE SELECTIVE COLLECTION PROGRAM: THE BEGINNING OF A NEW RELATIONSHIP WITH LOCAL PUBLIC AUTHORITIES (1993 - 1998)

The 1992 municipal elections were won by candidate Patrus Ananias of the Popular BH Front [*Frente BH Popular*] ccoalition led by the PT. During that administration, new work began for solid waste management in Belo Horizonte. The sanitary engineer from CETEC was appointed superintendent of the *SLU*. She, like Patrus Ananias, already supported *Asmare*. On taking up the position, the former superintent told that she began the process of constructing the selective collection program in joint work with the Street Pastoral, *Caritas* and *Asmare*.

An ex-analyst of social mobilization who worked from 1993 to 2002 at *SLU*, told that the process was very participatory, and work groups were created with technical people from *SLU*, members of the Street Pastoral, *Caritas* and *Asmare*. Based on the meetings and joint discussiosn, through the work groups, they structured the selective collection program. They defined that selective collection would be done point to point, ie,. through Voluntary Delivery Places [*LEVs- Locais de Entrega Voluntária*], where the population would place their recyclable materials that had already been separated at home. And the pickers would collect them with their handcarts. The agreement between the City Administration, *Asmare* and the Street Pastoral was implemented, and an additive term was included that broadened the scope of the action of the City Administration and formally acknowledged *Asmare* as a priority partner in the selective collection program of Belo Horizonte.

The attributions of the public authority were connected to creating the conditions for the association to function. The following are highlighted: To provide a logistical and operational structure to support the pickers' work, with sorting sheds and implementation of the LEVs, to advise in the process of training the pickers through *SLU* and the Municipal Department of Social Developemnt [*SMDS- Secretaria Municipal de Desenvolvimento Social*], besides transferring monthly financial resources for maintenance, supplying uniforms, individual safety equipment and transport vouchers for the pickers. It was also the job of the city administration to disseminate selective collection to the population and show the importance of *Asmare*'s work, emphasizing the environmental, social and economic benefits. The Street Pastoral had the

responsibility of faithfully fulfillng all obligations taken on by *Asmare*, supporting the pickers in their work and organization. *Asmare*, in turn, was tasked with collecting recyclables, taking care of the shed, making a cadaster and identifying the members, expanding the association and taking care that everything went well.

It should be emphasized that the agreement, with respective transfer of funds to *Asmare*, was established within the sphere of the SMDS, to which it still belongs in the current Associate Municipal Office of Social Work [*SMAAS- Secretaria Municipal Adjunta de Assistência Social*]. According to the narratives of a former analyst of social mobilization and a picker who is currently a national leader of *MNCR*, the agreement was kept under SMDS for legal reasons, since at the time the *SLU* could not establish this agreement. It should be pointed out that during this period SMDS began to have as one of its basic programs the Street People Program [*Programa da População de Rua*], in work articulated with the Street Pastoral, and in the agreement it was decided that former street people would be sent to *Asmare*, via SMDS, as a way to include them professionally, and this relationship still prevails.

On the other hand, the former member of *Caritas*, the analyst of public policies of *SMAAS* and one of the current coordinators of the selective collection program indicate that maintaining the agreement at SMASS is what enabled it to continue over the years, because, according to them, if it were in the *SLU* it would possibly already have been closed down. On the other hand, a picker from *Asmare*, currently an *MNCR* leader, emphasizes that the recognition of the pickers by the local public authorities is portrayed as social work. He points out that one of the struggles of the *MNCR* is for the payment of services supplied by the pickers for the municipalities, through service contracts, as allowed by the National Law of Basic Sanitation n°11,445/07.

As part of structuring the selective collection program, the former superintendent told that the “clean up operations” and inspection were removed, and a new approach to the pickers began. She tells that they employed psychologists, sociologist and pedagogues to structure multidisciplinary teams to approach the pickers in joint work with the Street Pastoral. These professionals comprised the Consultancy for Social Mobilization [*AMS Assessoria de Mobilização Social*], of the *SLU*, that was created especially to construct the selective collection program and for the development of new actions in terms of the urban cleaning policy, such as the sensibilization and environmental education of the population.

One of the first actions of the MAS team and of the Street Pastoral was to create a cadaster of the pickers in the city and of their main meeting points.

The ex-superintendent told that they identified 49 points of picker concentration and accumulation of recyclable materials in the central area. She said that the mayor gave *SLU* a set period to solve the situation, since the concentration of pickers sorting the material in the downtown area was the subject of many complaints from the population and criticism from the local media, as a former coordinator of the selective collection program stressed, when recalling the many phone calls of complaints received daily by *SLU*. The former coordinator also reports the level of rejection of the pickers among the population:

> *[...] people wanted us to clean the city, our idea, what happened was that people wanted us to pick up that pack of solid wastes, material and human, collect them, compact them and take all to the sanitary landfill. The impression, I say, that is the best, the way I translate what we felt. People 'look this city is filthy, those pickers', that is, they complained as much of the pickers and of the garbage, it was absurdly difficult. So at the same time as cleaning the city, which was to take the picking process of the streets, and this was a serious problem also for the mayor.*
> (FORMER COORDINATOR OF THE SELECTIVE COLLECTION PROGRAM)

In this utterance, as in others, respectful relations are clearly absent. (HONNETH, 2003; SENNETT, 2004) and the perception of that context and of the situation of the pickers as "human refuse", the expression used by Bauman (2005), namely, considered redundant and dispensable individuals who share the semantic universe of "refuse", "remnant", "garbage",, and, in their turn literally surviving from garbage, living amid the garbage and "confounded" with the garbage, in a situation into which the metaphor of Bauman (2005), to a certain extent interestingly fits. However, the pickers were not and are not in any way dispensable in the different production chains of recycling[8], on the contrary, since they are the base that sustains almost all chains (BOSI, 2008). This utterance also demonstrates the constant tension between disrespect and recognition. This tension is dialectical and is part of the social conflict into which the pickers are inserted.

The street approach to the pickers, performed by the Street Pastoral and the *SLU* team continued, but it was a gradual process of approaching and convincing that required time. The former superintendent told that, at a meeting with this team, she set a time for them to bring the pickers to the shed, which they rented and renovated. However, once this time was up,

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[8] Each type of material has a specific production chain, such as paper, cardboard, aluminum and the different types of plastic.

they had not yet convinced them to go to the shed and asked for more time. She told that she gave two more months, but after this period the pickers had not yet accepted, since they were suspicious and did not want to come off the streets. She emphasized that they did something a bit radical, which the Street Pastoral and the team of psychologist and sociologists of LU were against. The removed all the pickers' materials and took them to the shed, informing them that this would be their new work place. The pickers were taken to the shed on Curitiba Street in July 1994. With this action they removed 46 sorting points from the streets, supplying work space for 85 pickers who became members of *Asmare* (DIAS, 2002).

The former superintendent emphasized that this was a very tense period and that the action was highly criticized by the Pastoral, that considered that they were going too fast with the process of popular education. It should be highlighted that in the narratives of the members of the Pastoral and of *Caritas*, neither this conflictive situation nor any difference of opinion were mentioned when they told about this period. On the contrary, they emphasized it as the best time with considerable advances.

The shed that was the headquarters of *Asmare* and the shed on Curitiba Street had a work structure with divisions for sorting, weighing, pressing, bathrooms and refectories. And they had a team from the Street Pastoral, *SLU* and SMDS that did follow up. In addition an administrator, an accountant and and administrative assistants were employed for the administrative management of the association, through the agreement between the *PBH* (*Prefeitura de Belo Horizonte* - BH City Administration), the Street Pastoral and *Asmare*.

Other actions developed during this period, highlighted by the former superintendent, were employing interns to provide additional schooling and develop pedagogical activities with the pickers' chldren and to run workshops. A former pastoral agent and four pickers also highlighted the workshops created in 1995, such as for sewing, artisanal paper, objects made from recyclable materials and carpentry. The latter is a school workshop for the pickers' children, where the carts used by the pickers and the containers to store recyclables are built, besides other objects. The same year improvements were performed in the operational infrastructure of the shed that was the headquarters of *Asmare* and, in 1996, another shed was rented.

At the same time and as part of this set of actions, work was done by MAS, to sensibilize the population regarding selective collection, the picker's work and urban cleaning as a whole. A former coordinator of the selective

collection program told that the social mobilization work tried to change the city's imaginary about pickers and the problems of garbage. She emphasized that they had a theater group that did several things, using art to mobilize the population in various places, such as schools, squares, streets and other public space.

Among the social moblization activities, the outstanding one in almost all narratives, including that of the former coordinator, was the Pickers' Carnival, which began in 1994. The pickers' parade took place after the presentation of the traditional Banda Mole of Belo Horizonte, the costumes worn were made entirely of recyclable materials. The participants in the parade were the *Asmare* pickers, *SLU* employees and sympathizers. The former superintendent emphasized that the Pickers' Carnival made newspaper headlines. Some pickers look back fondly on the times of that Carnival which is no longer held (the last parade took place in 2006).

The Pickers' Carnival can be considered a symbolic mechanism to enhance the social value of the work developed by the pickers in association with the issue of the environment, and at the same time of the social value of those individuals. It was a way of pointing out the neglected importance of properties and capacities presented by the pickers, given the lack of respect and of consideration to this group in everyday social practices and relations (HONNETH, 2003).

There was an argument about the importance of supporting the activity performed by the pickers, not only in the social dimension by generating work and income, but also as to the ecological and economic dimensions. The importance of pickers in promoting recycling was underlined, and that recycling in turn helps reduce soil and river contamination, and increases the work life of sanitary landfills, which is one of the great urban problems due to lack of space and the high price of solid waste disposal. The ecological importance of the work they do was highlighted in the narratives of all pickers interviewed, as well as the new meanings assigned to garbage.

> *Nobody cared about the environment, this business of recyclables nobody knew either, it was not that important, you didn't hear talk about it [...] 20 years ago, let's say, you didn't hear all this talk about recyclable material, not like today, you didn 't hear talk about it, I didn't even hear what recyclable material was or know what this was.* (ASMARE PICKER)

This new significance ascribed to garbage, which becomes recyclable, based on a resemantization process, is then an argument to support the importance of the pickers' work. Resemantization is the process of ascribing

positive, useful connotations so that garbage begins to be considered an object of value, not only by the pickers, but also by other segments of society (CARMO, 2008). For Carmo (2008), the positiveness ascribed to garbage is what allowed both the pickers to "emerge" and the proposal of policies to encourage their work. Although the pickers subsisted on garbage long before it was considered recyclable, they were only recognized by the State at the time when recyclimg began to be disseminated in society.

However, it should be emphasized that the policy developed in Belo Horizonte did not necessarily occur due to the resemanticization of garbage, since the dynamics of the pickers' struggle, stimulated and constructed from the work of the Street Pastoral, was the base for the demand for a policy to support the work of this group, as shown previously in detail.

In the initial years, *Asmare* developed a structure and grew. The number of members in 1993 was 31; it became 156 in 1994, 183 in 1995 and 210 in 1997 (JACOBI; TEIXEIRA, 1997). A former social mobilization analyst narrated that, during this period, the degree of integration with the public authority was so great that the Street Pastoral had the idea of creating a collegial management of *Asmare*, in which agents of the Pastoral, *Caritas*, members of *SLU* and SMDS participated to contribute to the technical-operational management of the association. This relationship continued in the next administration of the city of Belo Horizonte.

Célio de Castro (PSB), who had been vice-mayor in the previous terms, won the elections in 1996. The new administration continued the policy developed at *SLU*, which included the selective collection program.

A fomer social mobilization analyst told that in Celio de Castro's administration (1997-2000), the *SLU* superintendent was someone else because of political issues connected to bargains struck between the parties in the coalition. But the mayor imposed the condition that the entire *SLU* team should continue, despite the change of superintendent, and this was done. The former coordinator of the selective collection program also told that a public exam was carried out for a few jobs. The fact that the team was maintained, including actual jobs and personal apppointments to positions of trust helped continue the work. The former social mobilization analyst also emphasizes that although no more investments were made, everything that had been done was continued.

During this period, on the national level, the issue of pickers began to gain public repercussion, mainly when the National Forum of Garbage and Citizenship [*FNL - Fórum Nacional Lixo e Cidadania*] was founded in 1998,

on the initiative of the United Nations Children's Fund (UNICEF). The former superintendent of urban cleaning during the Patrus Ananias administration (1993-1996) was one of the people who founded the Forum and the National Program of Garbage and Citizenship as a UNICEF projects officer. The former coordinator of the selective collection program during the same administration also went to work in the National Program on Garbage and Citizenship.

In general, these are the main aspects discussed in the narratives, portraying this period. It should be noted that in all narratives a transformation is emphasied, beginning during the Workers' Party (PT) administration of Patrus Ananias (1993-1996): passing from a situation in which pickers were seen as social outcasts and "enemies of urban cleanness", to another, in which they began to be considered workers and "priority agents" of the selective collection program.

Another fundamental aspect that could be noted in the narratives were the feelings that led to the construction of the selective collection program and that were simultaneously reinforced and reconstructed. The Street Pastoral, as a base and stimulating factor of the pickers' organization, sought to create new feelings about the pickers and their work, emphasizing social injustice and the ecological function of the work they do. These same feelings, present in the dynamics of the pickers' organization are present in the narratives about the actions of construction of the selective collection program. To a certain extent this was because people who initially supported the pickers began to occupy important positions in Local Government, such as the mayor, and especially the superintendent of urban cleaning. But also because the construction of the selective collection program was a participatory and joint process, between the public authorities, the Street Pastoral, *Caritas* and *Asmare*. This municipal administration appears to have been characterized by the opening to civil society and by the construction of projects aimed at marginalized social groups. In addition to these elements there is the public repercussion of the environmental issue, especially since the Earth Summit 1992 (ECO-92) was held in Brazil in 1992.

On the other hand, the feelings that guided the elaboration of the selective collection program were reinforced, in a continuous process of construction and reconstruction, with implications also for the dynamics of the pickers' organization. When the pickers were formalized as priority agents in selective collection, it was stressed that they were not beggars, nor social outcasts, but workers in a precarious situation. In this process, new meanings were also reinforced in the workers' everyday life, around their social and working conditions, which strengthened the group in its struggles.

-POLITICAL AND SOCIAL CONSEQUENCES: DISSEMINATION FO THE EXPERIENCE AND CONSTRUCTION OF NEW SPACES FOR POLITICAL ARTICULATION (1999-2004)

In 1999 the Street Pastoral and *Asmare* began to be asked to disseminate their experience of organizing pickers to other municipalities. A former pastoral agent told that this demand began mainly with the National Program of Garbage and Citizenship, in the campaign, *"Never again, children in the garbage dump"*. She told that, at the time, it was the technicians of the Pastoral who worked at *Asmare* who did this work of supporting the pickers' organization. The pastoral agents helped run the association and performed training activities with the pickers. She told that they began to discuss the possibility of doing this work, but they found it complicated because the Street Pastoral worked in Belo Horizonte, and did not have a legal organization that would allow it to expand its work. The former pastoral agent told that, in conversation with the diocesan archbishop, he advised them to create a new organization to be more independent.

Thus, in 2001, they created the Nenuca Institute of Sustainable Development [*INSEA- Instituto Nenuca de Desenvolvimento Sustentável*] and the pastoral agents who worked at *Asmare* slowly left the association. In 2002 *Asmare* began to be managed by the pickers themselves, but with administrative employees paid for by an agreement with the city administration

The first actions for dissemination occurred in 1999, still through the Street Pastoral together with *Asmare*. A pilot consultancy was performed within the sphere of the National Program for Garbage and Citizenship in the municipalities of Brumadinho and Ibirité, in the Metropolitan region of Belo Horizonte. The goal was to eradicate child labor in the garbage dumps of these municipalities. In the year 2000 consultancy action had already been extended to 14 cities in Minas Gerais and to 33 at the end of 2001, but already through INSEA.

The Pastoral coordinator told that they perceived that *Asmare* could not remain isolated in Belo Horizonte and they began work to strengthen the pickers' organizations in the state and also in the country. She considers *Asmare*'s contributions important in this process. Since it is a larger group, they were able to take this experience of organization to other places. The coordinator told that the Street Pastoral tried to show the precarious

and poor situation under which the pickers live, not only on the streets, but also in garbage dumps all over the country.

During this period, *Asmare* was a reference for the state of Minas Gerais and it was gaining national and international repercussion. The association and the selective collection program of Belo Horizonte received several awards and honors. The awards became a way to reinforce the importance of the work developed in Belo Horizonte and, at the same time, it reinforced the feelings about the social value of pickers and the work done by this group. This may be seen as a contribution for pickers not to be a priori devalued in their interactions. The awards have a significant symbolic value, interfering in the daily life of the pickers, as a female picker from *Asmare* tells:

> *Now we can go to the shops and buy. Now we are recognized: Ah, you work in Asmare", Ah, I've already seen you on TV", "I've seen you parading during your carnival". "I've already seen the interview of your sister who went to the United Nations in the USA, she received the award of woman of the year in Claudia magazine". That is when everyone recognized us as workers, that is when we became able to buy in the shops. right? We can have a bank card, which we didn't before, drugstore... So people began recognizing us, and now we are recognized, now as workers, but formerly we suffered discrimination, the population didn't recognize this as work* (FEMALE PICKERS, A FOUNDER OS ASMARE)

This utterance has a wealth of meanings. One of them is the symbolic importance of these award in recognizing the pickers' work, interfering in everyday life and, at the same time showing the tensions between the disrespect encountered and social recognition (HONNETH, 2003). Another interesting aspect was to highlight the " being able to go into the shops and buy", which was also underlined in the narratives of other pickers interviewed. Previously, the entrance of pickers in various commercial establishments like those mentioned by the woman was not allowed. Even when they had money and wanted to buy, for instance, food in some fast food place downtown, the establishments refused to sell, such was the discrimination and the disrespect. Thus, "being able to go into the shops and buy", has a greater meaning for the pickers than simply consuming.

Her sister, who was honored twice, as cited in her narrative, reported in a spontaneous conversation that, before, in schools, her son was the son of a "woman who picked garbage', and after she went to the United Nations, he became the son of the "woman who went to the United Nations." When she told this in the conversation, she immediately asked "why did I have to go to the

United Nations to become of some account? ". This utterance is very interesting, insofar as it questions the denial of social recognition.

During this period also the formation process of *MNCR* began. The Pastoral coordinator tells that through the National Forum of Studies on the Street Population, of which she is part, they initially articulated groups from Minas Gerais, São Paulo, Porto Alegre and Rio de Janero. She reports that they began with limited meetings, then they broadened them, holding various meetings until, in 1999, they held the 1st National Meeting of Pickers in Belo Horizonte, at which they already planned the 1st National Congress of Pickers in Brasilia. The coordinator tells that the constitution of the national movement in 2001 was the high point, since:

> *When they realize that they are not alone, that this reality is not exclusive to Belo Horizonte, nor to Minas, that this is in Brazil, it can strengthen their struggle. SO also opened the meetign with other social movemetns, that gradually perceive it. I think that it is this pedagogy, this work that will show, see, and the result of believing in protagonism, I think that believing they are capable and that they go beyond this.* (Coordinator of the Street Pastoral)

It is interesting to note in this utterance some aspects of the methodology used in the organization process of the pickers of *Asmare*, and their relationship with the national movement.., such as *"when they realize that they are not alone, that this reality is not exclusive to Belo Horizonte"*, and *"believing in protagonism"*. This pedagogy may be seen as a way of trying to show pickers that the disrespect that they suffer individually affects many other people.

In an attempt to broaden *Asmare*'s actions, in 2001 the *Reciclo Espaço Cultural*, a cultural space, was created. It was a bar where samba shows, talks and other cultural activities were held, in which former street people were inserted professionally. A former pastoral agent told that the idea of this bar was to provide a space for dialogue with society, perform cultural activities, disseminate the importance of recycling and of the pickers' work, besides generating work for former street people. Objects made of recyclable materials produced in the *Asmare* workshops were also sold in in this space. Reciclo, like the Pickers' Carnival, can be considered a symbolic mechanism for the social valuation of the pickers and their work. However, in 2009, the space was closed because the number of customers diminished and due to financial problems.

In the justifications given about this event, a female picker pointed out that "Reciclo closed because, just as we work with the public, we work with the street population, right, and they are not prepared for the market. We bet

on Reciclo and there people are not prepared for the market." It is interesting to observe that they blame the street people for the fact that the bar closed. Already in a spontaneous conversation after an interview was interrupted, one can see how another picker talks contemptuously about the street people:

> **PICKER:** *They are giving houses to all those bums" bums is justa way of saying it, see? Because as soon as the World Cup is over, these things, they'll sell everything, exchange everything for alcohol, and go back into the street. We who need it don't get something like that.*
> **FEMALE PICKER:** *The World Cup is really catching the street people. People go and live on the streets for several situations, everyone has a situation.*
> **PICKER:** *Or more, one of thesebuildings for the street people, I already think that they knew they are going to sell it. When would the street people be clean to live in a building?*
> **FEMALE PICKER:** *Pay common expenses, water and light, see?*
> **PICKER:** *They don't like cleanliness.*
> **FEMALE PICKER:** *But there are many people that I know who went to an apartment and are doing Ok.*
> **PICKER:** *I am talking about the bumbss.*
> **FEMALE PICKER:** *But these bums don't go to an apartment now, they go first to the center of reference.*
> **PICKER:** *But they are already taking them, they are all already at Barreiro and Santa Maria. Outside it is goingto look fine, but inside I can tell you for sure that there will even be those huge female rats. Those people are real pigs!*

In this conversation it is clear that he is speaking contemptuously about the other, to reaffirm his own value. As Souza (2009) argues, the construction of self-esteem, to some extent at least, often occurs in contraposition to the members of the same social class, distinguish oneself based on the "stigma" of delinquency. This stigma is accepted based on an inarticulate social consensus which arbitrarily imposes the notion of delinquency associated with those who compose the structural very low class (SOUZA, 2009).

Besides Reciclo, another action seeking to strengthen *Asmare* was the process of forming a joint networkd for commercialization and opening a factory to process plastics. From 2002 onwards, INSEA and *Asmare* began to hold meetings among eight pickers' associations and cooperatives in the state of Minas Gerais to attempt to form a network. The intention was to build joint alternatives for the difficulties faced by the associations

and cooperatives, such as improving the commercialization process and adding value to the recyclables.

In the narratives that portray this period, the new meanings that are constructed and reconstructed can be observed. The focus was no longer the internal organization of *Asmare*, as in the previous phase, but the development of external actions. Along these lines we can highlight Reciclo and actions that go beyond the borders of the municipality. Accompanying the changes on a national scale, especially those started by FNLC, the activity of disseminating experience to other municipalites of Minas Gerais began. Simultaneously, the idea of articulating the Brazilian pickers began to grow, culminating in founding the *MNCR*, which required efforts, as in other regions, the mobilization of pickers in several cities. Other ideas that grew stronger were creating joint commercialization networks and adding value in some production chains, which was configured, concretely, by the project of building a factory to process plastics. In this way, the action of the Street Pastoral and of *Asmare* began to concentrate efforts on a new focus, beyond the local sphere. However, during this period changes in the local sphere began to occur, which affected the relationship between the public authorities and *Asmare*, as detailed below.

//CHANGES IN THE LOCAL SPHERE AND THEIR IMPLICATIONS IN THE RELATIONSHIP BETWEEN THE PUBLIC AUTHORITIES AND ASMARE//

In the municipal sphere, in the elections of the year 2000, Célio de Castro (PSB) was re-elected mayor of Belo Horizonte. However, in 2001, for health reasons, the mayor left his position and Fernando Pimentel (PT), his vice-mayor became interim mayor, in November of that year, but remained until the end of the term because of health problems that made Célio de Castro retire.

Among the main changes told in this period is the administrative reform implemented in 2001, aiming to decentralize the City Administration of Belo Horizonte (Lei nº 1284 of 12/30/2000). This reform had strong implications for the *SLU*, and in turn for the selective collection program. *SLU* was no longer an autarchy and became the Municipal Department of Urban Cleaning (*Secretaria Municipal de Limpeza Urbana* [*SMLU*]), and regional sub-departments were established. The narratives of the *SLU* employees who worked

during this period converge to the perception that the reform was a mistake that ultimately destructured the *SLU*. A former social mobilization analyst told that *SLU* already acted in a decentralized manner from the technical-operational point of view. The autarchy had the central unit that coordinated and performed planning, and the cleaning divisions that carried out the operational activities. The former analyst reported that the reform was top down, without considering the way the superintendency worked and without consul-ting anyone. She also highlighted that, with the reform, the performance and capacity of the *SLU* was reduced in terms of coordination of the solid waste management policy.

During this period there was great dissatisfaction among the employees and many left the agency. The former social mobilization analyst summed up the situation of the *SLU* as follows:

> *"today the SLU lives on a fame that was planted in the previous two administrations [Patrus Ananias (1993-1996) and Célio de Castro (1997-2000), and continues to provide a service, but it is much less than it did before".*

She also told that in this process a distance was created between it and *Asmare*, and a few conflicts occurred that affected the selective collection program.

During this period relations between the public authority and *Asmare* were weakened, compared to the previous period. At the same time, the *SLU* began to be visited by other pickers' associations and cooperatives that began to be established in Belo Horizonte, from 2000 onwards. A technical adviser of the *SLU* told that the *PBH* Management of Economic and Social Development [Gerência de Desenvolvimento Econômico e Social] which no longer exists, within a policy of work and income generation, enouraged creating work cooperatives in each regional section of Belo Horizonte. This management encouraged establishing mainly recycling cooperatives, but did not enter a dialogue with the *SLU*. However, a short while later it denied any responsibility. According to the adviser, this was an action that was completely disarticulated from the *SLU*'s program of selective collection.

The current head of the Department of Special Programs of *SLU* told that the new associations and cooperatives began to visit *SLU* asking for support to set up the structure of work and recyclable materials of the selective collection program. These new associations and cooperatives comprised a different public from that of *Asmare*, mainly the unemployed and women's groups, some connected to neighborhood associations and housing movements.

In this context, with more asssociations and cooperatives, in 2002 the *SLU* began the modality of selective collection door to door, ie, the population separates the materials at home and, every week, at a pre-established time, the materials are picked up. From 2003 onwards they implemented the collection in a few more neighborhoods using *SLU* trucks specifically for this purpose (SLU, 2009).

At the end of 2003, discussions and meetings began to create the Municipal Forum of Garbage and Citizenship of Belo Horizonte [*FMLC-BH Fórum Municipal Lixo e Cidadania de Belo Horizonte*], which became official in 2004. Organizions linked to this topic, local government authorities and all associations and cooperatives of pickers odf the municipality including *Asmare*, became members of the forum.

The technical advisor of *SLU*, currently responsible for coordinating the FMLC-BH, told that the forum organization made these other associations and cooperatives that exist in Belo Horioznte relevant. But she emphasized that Asmare hardly ever participates in the meetings, only when there is a specific interest, since ther is a conflict. For Asmare the forum does not represent the historical pickers, but groups of unemployed people. The current head of the department of special programs told that there is a dispute between *Asmare* and the other pickers' associations and cooperatives in the city. This began when *SLU* started sending recyclable materials that were previously sent to Asmare, to the other seven associations. She said that there is a rivalry between historical and non-historical pickers, the latter entered the acdtivity reacently due to unemployment.

On the other hand, the former member of *Caritas* told that the lower government authorities ignored the pickers who had not yet organized themselves, who work in warehouses, and began to create "associations of unemployed". According to him they did not include *Asmare*. They said that the association did not accept the selective collection program because "it wanted everything for itself". He also reported that two groups were established, on the one hand the organized pickers of *Asmare* with the non-organized ones, and on the other the associations created by the city Administration that, he pointed out, were created to justify outsourcing the work to the private sector, that was about to begin. The former member of *Caritas* told that the FMLC-BH became a mechanism to legitimize the actions of the local public government so that they stopped participating in the municipal forum.

It is interesting to observe the existence of a dispute between *Asmare* and the associations and cooperatives of recyclable materials founded more recen-

tly in Belo Horizonte. There is a competition between them to the detriment of solidary ties among them. It seems that there is a competition for access to given material and symbolic goods, by differentiationg between historical and non-historical pickers. The two groups participate in different networks, *Cataunidos* and Redesol, respectively. Redesol and its members are not connected to *MNCR*. On the other hand, the two groups have different political articulations, supporters and access to government resources. This is an interesting contradiction of this process, since there is a dispute between groups in a situation of social inequality that comprise a same social class that is devoid of the social pre-conditions to obtain anyu form of social recognition (SOUZA, 2009).

The events recounted above were the beginning of other changes that came in the following years and in turn led to new conflicts in the realtiosnhip between public authority and Asmare, as detailed in the next topic.

ADVANCES IN THE NATIONAL SPHERE VERSUS INFLECTIONS IN THE LOCAL SPHERE (2005-2010)

In 2005 new conflicts began between Asmare and the local authorities. In the 2004 elections,, Fernando Pimentel (PT) was re-elected mayor of Belo Horioznte. During his administration there were changes in the structure of the selective collection program and new conflicts in the relationship with the pickers.

The main events of this narrative were the interdiction of the shed that was the headquarters o fAsmare, the outsourcing of selective collection services and a decree that regulated the picking activity, with rules, such as at what time the pickers could go on the streets with their handcarts.

The interdiction of *Asmare*, which occurred in July 2006, was an event narrated especially by the pickers and former members of the Pastoral and Cáritas. The former member of *Caritas* told that the inspectors of the *Regional Centro Sul* (Center South Region) of the *PBH* and the military police came to interdict *Asmare* because there was lack of fire fighting equipment. He argued that, indeed, the association did not have a system against fires, but that the shed was built and delivered by the city administration without this structure. He reported that they removed the interdiction of *Asmare* and formed groups to guard it during the night, in order to avoid any accident. Later they installed the equipment and reopened officially, but he emphasized until this day the city

administration refuses a licence to operate. The former member of *Caritas* considered that this was done on purpose by the BH city administration, since at the time the conflict were becoming worse because of the outsourcing of selective collecdtion services.

Outsourcing of the selective collection services, carried out in 2007, was another event considered markedly important. A picker from *Asmare*, a current leader of the *MNCR*, told that they held several demonstrations and protest marches against outsourcing, and that it was a very difficult period. Many feared that picking on the streets would no longer be feasible because of outsorcing. In almost all narratives the conflict that occurred between *Asmare*, *MNCR* and *PBH* is highlighted, but the feelings attributer to the event diverge.

On the one hand, especially by some of the public authorities, the outsourcing of selective collection occurred both because of the operational incapacity of *SLU*, and because of the incapacity of the pickers organizations of performing door to door collection. One of the coordinators of the selective collection program told that the person who was then a superintendent chose outsourcing, arguing that the *SLU* did not have the capacity to perform door to door collection, and nor did the pickers' associations.

On the other hand, in some narratives, outsourcing was seen as a form

of predominance of the interests of "large capital". in an attempt to exclude the pickers from the process, ie. to take their source o fsurvival away s from this group. These feelings were present in the narratives of the Pastoral coordinator, a former pastoral agent, the picker who is a leader of *MNCR* and, especially, in that of the former member of *Caritas*. The latter told that outsourcing of the conventional and selective collection services, was legitimized based on a strategy that had begun before, namely, the administrative reform the provoked the dismantling of *SLU*, and reduced its capacity to provide services. He reported that, at the same time as this process, *Asmare* was abandoned by the public authorities who adopted another strategy to justify the outsourcing model, which was to create other associations and cooperatives, without taking the non-organized pickers of the storehouses into account. The former member of *Caritas* pointed out that the outsourcing of the collection services in Belo Horizonte occurred insofar as the predominance of big capital interests predominated, in a market that begins to arouse the interest of other segments with greater economic and political power, which, according to him might explain the dismantling of the *SLU*, which was recognized nationally and internationally for the quality of its services.

When outsourcing began in 2007, the company employed began to collect door to door in 21 neighborhoods. On the other hand, *SLU*, with its

own resources, performs collection in nine neighborhoods. Thus, only 30 neighborhoods are included out of a total of 148 in Belo Horizonte. One of the coordinators of the selective collection program emphasizes that *"we play at performing selective collection"*, because the number of neighborhoods covered and the percentage of what is recycled, compared to the total amoutn of solids wastes generated in the municipality is very small. In 2009, only 0.8% of the total amount of solid wastes generated in the city were sent to recycling based on the selective collection program (SLU, 2009).

Another event narrated by the pickers and by the former pastoral agents was the creation of a decree that regulated the waste picking activity in the municipality. The former member o *Caritas* told that when this decree was drafted, there was no participation of pickers or any other organization of civil society involved in that subject. Among the rules, it established that picking on the streets would only be allowed between 7:30 p.m. and 7 a.m., arguing that the presence of the pickers on the streets was a problem for traffic. He told that this action was a strategy of the city administration, associated with the outsourcing process, since by creating this schedule, when the picker came by the material would already have been picked, and that therefore they would give up, because they could not find any more material. The former member of *Caritas* told that they went to the storehouses, talked with the non-organized pickers and held joint demonstrations and mobilizations against the decree. They sought support at the MP-MG, which required that the city administration rewrite the decree with a task force including the presence of pickers, supporting organizations, MP-MG and the city administration. In this way the decree was completely reconstructed and published in 2008, at the end of the Pimentel administration.

The Fernando Pimentel administration (2002-2008), including the period in which he replaced Célio de Castro, was pointed out, in all narratives, as a time when new conflicts began between *Asmare* and the public authorities, especially the three events mentioned above. Some of the interviewees also mentioned other actions and events, reinforcing this perspective. The former member of *Caritas* told that the *SMAAs* did much less work, reducing the approach to the street people and that there were more inspections, especially with the process of revitalizing the squares in the central region He highlighted that there began to be a return of the more camouflaged repression actions, often criminalizing the street people and the pickers. This was also supported in the narratives of some pickers. One picker from *Asmare*, for instance, told that the inspection actions returned and persecution of the pickers, that the inspectors took away the carts on the streets, but there is a scheme:"they take them away at that

corners, we go and fetch them there, they return it without paying any fine, or anything else.

IT should be noted that the actions of repression to the pickers word returned. Although these actions are not as extreme as before, as in the case of “operations clean up.”, they are no less harmful tothe physical and social integrity and to the dignity of the pickers. The disrepsect continued, with deprivation of rights, degradation and insults, and even physical assaultss, as told in the event of the interdiction of the shed that is the headquarters of *Asmare*.

It is interesting to note, in the narratives of some pickers, members of support organizations and former and current employees of *SLU*, that during this period the public authorities went from being a “supporter” of *Asmare*, back to beoming an “enemy”, but with a different connotation frkom that ascribed until 1993.

The narratives of the picker who is currently a leader of the *MNCR*, the coordinator of the Pastoral, the former Pastoral agent and the former members of *Caritas* agree in the perceptiont hat local public authorities on ce again had become the main” enemy”, as their concept of garbage managemetn changes, especially with the outsourcing of services. The former represntative of *Caritas* emphasized that *“[...] our enemy is not thaa fellow who is the middleman, our great enemy is the one who wants to take it from all of this chain and give it to big industry, to big firms, I mean, the urban clean up service”*.

On the other hand, the narratives of a former and a current employee of *SLU* show this change in relation to the public authority, which again becomes gthe “enemy” from other perspectives. The current head of the Department of Special Programs of *SLU* told that, after the Patrus aAnanias Adminstration (1993-1996) there wee no further investments and incentives for the selective collection program. She underlined that it was all “blood of the *SLU* employees” with the redirection of resources and “flexibility” to keep up the program. And yet, those who always supported and defended the pickers, ie, the technicians, are now considered enemies by the pickers. But the fomer analyst of social mob ilization of *SLU* told that whent eh pickers began to think about a national movement, they stepped up a discourse against the government, which she considered a good thing to bring togegther the members of a social movement. She emphsaized that this led to a sharper discourse in favor of *Asmare* autonomy, which contrib uted to create dissatisfaction within the government, because it was not even recognized that they were doing their share. During this period in which the conflicts with the *PBH* became sharpers, one continued to try to increase the ction of *Asmare* and the possibilities

of income generation. In 2005, *Reciclo II Espaço Cultural* was inaugurated, following the same concept as the previous projecdt, Reciclo I. But instead of a bar, a restaurant was set up, where the arts and crafts produced in the recycling workshops of *Asmare* are also sold. In this space the former street people work, as waiters, kitchen helper and.servers. (atendentes). Another thing that happened was the formalization of the network of assocaitons and cooperatives of pickers, begun in 2002. That is whent eh Recycling Cooperative of the Pickers of the Solidarity Eocnomy Network [*Cataunidos – Cooperativa de Reciclagem dos Catadores da Rede de Economia Solidária*] wa formed in 2006.

During this perid the construction of the plastics processing unit of the network began. The purpose was to proces the plastic collected b y the nine association of *Cataunidos*, in order to add value to the material collected and eliminate the middleman, generating greater income for the pickers. In 2007, the industrial unit[9] was undergoing tests and began to operate in 2008. However, several prob lems and difficulties occurred (RUTKOWSKI, 2008)[10]. In 2009 the factory activities were interupted and it is closed. Some pickers and former pastoral agents told that the factory is closed due to lack of working capital and for other problems of operation and management. Through *Cataunidos* they also started the joint sale of recyclable materials, but there were problems and it is no longer done (RUTKOWSKI, 2008).

CURRENT CHALLENGES AND NEW INFLECTIONS IN THE DEVELOPMENT OF THE POLICY TO SUPPORT THE WORK OF PICKERS IN BELO HORIZONTE.

Márcio Lacerda (PSB) was elected mayor of Belo Horizonte in the 2008 elections. As to his administraiton, in terms of the selective collection program, the narratives of the Pastoral coordinator, of the member of INSE, the former member of Cáritas, three pickers from *Asmare*, and current workers of *SLU* converged. One female picker and the former member of *Caritas* told that, in a meeting discussing the selective collection program, the current mayor made

9 The Cataunidos factory has a capacity to process 350 kg per hour, and the end product generated, the pellet, is a granulated plastic that is used to make new products. This factory was the first picker enterprise of this kind in Latin America.

10 For further details about the formation of the Cataunidos network and the plastics processing factory, their problems and difficulties, consult Rutkowski (2008).

it clear that he was going to continue the program, but that between a clean city and the selective collection, priority would be given to a clean city through conventional collection. He made it clear that he does not intend to invest in the selective collection program. One of the coordinators of the selective collection program reported that the current mayor's concept is very economicist, because for him it would be better to pay the picker to stay home than invest in selective collection. Another coordinator of the program, in turn, pointed out that most of the associations and cooperatives that are members of the program do not send *SLU* the data concerning the amount of recyclable materials collected and sorted, so that they do not have data to argue with the mayor.

Currently the relationship between *Asmare* and *PBH* consists of the agreement established since 1993, which is part of the sphere of *SMAAS*, with a transfer of financial resources to pay employees in the adminsitrative sector of the shed that is the HQ, and to supply uniforms and transport vouchers to the pickers. Currently *Asmare* has 250 members.

It is important to highlight that the structure of *Asmare* and the working conditions of the pickers are still very precarious. The two sheds belonging to the association have divisions of areas to perform sorting, but do not have counters so that the pickers improvise structures for support when they are sorting the materials. The *Asmare* main shed could now be described as a space full of rats, with wastes to be sent to the sanitary landfill, scattered around the floor, and an unbearable smell, indeed a female picker said that *"there are days when one can't even eat because of the smell of dead rat"*. The state of disorganization of the shed was the subject of complaints by the pickers in several conversations in which they recalled the time when there was a joint effort to clean and organize the space.

In the Shed HQ most of the pickers go out every day with their handcarts to fetch materials, returning to *Asmare* with the carts full and a lot of weight, which are unloaded the next day. As to the income generated for each member, the pickers complain that it has gone down a lot, because of the low prices of the recyclable materials, especially in the last two years. The prices of recyclables fluctuate a lot, going down in some periods, as in 2008, since the prices fluctuate according to the market conditions, now that garbage has become an object of value (CARMO, 2008). after the recyclables are sorted, pressed and placed in bales they are sold to two large storage places in Belo Horizonte. Even after *Cataunidos* was founded, it was not possible to perform joint sales to the industry. In addition, there has been a reduction of recyclable materials available to the pickers. The *Asmare* administrator told that companies that used to donate small cans to the association no longer

donate, and neither do other donors of different materials. She also reported that the quality and quantity of the material that reaches the shed has been steadily diminishing. This fact was also mentioned by the members, as one woman picker pointed out *"a time is coming when there will be no more recycling [...] because now people are discovering what recyclable material is, and they are using it themselves, see?"*. The reduction of the recyclable materials available to the pickers is one of the results of the social enhancement of garbage, that arouses the interest of other segments of society, as pointed out by Carmo (2008).

Considering the difficulties and the problems mentioned above, it is interesting to see the current demands presented in the pickers' narratives. One of them, emphasized mainly by the elderly pickers is retirement, as one woman said; *"now the question is retiring. I have been working since I was a child. Now I am 60 years old and I have never paid INSS [contribution to the National Institute of Social Security]"* The picker also emphasized that they are fighting for this. It should be highlighted that there is a law bill for the differentiated retirement of pickers, in an initiative by *FELC-MG*. This demand, in turn, is related to the refusal of legal acknowledgement.

Another demand pointed out, but only by a female picker who is a leader of *Asmare* and by a picker who is now a leader of *MNCR* is payment for services rendered by the pickers, from the local public authorities, as allowed by Law nº11,445/07. Two other most often cited demands are the need for greater access to recyclable materials, which has gone down, and the matter of commercializing and the low sales price of the material.

In general, this is the present situation of *Asmare*. As can be noted, the working conditions of the pickers are still precarious. After the advances achieved in the 1990s, there was no significant change in this aspect. The pickers are still pulling handcarts, the sorting is done in sheds without an appropriate structure, income is still low and susceptible to the fluctuations of the recyclables market, and the materials continue to be sold to middlemen. Even though several changes and attempts at improvement have occurred over these years, working conditions continued to be the same.

Besides, it is important to point out that at the same time as advances on a national level, there was evidence of an inflection in the policy of support to the pickers' work in Belo Horizonte. From the 2000s onwards, considerable advances occurred on a national level. One of the first conquests, already in the Fernando Henrique Cardoso Administration, was the acknowledgement, in 2002, of the occupation "picker of recyclable material", by the Brazilian Code of Occupations [*CBO – Código Brasileiro de Ocupações*].

Recognizing the occupation in the CBO had a symbolic function and gave public visibility to the pickers. In 2003, already in the Lula Administration, by presidential decree, the Interministerial Committee of Social Inclusion of Recyclable Material Pickers [*Comitê Interministerial de Inclusão Social de Catadores de Materiais Recicláveis*] was created. In 2006, decree 5,940 was published which foresees that all public offices of the direct or indirect administration should perform selective collection and donate the materials to pickers' cooperatives. Through Law 11,445/07, which alters the National Sanitation Policy, public administrations were allowed to employ organizations of recyclable materials pickers to provide selective collection services without needing to perform bidding. In turn, within the MDS, actions to support the pickers began to be implemented, connected to social and productive inclusion. Another advance on the federal level was the approval, in 2010, of the National Policy of Solid Wastes (Law nr. nº 12,305), which foresees the insertion of pickers into municipal selective collection programs, as a requirement of the Plan of Integrated Management of Solid Wastes to be elaborated by all municipalities.

But in Belo Horizonte, in parallel, there were evident difficulties in developing the policy constructed in the 1990s. From 2001 on, there were inflections in the policy on pickers and the relationship between *Asmare* and the local public authorities compared to the relationship established previously in the Patrus Ananias (1993-1996) and Célio de Castro (1997-2000) administrations. This process began with the administrative reform of the *PBH*, which destructured the *SLU* and in turn affected the selective collection program. In Fernando Pimentel's administration (2002-2008) it was characterized by actions that sharpened the conflicts between pickers and the public autorities, such as outsourcing the selective collection services and the decree determining at what times the pickers could circulate with their handcarts, Also, the selective collection program has very low results, as mentioned previously, even if services are outsourced, The amount collected is very small compared to the amount of solid wastes generated in the municipality.

It is observed that even with a stronger *MNCR* and considerable achievements on the national level, such as the federal policies to support this social group, in general there have been no improvements in the everyday life of the *Asmare* pickers. On the contrary, the difficulties and challenges are many, such as those mentioned above. Likewise, even if some kind of social recognition has occurred, disrespect continues in different forms, not as extreme as before, but no less damaging.

FINAL CONSIDERATIONS

The relationship between the *Asmare* pickers and the local government involved various conflicts in a process full of comings and goings, from 1987 to 2010. During this period changes occurred in the senses and meanings attributed to the pickers and to the work they perform, generating repercussions in the struggle of the pickers and in the state's response to the public problem.

The process of constructing the policy of support to the pickers in Belo Horizonte occurred due to the pressure of the pickers themselves, organized in an association with the support of the Street Pastoral. The policy in the 1990s was cosntructed "with" the pickers, so that this participation in the construction and implementation of the policy was one of the elements that allowed successful results in the initial years. The policy tried to incorporate and promote social recognition of the pickers in a dynamics marked by the constant tension between disrespect and recognition. Some advances were achieved, although the pickers still are in a situation of refused recognition, suffering different forms of disrespect. We observed that when there was an inflection in politics in the mid-2000s, there ws no longer a participation of pickers in implementing the policy with the same intensity as in previous years, and also the priorities were redefined with the changes in government.

The changes in government showed how fragile the policy to support the pickers' work in Belo Horizonte still is. This can show the influence of people and, in turn, the low institutionalization of effective policies. It is important to point out that the institutionalization of policies in itself does not guarantee legal recognition, or any other form of recognition, but it is an important element to allow mainly access to rights, considering the high social inequality in Brazil. *Asmare*, with a network of supporters and public recognition, has a political force that certainly contributed to the continuity of government action, despite the inflection and regression in some aspects of public policy beginning in the 2000s.

On the other hand, it is important to mention that at the end of the years 2000, the struggle of the *Asmare* pickers lost strength in some aspects, as a counterpart to the greater strengthening of the national struggle through *MNCR*. Some forms of interaction, which reinforced the struggle, such as parties, meetings which were held quite frequently at *Asmare* no longer take place. Although, when *MNCR* was formed, new spaces were created for meetings among pickers from the entire country, most of the *Asmare* pickers have not participated in the events of the last few years. The national movement is something distant for most of the *Asmare* pickers in their daily life.

Based on the interviews and spontaneous conversations, it was noticeable that most know practically nothing about the *MNCR*, and that they no longer participate in meetings of the national movement, or even of the Festival of Garbage and Citizenship held annually in Belo Horizonte. As to the latter event, a female picker told that they cannot stop working for a week, or even for a few days to participate in the festival, since their income is very low. She emphasizes that: *"if we work, we eat, if we don't work, we don't eat"*. Besides, some mechanisms that were symbols of the struggle, slowly lost people and, in turn, their meanings, such as the end of the Pickers' Carnival in 2006, and when Recycle I Bar closed in 2009.

It should still be mentioned that, as garbage became an object of value and a new field of business, it began to arouse the interest of other segment of society with greater economic and political resources. This was denoted by the outsourcing process of selective collection, in which the relationship between the local public authority and the pickers changed, and new conflicts arose.

It is important to underline that the pickers continue to suffer from different types of disrespect, but it appears that some meanings help prevent the a priori devaluing of them, such as the attention given to the environmental importance of the work they do. Furthermore, when they became involved through the association, the pickers were able to perceive their social value and gain back some of their self-confidence, self-esteem and self respect that they had lost. Although Honneth (2003) argues that only refusal of legal recognition and social esteem may present the conditions to begin social conflicts, in the case analyzed it appears to be impossible to separate the sphere of emotional dedication with the corresponding disrespect (physical abuse) from the other spheres of recognition. The pickers' struggle involved questioning the three forms of disrespect, namely: physical aggression that occurred during "clean up operations"; deprivation of basic rights and social exclusion, such as the denial of the rights to work, to food and to housing; and degradation and insults that occurred thorugh prejudices and humiliations.

In this study we attempted to show the importance of expanding the look toward the influence of actors of civil society in the processes of constructing public policies, and also to the social conflicts and dynamics of struggles that permeate the relations between the State and civil society in the Brazilian context. Based on the analysis of the experience of *Asmare*, we were able to observe the importance of the pickers' participation in the construction and implementation of public policies aimed at them. The successful results of the policy in the 1990s came, among other factors, from a process of joint construction. This aspect is a central element for the implementation of

the National Policy of Solid Wastes, which foresees the integration of the pickers into selective collection programs.

The study of the *Asmare* pickers' struggle revealed different possibilities for future studies, since it is goes through interesting issues that could be further looked into. One possibility would be to investigate the process by which the National Movement of Pickers was formed and the construction of federal public policies. Another possibility would be to perform comparative studies about the relationship between pickers and local governments in different Brazilian cities.

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COMMUNITY-BASED EDUCATION AND SOCIAL INCLUSION OF INFORMAL AND ORGANIZED RECYCLERS IN RESOURCE RECOVERY

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GENERATING AND FINAL DISPOSAL OF SOLID WASTES

The daily generation of a large volume of solid wastes is one of the greatest challenges of urban management worldwide. The problem begins in production: mainly when it is not managed based on ecological/social sustainability, and when it follows orientations such as programmed obsolescence or maximization of consumption, instead of being guided by the concepts of efficacy and sufficiency. Therefore, in order to solve the problems resulting from the generation of urban solid wastes, it is also necessary to redirect production and consumption. Since every citizen is a consumer, he/she is co-responsible for this problem.Thus, the solutions must also arise from the individual level, and not only from public policies, with a view to implementing the three Rs and adequate final disposal of the solid wastes. The problems require a reorganization of production and also reorientation of consumption. In order to achieve conscious consumption and the maximum recovery of the recyclable materials, it is necessary to have access to information and educational processes to create conscientization in each garbage generator regarding the need to reduce, reuse and recycle.

Few cities have a maximum recovery system for the recyclables found in the solid wastes generated daily, where this system is efficient regarding its financial cost and environmental benefit (BESEN, 2011). Therefore, to seek solutions it is necessary to focus on the production and consumption of goods and packaging, seeking to reduce the wastage of these products and materials. Wastage is considered, in general, the useless expenditure of resources for a short duration use without a new development, ie, wastage occurs when materials or products are discarded after they are used, without recovering the resources that are embedded in them.

Currently, municipal governments face serious problems with the huge generation of wastes and are under great pressure to solve their final disposal. In Brazil, with the recent National Policy of Solid Wastes [*PNRS*], Federal Law n. 12,305, of August 2010, and its regulation by Decree nr. 7,404, of December/2010, the cities will no longer be able to operate dumps and landfills that have not been sanitarily adjusted by the year 2014. Therefore municipal administrations are seeking alternatives for the final disposal of their urban waste. In this constellation, a few cities are equipping themselves for selective collection and recycling, while others are investing in incineration and, thus, in wasting the natural resources embedded in the solid wastes.

Despite the environmental dilemmas faced by cities when seeking appropriate solutions for their waste, and despite the environmental impacts created by the continued extraction of new raw materials to satisfy production and consumption, so far there are only a few solutions that meet the socioenvironmental demands. As a feasible alternative for managing urban resources, this text discusses the collection performed with organized male and female pickers[1], and the separation of these materials for reuse and recycling. Selective collection provides a large number of environmental and social benefits.

The environmental contribution of selective collection and recycling consists of several factors, the main one being the recovery of raw materials and, therefore, not causing contamination, which would occur if these materials were disposed of or incinerated, nor the production of new products extracting virgin raw materials (LARSEN, MERRILD & CHRISTENSEN, 2009; TROSCHINETZ & MIHELCIC, 2009). The use of the recyclable materials allows an economy of energy, reaching, for instance, a 5% reduction of energy consumption in recycling aluminum. This is a an important economic factor when decisions are made by industries (ABRE, 2013). Besides, there is a proven reduction in the generation of Greenhouse Gases (GHG), with the recovery and use

[1] In this text the term picker/pickers is used, referring both to male and female pickers.

of recycled materials, compared to the use of new raw materials for industrial production (KING & GUTBERLET, 2013).

The social benefit of selective collection consists in the fact that it generates jobs and benefits the local economy (GUTBERLET, 2012; VELIS ET AL., 2012; WILSON ET AL., 2009; 2006). The inclusion of pickers contributes even further to increasing social cohesion and improving quality of life in the community. The presence of the organized pickers, performing selective collection, allows increasing the cleaning and safety in the neighborhood. Often, the pickers remove recyclable materials from empty lots or from the streets. In the areas where there are sources of water, this service helps preserve the bodies of water *(BAEDER, 2009)*. These workers also contribute to expanding social communication in the neighborhood, promoting closer human relations and allowing mobilization for collective actions (GUTBERLET, 2008).

This chapter will discuss the potential of these pickers, organized in cooperatives and associations, making an effort in door-to-door selective collection, to become environmental educators or agents, promoting improved separation of the materials and a diminished generation of wastes. It is understood that over time these environmental agents will be able to perform several educational and awareness-building activities in their communities, at schools and universities, besides carrying out the tasks of collective selection. In this role, pickers can be catalysts to promote attitudes against wastage and in favor of zero garbage.

> According to the Zero Garbage Institute of Brazil [*Instituto Lixo Zero Brasil*] *"Zero Garbage is an ethical, economical, efficient and visionary goal to guide people to change their life style and adopt sustainable practices to favor the natural cycles, where all discarded materials are designed to become resources for other people to use. Zero Garbage means to design and manage products and processes to systematically avoid and eliminate the bulk and toxicity of the wastes and materials, conserving and recovering all the resources and not burning or burying them. Implementing Zero Garbage will eliminate all discharges onto land, water or air, which are a threat to the planet, to humankind, animals and vegetables"* (2013, P. 2).

This concept agrees with the commitment affirmed in the new National Policy [*PNRS*], that establishes principles, objectives, tools — even applicable economic instruments - and guidelines for integrated management and administration of the solid wastes, indicating the responsibilities of the generators, of the public authorities and of the consumers. Besides, this

law also opens many doors to include organized pickers in the management of municipal solid wastes.

Environmental education of the public at large, via the pickers, may present practical results in the sense of improving the quality of the recyclable wastes and, consequently, reducing what cannot be recycled and is considered a reject at the cooperative. Besides, the experience constructed daily by the presence of pickers on the streets may provide important reflections about solid waste management, since these agents can identify bottlenecks in the collection, and proposals to overcome them. Next, a few examples of solid waste management with pickers in Brazil will be presented, followed by empirical results on door to door collection and its pedagogical function.

SOLID WASTE MANAGEMENT AND SELECTIVE COLLECTION IN BRAZIL

The implementation of selective collection has expanded in Brazil during the last 18 years (**TABLE 1**). In 2006 the Brazilian population served by selective collection was 24 millions, while six years later it had already risen to 27 millions (CEMPRE, 2012). As to the selective collection system, most of the municipalities (88%) use the door to door alternative, with very high prices compared to the price of indifferentiated household collection – the traditional collection of municipal solid wastes (MSW) Only 53% of the B razilian cities maintain Voluntary Delivery Points (VDP) that also allow the population to participate on their own initiative. Also according to the same *CEMPRE* survey, the municipalities have different executors of the collection. In 48% of the municipalities, the city administrations perform the collection service, and over half of these municipalities (65%) work in partnership with pickers' cooperatives (ibid.).

The municipalities integrate the pickers cooperatives into their waste management system in different ways, whether it be through a contract, or in the form of specific support. The support may include constructing a sorting shed, machinery, training courses, cession of trucks and investment in environmental education.

Although they are present in the collection systems of many municipalities, the way pickers are inserted has varied according to the municipal programs. The institutional relationship has significant variations, as do the working conditions and the income obtained by these workers. One of these

discrepancies concerns payment for collection services by the city administration. The first city of Brazil to begin this payment was Diadema, at the beginning of the 2000s. Few cities made the same commitment, and the members of the cooperatives remained at the mercy of the different market fluctuations, especially in the last six years because of the world economic-financial crisis. In a situation of extreme social exclusion, the imbalance of the forces of this set of workers in the market relations is known. This situation can only be overcome if the authorities respond to the public interest. The development of projects selected in Federal Notices, for instance, is a measure that has already enabled many cooperatives to survive the economic crisis.

Year	Municípalities with Selective Collection in Brasil
1994	81
1999	135
2002	192
2004	237
2006	327
2008	405
2010	443
2012	766

TABLE 1 Municipalities with Selective Collection in Brazil. Adapted from Ciclosoft Survey, CEMPRE, 2012.

In this sense, as already mentioned previously, the new Federal Law nr. n. 12,305 (*PNRS*), of 2010 (BRASIL, 2010A), and its regulation through Decree n. 7,404, of 2010 (BRASIL, 2010B), create possibilities for inclusion and improvements in the pickers' lives. Previously, the Basic Sanitation Law (Law n.11.445), of 2007 (BRASIL, 2007), besides including the problem of solid wastes as a full part of basic sanitation, established the possibility of making a contract for the services of pickers' cooperatives, extending to this population the opportunity of doing something and being compensated for the work they perform, doing away with the previous situation of a field of economic action restricted to the large urban cleaning operators.

One of the requirements of the *PNRS* is that Integrated Management Plans for Solid Wastes be structured. This has required city administrations to diagnose the current situation for the construction of the aforementioned Plans. Some data regarding the current management involving the amount of collection work carried out by the cooperatives of these public systems and their importance for the disposal of wastes to be recycled has been evidenced, for instance, in the case of the city of São Paulo. Today 75 of the 96 city districts are served by selective collection by two concessionnaires and by the

twenty pickers' cooperatives that have agreements with the City administration. Twenty Sorting Centrals are operating to receive the recyclable materials, one of them exclusively to receive electrical and electronic wastes. Currently São Paulo has an average of 1,085 cooperative members who receive a mean monthly income of R$ 850.00, per member (SÃO PAULO, 2012, PP. 110-111). Besides the Centrals, there are 45 organizations registered with a provisional license, with 270 members, that process the surplus materials of the cooperatives. It should also be recalled that there is a large number of independent pickers who work in the Metropolitan Region of São Paulo, estimated as 20,000 people (FUNASA, 2010).

The cities that structured their Management Plans participatively, in agreement with the legal requirement (BRASIL, 2010a), generally have presented proposals for increasing collection by pickers, with the expansion of work and income generation and, at the same time, enabling reverse logistics, diminishing waste generation and diminishing the amount of materials sent to the sanitary landfills. Currently the rate of materials sent to recycling is still well below its potential, considering the possibility of work by the number of pickers and the potential to optimize the massive participation of the population, with appropriate separation at the source. Today, in São Paulo, for instance, formal selective colletion recovers less than 2% of the household wastes generated. In the coming four years it is hoped to increase this disposal to 10% of these wastes, according to the Plan of Goals of the present municipal government (SÃO PAULO, 2013). Both the Plan of Goals and the PGIRS are being restructured so as to incorporate the results of ongoing participatory processes.

Currently the pickers who have already been included in the public systems participate at different stages according to the municipality: some are organized as teams, performing door to door collection, as in Diadema and Londrina: the action of others is limited to sorting in centrals/sheds equipped by the city administrations, as in São Paulo where there is an articulation with cooperatives and smaller associations, in which the pickers collect door to door. In Ribeirão Pires, a small town (113,068 inhabitants), today there is only a single cooperative that collects door to door and does the sorting of wastes from household and from some large generators. However, this city has a very efficient door to door service and the pickers themselves mentioned that the percentage of rejects from the sorting table is low.

In their daily work, the pickers establish direct contact with the population. For those who have constant collection of materials in defined neighbourhoods and streets, as for instance, in Ribeirão Pires, there is often a

dialogue with the householders, and in many cases a relationship of trust is established. This is expressed in an invitation for a demitasse (cafezinho), and in daily conversation, often about problems concerning the neighorhood and the city. In this relationship, there is an exchange of information about the collection, such as aspects of sales, problems of storage and the contamination of these recyclable materials collected by the pickers. The householders gain a better understanding of the entire selective process, where, by whom and how theirs wastes are carried off after leaving their homes.

One of the practical results of this educational action of the pickers is the quality of the wastes collected door to door by them, since the materials arrived for sorting less contaminated by organics. Because the picker has established personal contact with the householders, there is greater social control over the waste problem. This and other specificities of selective collection have been solved in the neighborhoods where the cooperatives work, going from house to house, explaining the most appropriate forms of storage and delivery of the materials.

Compared to the materials collected in a massive amount by the trucks without contact between picker/householder, they present an inferior quality. In this case the materials also worsen working conditions of the pickers in the separation process, since they are contaminated by organic wastes and bring to the sorting table, bacteria and other organisms that generate various (biological) risks to the health of the pickers and the environmental health of the sorting shed and of the neighborhood itself. The situation is even more acute if the material is transported by compactor trucks used by many city administrations. The wastes arrive pressed, which often prevents their separation. In this case the pickers complain about the risk of cuts and other accidents caused by materials crushed by the compactor.

The scenario of selective collection with the inclusion of pickers has been well designed. The expansion of this work depends on a significant effort and strengthening of environmental education for greater participation by the population and formative processes with the pickers. Next we shall discuss the concept of environmental education. We introduce the idea of the pickers becoming environmental agents andf getting them involved not only, but also in actions of environmental education. These actions can contribute to the awareness-building of the population and finally to the advancement of the Zero Garbage proposal.

ENVIRONMENTAL EDUCATION AND THE ROLE OF PICKERS

Mentioning Environmental Education [EE] does not reveal precisely the characteristics of the act of education, since this is a polysemic expresssion that takes on rather different meanings. There are several principles that have been considered in the different spaces for dialogue and in the documents that guide the EE actions.

Since the 1970s Environmental Education has been considered a special space to try to overcome socioenvironmental problems. Currently the concept of EE has been even further strengthened as a a priority space to seek socioenvironmental sustainability, since the Technologies do not reach results with broader transformations sought in educational actions. It is present in the summary documents of the regional, national and international meetings. In Brazil there are already several legal instruments that validate guidelines and principles and demand the implementation of EE at all levels of education systems – constitution of 1988, National EE Policy (BRASIL, 1999). There are programs that more clearly define the characteristics and possibilities of EE, such as the *ProNEA* (National Program of Environmental Education). In the last two decades, documents were elaborated on the public policies and institutional government spaces were defined to ensure the implantation and implementation of these educational actions. Spaces of networks of civil society, local institutions and movements were strengthened ensuring the rise of decentralized processes with or without government support.

In a form consistent with these guidelines, ProNEA was constructed within the scope of the Ministry of the Environment, with the participation of civil society in 1999, It proposes a web-like structure to exchange experiences /knowledge. As the ProNEA indicates, according to the MMA, this decentralized form, known as architecture of capillarity, allows covering an entire territory with the *"clear objective of promoting self-managed, perennial and sustainable continuity"* (BRASIL, 2013). The capilarization processes are essential because they enable the involvement and greater commitment of the population to environmental problems, since they provide possible solutions, in a participatory manner and, at the same time, ideas and proposals involving environmental management, or coming from the population itself, or rooted in the different localities.

Another principle to be highlighted in several EE dialogues is transversality and social control. Like capillarity, participation and social control appear as

fundamental guidelines for educational actions within *ProNEA*. For these two principles the Program emphasizes the generation and availability of information.

ProNEA values participation in the discussion, formulation, implementation, inspection and evaluation of environmental policies aimed at constructing cultural values committed to environmental quality and social justice, and at supporting society in seeking a sustainable socioeconomic model. (BRASIL, 2013)

Participation in structuring and management is in itself considered an educational strategy. Among the natural tendencies of Environmental Education in Brazil (QUINTAS, 2004) this has been considered one of the forms with the greatest consequences from the standpoint of serving other principles of sustainability, besides social control, responsibility and the involvement of the local community in seeking solutions and acknowledging different social actors, enabling the expansion of understanding of the sociopolitical context, strengthening citizenship and autonomy, in the historical sense, as presented and discussed by Paulo Freire (1996).

The active participation of local society in the solutions strengthens co-responsibility, not only by acknowledging actions and their consequences (linear understanding of cause-effect), but by the change of values, such as ties with the dynamics of the local environment, immaterial cultural values, environmental perception and the onset or reappearance of the feeling of belonging.

As already mentioned, the pickers have had a significant role in the recycling chain, but, equally important, in several regions they have been responsible for explaining waste disposal to the population, and the importance of appropriate behavior to reduce the generation and the problem of disposing of solid wastes. Thus, what was previously considered garbage, which would disappear as soon as the collection truck turned the corner, appears in this context of collection as material valued for its importance for this part of the population. In the continued door to door contact, the process of disposal and management becomes entirely recognizable.

These workers became pickers because of an economic system where there was unemployment (high from the 60s to the 90s in Brazil), with extreme social, economic and cultural exclusion. As the selective collection systems implemented in several municipalities with their inclusion, evolve, this work begins to be recognized, initially in the environmental and economic dimension. However, as the importance of EE is debated, as an action of values for co-responsabilization, and to improve living conditions, it is essential to understand the role played by the pickers in their action towards the population with which they interact, as they say, they do slow, constant, small scale work which is

as important as the decentralized management of wastes and of capillarization in the relationship with the householders.

The pickers need training to work as educators. Not just any training marked by passing on information from those who know – teachers, training monitors, multipliers - to those who do not know – pickers, students and population in general. The principle considered here is that in EE all are teachers and learners. Specifically, with these social actors who perform the collection, there is a large accumulation of information – as compared to the physical geography of the place, the dynamics of the population and of the local institutions; the types of wastes generated at this locality, among so many other knowledges accumulated in practice. In this sense, experiences of participatory processes of education, with collective learning, have shown possible routes to recover self-esteem, to grow and understand more about the problems concerning the impact of solid wastes and of the broader issue of the socioenvironmental problems.

THE EDUCATIONAL EXPERIENCE OF DOOR TO DOOR SELECTIVE COLLECTION

Since 2005, Project Brazil Canadá Selective Collection [*PSWM - Coleta Seletiva Brasil Canada*], a collaboration between the University of São Paulo and the University of Victoria, in partnership with organized groups of pickers, local governments and some representatives of NGOs, has worked to strengthen and improve the activities of recycling cooperatives in the metropolitan region of Sao Paulo.The empirical results that will be presented next are the result of collaborative work performed by the Managing Council [*CG- Conselho Gestor*] of this Project in which representatives of the segments involved in the project participated, including the authors of this project. Collectively, new interdisciplinary and intersectorial knowledges were generated during the interaction at this CG, and also during the different activities performed by the project. The discussions and actions of the CG involved issues of policies and management of solid wastes, participatory management, social inclusion, gender aspects, and others. The research associated with the PSWM throughout its development was characterized by community, participatory and action research methodologies. Their focus and objectives were always defined with the knowledge and approval of the CG.

According to Michel Thiollent,

Action-research is a type of empirically based social research that is conceived and performed in close association with an action or a resolution of a collective problem and in which the researchers and participants who represent the situation or the problem are involved in a cooperative or participatory manner. (1986, P. 14)

According to Carlos Rodrigues Brandão, the participation of the people involved in this situation determines a commitment that subordinates the scientific research project to the political project of the popular groups whose class, culture or history is to be learned. The purpose of intervention is to provoke a liberating social change, through awareness-building based on the new collectively generated knowledge. As Thiolent (1986) reminds us in action-research it is necessary to produce knowledge, acquire experience, contribute to the discussion and advance the debate about the issues approached.

The proposal presented in this chapter, of expanding the role of picker to environmental agent/educator is based on the reflections of the CG and on the action research experiences with the pickers, during the last few years. Participation is the key word in the context of this intervention project. A specific study by Takahashi and Gutberlet (2007), whose main purpose was to evaluate the door to door system implemented through the Clean Life Program in the municipality of Diadema since 2004, provided a major contribution to this reflection. This study applied a structured questionnaire involving 133 residents of Diadema, who at the time participated or not in the Selective Collection Program. In this study semistructured interviews were also performed with the pickers of the Clean Life Program. Interventions and participatory observations during visits to recycling cooperatives, as, for instance, the participation in pickers'activities during the collection and separation of the materials, brought a wealth of knowledge from the pickers'daily work.

The pickers' goal of bringing environmental education to the population can take place at different times during the door to door collection itself, or at specific fomative/educational moments, as in the classroom in schools, in talks, seminars, or during exhibitions. Today some pickers are already taking the discussion of selective collection to these spaces, contributing to a greater awareness of garbage and wastes/resource. It is essential to sensitize the school community to the problems generated based on the production/consumption and generation of solid wastes.

The importance of some factors that contribute to maximizing the pickers' efforts as environmental educators is evidenced based on interviews

and participatory observation by the researchers. For instance we found that wearing a uniform means the formalization of their work and it is important to identify the pickers. Therefore, the uniforms must always be clean and tidy to convey a pleasant image of the selective collection program in which they are participating. The pickers themselves mentioned that they feel more valued when dressed appropriately, dissociating them from the dirty image connected to work with solid wastes.

The study identified a few necessary qualities that facilitate interaction with the householders, as, for instance, having good communications skills and taking the initiative to explain the selective collection program, and disseminate information about participation in selective collection, reuse and changes of habits, thus reducing consumption and wastage.

It is advisable to work in pairs so that the agents can benefit from mutual support. There should certainly be affinities and complementations between this pair or the group involved in order to achieve the best effort. The commitment to the householder is preserved via assiduousness and respecting the collection schedule. The survey also reiterated that it is always necessary to renew the householder's commitment to collection, because without this continuous attention of the pickers to the residents, many households stop collaborating or the quality of their participation may diminish. At the time of the survey, for instance, most of the householders interviewed did not know all the recyclable materials.

The study reiterated the importance of the presence of the picker in the neighborhoods, as proven by the following utterance:

> *"The picker [...] walking with his own legs, because then he becomes known, sets an example for others. In the truck it is like the garbage truck, the truck goes by so fast... Not the picker, you come to a house, clap hands, explain to the housewife what the program is,what collection is,. Not so the truck [...] they asked and we told them that besides helping to preserve the environment they were helping us who were unemployed, to generate income, I'm not the only one here,there are eleven of us pickers."*

The access of pickers who perform door to door collection to the householders provides great opportunities to make them aware of the reuse of the resources that are embedded in the garbage. In the dialogue with the residents, the pickers brings information that the population does not yet know, as a female picker says:

> *"Many women hold the milk box and ask: do you take this? And then we talk with them, explain [...] They don't know what they should collect.*

One of these days a woman was about to throw away her iron. I told her, no, we will take it."

A few gender differences were also recorded in the behavior of male and female pickers and their interaction with the public. It has been suggested that women are praised more than the men, because they appear to be more patient, as one of the female pickers says:

"Because they say that women are more patient, they wait longer, pay more attention. Sometimes we have already passed with the cart and they shout and we turn back and take it, while the men would already have passed. And people were complaining."

The educator/environmental agent picker's activity should be developed in partnership with the local government: with the departments and other public institution programs, using their personal and financial resources in an integrated manner. Inclusive selective collection requires shared management with a multidisciplinary and intersectorial government team to be able to treat complex solid wastes and to ensure continuity of services. A local government technician in Diadema confirms this view during the interview:

"When the team is a career position, it is no longer a personal appointment (cargo de confiança), which means that the practice has been assimilated, the public service was assimilated and that this has become an administrative routine. It is no longer an exceptional program, the political will only of the current mayor, it is more, it is a necessary service without which one cannot live, it has been implemented, it must be maintained... broadened, it has to be improved, this means that it must be accepted."

Other difficulties in implementing selective collection programs with pickers who are also environmental educator agents involve internal administrative problems that occur in many cooperatives. Restricted access to formal education, low remuneration of the selective collection service, marginalization of people who work with solid wastes, the fact that some pickers are alcoholics and/or drug addicts, and others, are factors that reiterate social exclusion and make it difficult to carry out the proposal of the educator picker. It is necessary to do things that will recover the citizenship of the pickers and empower them. These things can be: continued education, fair remuneration for the service rendered, the use of uniform and grease, the availability of appropriate technology or the support of specialists to solve social and economic issues that now affect pickers.

Furthermore, the municipal government often lacks the financial resources for the investments needed in infrastructure and central aspects, and to remunerate the pickers for services rendered (collector and environmental agent). Today, in municipalities that have a law for this, remuneration is set by the value paid to the contractor who performs conventional collection using a dump truck. The real extent of the service rendered by pickers with door to door selective collection has not yet been widely acknowledged, nor the social communication that accompanies this activity. We repeat that the activity of pickers/environmental agents during selective collection should be continuous, to be able to deal with the multiple aspects of zero garbage and of the continuous reinvention of this concept and the solutions. Clearly this discussion is only beginning, and few people acknowledge this facet of the pickers' work. A fair assessment of the value of the different services provided by pickers and the accounting of the environmental and social benefits resulting from these activities would be essential steps for the proposal of environmental education, aiming at conscious consumption, the reduction of wastage and the recovery of resources to become a widespread daily practice.

FINAL CONSIDERATIONS: THE TRANSFORMATION OF GARBAGE INTO A RESOURCE AND OF THE PICKER INTO AN ENVIRONMENTAL AGENT

The organized and continuously trained pickers who work in door to door selective collection may become agents or environmental educators and promote selective collection and the reduction of garbage generation. Over time these agents can contribute to the environmental awareness of the householders with whom they interact continuously. Their work as educators can also reach other forums such as schools and universities. By playing this role, the pickers become catalysts to promote zero garbage.

There are many social and environmental gains from the inclusion of pickers. They range from savings in raw materials and reduction of environmental contamination to the generation of work and income and improved environmental and community health, including the contribution to greater social cohesion in the community. In the interaction with the

householders, a change of habits occurs, with the renewed enhancement of the value of the materials, as well as the acknowledgement of aspects essential to understanding the problem of wastes.

The transformation of pickers into educators requires continuous training and capacity building work with a view to bring back the pickers' citizenship and empowerment, besides continuous technical capacitation. At the same time as this process, it is necessary to implement public policies that

(1) will strengthen and support the inclusion of pickers in the formal system of solid waste management;

(2) will transform the current development model that is still promoting programed obsolescence and unsustainable life and consumption styles into innovative zero garbage proposals.

As to the promotion of broader changes, such as the proposal for sustainable consumption and production, a fundamental aspect is the promotion of educational actions that, besides providing information, may reduce the immobility imposed by the magnitude of socioenvironmental problems.

Acknowledging pickers as social actors and the possibility of helping increase their income have motivated the delivery of materials. Communicating with these workers is a concrete form of understanding the collection system and of being able to participate in solving the socioenvironmental problems of the wastes.People are much more sensitive to the picker's utterances than to that of an educator or some other social agent, because there is clearly a real possibility of helping to improve the world. From a generic, and in a way abstract problem, because there is no recognizable subject, it becomes a direct relationship with a worker. There is a real possibility of collaborating and being able to participate in waste management and in greater and more essential changes.

In a dialogue with with Marcos Sorrentino, published on the eve of the 1992 Earth Summit in Rio de Janeiro (*ECO 92*), when he was talking about the need to break with nihilism and immobilism, and with the reasons that lead to these states, many advances are perceived. The approval of public policies themselves, involving the environment, social inclusion and environmental education issues, show an advance in public management towards participation and civil society, in the sense of mobilizing for the clash of interests, with moments of real participation to approve these laws. Despite these advances, there is still a great need for these breaks, when greater participation is expected to create effective solutions and paradigmatic transformations of the conditions to produce human subsistence and hegemony in our world.

The approach to the pickers, to their living and working conditions, with their organization to take on their action in a more structured and potentiated way – even if public policies with their inclusion have been undder formation in the last decade – ; the acknowledgment itself of the current context of these waste management systems, through this contact with the pickers, reveals the concrete route for the problems resulting from our remnants, and, at the same time, may contribute to drive the will to participate and show alternatives to change our current life.

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A BRIEF HISTORY OF TWO RECYCLABLE MATERIALS PICKERS

MARIA DULCINÉIA SILVA SANTOS

My name is Maria Dulcinéia Silva Santos, I have been a member of the Cooperative of Autonomous Pickers of Paper, Cardboard, Paper Scraps and Reusable Materials [COOPAMARE - Cooperativa de Catadores Autônomos de Papel, Papelão, Aparas e Materiais Reaproveitáveis] for 12 years. I came from the state of Maranhão to work here in Sao Paulo, and I have been here for 12 years already. During this time we have had lots of struggles. I participated in creating the National Movement of Pickers, the Cataforte [1] and the Sampa [2].

We had many struggles during these 12 years, although the other pickers have been fighting for this for many more years than I have. In my town there was no recycling, in fact it has only just begun. I lived in Imperatriz do Maranhão, and there I never even heard say that plastic could be recycled. I learned about recycling here and struggled together with the movement, I helped found the Movement and Cata Sampa. Actually, I have just come from a meeting in Guarulhos, we are reinforcing the network to join all cooperatives together.

I joined COOPAMARE the first year I came here. I came to work as a companion to a lady who lived in the Jardins neighborhood and, on my free days and in the evenings I would go out on the streets of Sao Paulo with a woman who was an acquaintance of mine, who already lived here and had brought me to Sao Paulo. We went around collecting cans on the streets

of Sâo Paulo at night and then went to sell them to COOPAMARE. In those days they bought them and paid immediately. I worked with these people for one year and then I left to work definitively with the cooperative. There we went through many struggles, struggles not only to manage to improve our class, but with the Government of Sao Paulo itself, because they wanted to take us out from under the road bridge no matter at what cost.

The people participated in the Embrace of COOPAMARE, thank God USP was with us, all the pickers, the surrounding community near us too, all participated and it was thanks to this Embrace that we managed to get a cession from the Kassab Administration, and the cooperative has been around for 22 years already, now we managed, this process of taking possession of the place, it took almost three years, and so you can see that it was a big struggle.

And we are together here, with the National Law of Solid Wastes, which was approved, and we are also together in incineration, which will be another nasty fight that we are going to have, and we are together here, together with the movement, with all of you to support us, to give us strength so that we can win this battle too.

Pickers are not ordinary pickers, of whom we knew a lot in those days, garbage pickers. When people interview me and say: "ah, you are a garbage
430 *picker" I say "no, hold it! I am a picker of recyclable material. Garbage is picked by LOGA [3], to take it to the landfills". So we are in a very determined struggle.*

Eduardo can tell you about the history of COOPAMARE, since he was one of the founders, he has been there since the beginning. He will also say something about the laws, because he is more inside the Movement itself, but he is still COOPAMARE, except he stepped back a bit to work with the Movement itself, which was a lot of work, it was not possible to do both. So we gave him this opening for him to be with us, but he is here in the struggle with COOPAMARE and all the pickers in Sao Paulo.

WALISON BORGES DA SILVA

My name is Walison, I have been at the cooperative, at COOPAMARE for nine years, and in the beginning, when I joined, I did not really know what recycling was. I knew that there was that heap of material and that I had to work hard" to earn my living from it, because there was no boss, I was my boss. And today I have donated myself to the movement, with my fellow cooperative members,

showing the importance of recycling and of our health. And today, the Sao Paulo that I see no longer has any space to throw away so much stuff. I go crazy when I see this word. I think that one has to invest, the government, the City Administratin, in this field, to help the pickers, which is very important, because the pickers know what recycling is.

[**1**] ***PROJETO CATAFORTE*** Strengthening Associativism and Cooperativism of the Pickers of Recyclable Materials is done through a partnership between the National Office of Solidarity Economy [*SENAES - Secretaria Nacional de Economia Solidária*] of the Ministry of Labor and Jobs [*MTE- Ministério do Trabalho e Emprego*], with the Foundation of the Bank of Brazil, beginning in 2010.
[**2**] ***REDE CATA SAMPA*** (Cata Sampa Network) is formed by 15 cooperatives and associations of recyclable materials pickers, from Sao Paulo, in the region of the Alto Tietê Cabeceiras and the Sao Paulo Coast, whose goal it is to expand and organize a solidarity economic process in these organizations.
[**3**] ***LOGA*** Environmental Logistics of Sao Paulo [*Logística Ambiental de São Paulo S.A.*] is a company employed by the City Administration of Sao Paulo, to provide specialized services for the collection, transportation, treatment and final disposal of the household wastes and the health services generated in the Northeast Grouping in the Municipality of Sao Paulo.

THE HISTORY OF COOPAMARE: DIFFICULTIES, STRUGGLES AND ACHIEVEMENTS OF THE PICKERS

EDUARDO DE PAULA

First I will tell a bit of the history of the Cooperative of Autonomous Pickers of Paper, Cardboard, Paper Scraps and Reusable Materials [COOPAMARE], then I will slowly come to the importance of pickers concerning the issue of solid wastes. COOPAMARE began with a group of street pickers, in 1986. It was a group, together with the Organization of Fraternal Help, which is a non-governmental organization working with street people.

In those days there was always the community of street people, where all pickers gathered to discuss an idea or two, to have soup, there were also clothes there. Our pickers, street people, kept going there, and every year there was a party called "The Street People Mission". And it was the pickers who organized the party, the people who lived there always took things from the market to make this soup. And with all this, they wanted to have a nicer party, they wanted to participate, not only picking things at the market, but participating in another way, contributing money. So, there are many people on the street who work, at the time there was one who sold coffee, the one who parked cars, the shoeshine boy, the street vendor and the recyclable material pickers, paper picker they called it in those days. So the group would

split up, each of them would go and do what they usually did to gather money for the party. The street vendor would use some of his vacation money and contribute to making the party. The coffee salesman also took some, in other words, everyone contributed.

The paper pickers did things a bit differently. There were many street people who were pickers and they formed a group and got themselves a small room From this room, they started bringing paper to this little room on their heads, and filled the room until it was full, to sell this material. They sold all the material, counted out the vacation time of everyone, of each group. Among all those who contributed, the outstanding ones were the paper picker group. Why? It was possible to make the party and there was money left over. And the groups of pickers was outstanding under those circumstances, because they acted as a group. So what one immediately thought of was: if the idea worked there, it worked at that moment, when a group got together, collected the papers and sold them collectively, why not go on doing so? That was when the paper pickers began to be motivated, to gather in groups, and on gathering, they got together and began to discuss things. The pickers would come and began to meet and first formed the association, in 1986. In 1986 the first association of paper pickers in Brazil and of Sao Paulo was formed, that is when it all began.

From then on, this association was set up in a matter of politics at the time, because the pickers were already suffering repression during the administration of then Mayor Janio Quadros. Janio Quadros said that the garbage belonged to "them", so to have political force we had to form an association. We went beyond, when the association had already been formed, the idea was to get out of the scrapyards, why not set up the cooperative? That is when COOPAMARE was founded, in 1989, with all the goals and principles and in a spirit of ethics.

At the time, the first goals of COOPAMARE were to eliminate the scrapyards, to think about a production chain, as everyone thinks even today, and also to think about organization, about valuing the pickers, because at the time picking was the last resort in life. If you were picking paper, it was because you were living in the gutter, in a difficult situation, it was not even unemployment, after unemployment it was a very, very difficult situation, one had gone through several obstacles in life, socially, and all that, that is when one had to live next to the gutter. And we overcame this. What was the purpose of COOPAMARE? It was to give the pickers, who more mostly street people, self-esteem, to give them self-esteem because working at picking paper is an activity like any other, it is a profession, like being a doctor, a teacher,

a driver, well, several professions, because what they are doing as pickers is work. Besides working, they are helping to preserve the environment, preserving the assets, the assets for the public authorities, for society and for the environment. And it was in this way, with all the goals, tht COOPAMARE grew and according to its principles.

And we really did not realize that we were doing a very useful job for society, for the public authorities, and the environment, because at the time we only wanted to pick, it was a matter of survival, it was difficult. Through this difficult situation we learned many things. All this that I am saying here, I took 20 years to learn, more than 20 years, and today I'm telling this here. Today I am part of the National Movement, I represent the Latino Network of Pickers, we leave the country to talk on our class's behalf.

So then we began with COOPAMARE, we raised this banner and it spread throughout Brazil. Other cooperatives came along, when the National Movement of Pickers was founded, which was also an arm of COOPAMARE, where we learned. And we began to realize that the problem was that we were thinking too small, so we said: "oh, today we are already big, we are thinking big, and we are going to think".

It was something we would say, "poor soul": "poor soul, a garbage picker". Today we no longer see ourselves as poor souls. Recyclable material pickers today are no longer poor souls, they are professionals. We are acknowledged as a category in the Brazilian Classification of Occupations [CBO Classificação Brasileira de Ocupações], since every profession, before becoming a profession is a category, and we are acknowledged as a category. And through this category, this action, this acknowledgement, we were acknowledged for the first time, under Mayor Luiza Erundina, who acknowledged our work as an activity in the city of Sao Paulo, so we made good use of it, and went far beyond it.

When one talked about the environment, one only talked about sun, soil, rain and stones. No one talked about pickers, about our category, we pickers, who had already been providing this service for a long time, and were still being discriminated against, as "maloqueiros" (slum dwellers), mendigos (beggars) and as "catador de lixo" (garbage picker). And today we have even managed to change this word, today we are pickers of recyclable materials. Today the garbage collector who used to say garbage collector, no longer is a garbage collector. Today he is the picker, the street cleaner (gari). Well, we have made it. What do I mean by this? That our category, today, is part of the importance of the issue of solid wastes, the picker is very important. They are important even in the economic chain. And today we see our work not as a "small business", but as a business.

This is because the National Policy of Solid Wastes [PNRS] says everything, we have 12 items in Law n.12,305/2010, which, when complete, tell us what we have to do. Today we also have Law n. 11,445/2007, which enables the pickers cooperative to render services without having to enter bidding. We have Decree n. 5,940/2006, which establishes that today, we pickers can collect recyclable materials from federal public agencies.

If all the federal public agencies had this consciousness of taking these materials to the cooperatives, at the frequency they should arrive there, but do not yet, we are still arguing, because sometimes there is a lot of resistance. Today we have lines of credit, funding from the National Bank of Economic and Social Development [BNDES - Banco Nacional do Desenvolvimento Econômico e Social], Petrobras, Fundação Banco do Brasil and Caixa Econômica. We achieved all this, we, the Pickers Movement.

Every year we used to meet with President Luiz Inácio Lula da Silva, who was a true friend of the pickers, who acknowledged the pickers' work and saw that debt 50 years ago, that he was not doing a favor, but simply turning the political page of this history, because people had never given such importance to the pickers' class and the view changed.

Now we talk at universities, we talk anywhere in the world, so our category has become much more valued. That category that was not acknowledged, that was seen as "beggars", "garbage pickers", "maloqueiro", we managed to prove, by our work, very honestly, in the sun and in the rain, both the one who is at the garbage dump, and the one who is pulling a small cart, the one who is organized or not organized, we have managed to prove that we are capable. Today many City Administrations recognize the business of picking through a payroll, as in Diadema, Araraquara, São José do Rio Preto and other cities, except the city of Sao Paulo. We wrote a law bill for the pickers to be paid for the results, but unfortunately our Mayor vetoed this law. But we will never give up, we are fighting,and getting increasingly organized to achieve our goals, and we are always collaborating with society, with the government authorities and with the environment.

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THE WORK OF CATADORES AT THE COOPERATIVES: AN INTERVIEW WITH BRUNA BARROS

PAULA NAVARRO CANELHAS
LARISSA BARBOSA DA SILVA

Interview with Bruna Cristina Cavalcante de Barros – President of the Association of Catadores of Recyclable Materials in Arujá (*Associação dos Catadores de Materiais Recicláveis de Arujá [CORA]*) cooperative, on April 12, 2013, by Paula Navarro Canelhas and Larissa Barbosa da Silva, students of the Environment Management Course at the University of São Paulo [*EACH/USP*], while drafting their final paper entitled Reciclagem de EPS (Isopor®): Um estudo de caso na Cooperativa de Catadores de Recicláveis de Arujá [*CORA*], (Recycling ESP (Styropor®); A case study at the Cooperative of Catadores of Recyclable Materials [*CORA*], Advisor: Prof. Dr. Sylmara Lopes Francelino Gonçalves Dias.

LARISSA AND PAULA: Bruna, could you tell us a bit about yourself and how you got to know about CORA?

BRUNA: *My name is Bruna. I am 24 years old. I live in Arujá. Right now I am living with my parents. I have worked at the Cooperative for four years. I discovered CORA through my family. It was my mother who first heard of it. My brother and my aunt were unemployed at the time. It happens that they saw it in the newspaper, that small blue newspaper, and it was also published in Tranqueira. So, they were unemployed, with problems like all families have, let us find out more, so that was a way... they entered and there was an opportunity, not here at this one,*

there, when it was at Fazenda Rincão. The first to join were my mother, and my brother Adriano. Then my aunt Priscila who later died worked here for a long time. Then they came, and began to work. At the time I was working and also studying, so things were rather tight at home, I had to help my siblings, I had to help my mother pay rent, I had to help my mother get food for the family. So those two came along and began to tell about CORA, and so on. So CORA also needed more members for the cooperative to help the work, and I joined. Then, when I entered the cooperative I was placed at the sorting table, selecting materials. I stayed there, and I developed my work further, I wanted to know how the cooperative really worked, I am here until now. I entered in the sorting section, I was also a catadora, I have worked in the yard, I have already... done a little bit of everything, here.

LARISSA AND PAULA: And what do you do at CORA nowadays?

BRUNA: *I am the president of CORA, since 2012, when we really became a cooperative. We are an independent cooperative and I am president, we have a treasury, we have a secretary, independent of anything, any other attitude I take, I take it jointly with everyone else. There is no such business as saying that the City Administration will do the project and wants you to make a decision, fast! No, any decision to be taken, will be taken by the group, I let them talk, but I say there are consequences and there is a result. I just show them, give them guidance, but who decides nowadays are all cooperative members, in a general assembly.*

PAULA: How much does CORA earn per month?

BRUNA: *Income has improved a lot, it is one minimum wage... Sometimes it is one minimum wages, at other times, it is not, it depends a lot on the material. We depend a lot on the material, and also on the market, see? Some months the market is high, some months the market is low, so it varies a lot..*

PAULA: A minimum wage for the entire CORA?

BRUNA: *Here there no longer that business that people come here and....no! It is a cooperative and everyone earns the same thing, this does not exist. Formerly we worked like that, everyone came, when it was small, but today there is that thing, each person works at their own function, there are the styropor people, those who work the press, sorting, collection, yard, glass, oil, styropor, so each earns according to their work effort, their will to work and show their work, we praise them, today you will earn this much, you will earn a bit more, everyone here has something different from the others. Nowadays, at CORA 2013, that his how the new cooperative management is, different pay, because it is not fair for the people working at the table, from 7 am to 5 pm, to earn one wage, and another, in collection, who is doing nothing,*

or sometimes just playing around, it is not fair that they earn the same thing, is it? So we always have one who causes a problem, who does nothing, and it is not fair that they earn the same thing, right? So we always look at this aspect, missing work, on a doctor's certificate, whether they need something or not. We always have to ask them for an accounting, and there is the social aspect with which CORA works too. [...] We sit down with the cooperative member, we want to know what is happening to them, not only to them, but to their family. Whether they need something, some medicine. Because that is how it is, we are all members of the cooperative, we depend on the stuff that we collect in the city. So it is not just a matter of the member coming here and my saying: "You are going to do this today, and you are going to earn so much". No, he works here every day. We are practically a family here. So if he is not well, I will know it by the way he is acting. If he is all right, ok, if not, Ok. If at his home they need milk, sugar. Because often our income goes down, here, our income drops, so there are 18 members of the cooperative today. Sometimes when we have lunch here, for instance, I have lunch, I bring my lunch pail every day, some of the members come without lunch, this is not fair, today we sit down and talk. It is not right that some member arrives here and eats... we are eating egg, rice, beans, steak, a rib, and the other has nothing in his lunch pail, this does not happen here at CORA. Independently of anything else, what comes first is the catador's food, their health, then the work done at the cooperative, because we concern ourselves a lot here, because it is too easy, sometimes people out there come and say, "no, you work in a cooperative, how much do you earn, and so on...", but they don't see the social aspect of people, because here it is very difficult to deal with human beings, as I do today, with 18 persons in here, each one with their own problems, I have to study what it is, where I can put them, where they are, will they be all right at the press, is he really all right at the styropor? So I look at their health, I will put... I don't know, I have to go slowly, you see? I can't. So we have this social aspect, yes, independently of the recycling work, what comes first is health and food.

LARISSA AND PAULA: Tell us how CORA evolved since you have been here.

BRUNA: *A lot has changed. My, if I tell you what all has changed... Several things have changed, the atmosphere has changed, the group has changed, the group has changed, it changed, several people came in, liked it, didn't like it, because those who are at CORA, those who like it really have to like what they do, today at the cooperative, I think above all. Sometimes people join because it is an opportunity, sometimes another joins because of real need, they want to join, they like it, just as I did, I had several other opportunities in my life, to go into a firm, to join other places, but I like what I do here, helping people, knowing*

how to help them, how can I help them from outside, how can I talk about the group outside, see?. So I like it here today. The income has improved, the atmosphere has improved, the people have improved, the salary has improved, living conditions have improved.

LARISSA: The structure has improved, hasn't it?

BRUNA: *Yes, we are struggling to improve the structure, see? Because right now it is only promises, only promises, no... you are going to change, you are going to change, you are going to change. The physical structure here, see, current. So you say this, today we got a shed, which is project of the Federal Government PAC (PAC-Growth acceleration project). It was a struggle waged by the National Movement of Catadores, they worked hard for all cooperatives that do not have appropriate working conditions, for them to improve their working conditions. For a cooperative this means to get a shed. CORA was chosen for this shed, so this shed was inaugurated. Sort of inaugurated for inaugurating's sake, beginning of election time, understand?? Just saying that the mayor was great, so that's how it went....Then it had been inaugurated, and... no, you are going to move on such and such a day, and they all keep putting it off, you are going to move that day, there is only this missing, so, we are just hanging in there. There'll come time when we will stop, and no, we are not doing anything. Like today, I have to listen to each of them, because I am going down to the city hall, I'll argue, I'll debate, advisory council..*

PAULA: So it all depends on the city administration, does it?

BRUNA: *Precisely, then people... no, you are going to move, you have to move, you have to wait for the conveyor belt, you have move when the conveyor belt arrives, you have to move with the new machinery, all new, nothing old, sort of like that. But, in my opinion, I think the following, when poor people move, they move, everything closed, with door, whether there is a floor or not, when they go in, they work, they change things bit by bit, there at the new shed, there is arelady a shed, there is a conveyor belt, there is table, sorry, that we received as a donation from "donate your garbage", there is this table here that we got from Meiwa, there is a press, there are two scales, there is a glass crusher, there is a paper shredder, there is so to say everything.. So one can work, it is only they that are holding things back, understand?? Well, I really don't know what is happening, but CORA is acting, see? Independently of the advisory council of the city administration, we have several other opportunities of studying how to deal with this situation. If we really are going to move on our own, if we are really doing to wait for their positions, because if we don't insist, nothing happens. So at the last meeting with the city administration, which we had with CONDEMA, that environmental management group that took place at*

the city hall, I had a big argument about this, the CORA structure today,because did you see how the floor is here? Full of stuff, right? So if it rains there, I'll lose money on cardboard, white paper, I'll lose money in all, besides the boys working out in the rain, in the sun without any EPI, nothing. Because, now, unfortunately CORA... I can't take out 400 reais for EPIs. We get this from other people as a donation, from some firms where we collect. We make a great effort to work with gloves and things, all that, but we are in a big struggle, especially to change to have a better structure,because like this, we, I as new president of CORA, don't want to be tied to the city administration. CORA, we have our own legs, we have, we can walk, see? Because, outside, what do they see? That CORA depends on the city administration, that CORA has I don't know what, that we have our responsibility, we know this, we have several other problems ahead, and it is easy for people outside to talk, to say that CORA is not doing selective collection properly, CORA is doing this, CORA is making a mess, the styropor machine has moved to the new shed, and there it is a great mess, so it is easy to say things, understand? I would like to see in practice, we are here every day, the guys are there working, day and sun, in the rain, whether we are sick or not, they are working. So, man, we are getting water out of stone here. Then there are people who simply come, make up things, say that we do no have the capacity to work, there are people who say this, who think this of CORA. That really hurts...

PAULA AND LARISSA: And what are your expectations, the expectations of the cooperative members, for CORA?

BRUNA: *We are here, doing marvellous work in the city, talking, explaining about collective selection. So what do we want today? We want to move to the new shed, and we want to walk under our own steam, without depending on city administrations. Sort of like the contractors, CS Brasil. This is the contractor that the city pays to collect common wastes, right, organic. So we want to be like them, to work, to render accounts, we will render acounts. Nowadays, who wants to come here and render accounts for something, I have, man, this does not exist, what comes in or out, I have here inside, I don't have to hide it from anyone. So we want to get along like this, understand? Properly, but today I don't know what this implies, that we don't move, that we are not going to the new shed, that there is quarrelling in selective collection, that the white truck cannot collect at the school, that the cage truck, that today I have a serious problem in selective collection. The cage truck used to be handled by CORA, now with this new contract it is CS Brasil who does it, with their own collectors. But what happens is that today I cannot call CS Brasil and say: "folks, could you run down to the school and perform the selective collection, and so on". So I call the inspectors, the inspectors says: "Oh, Bruna, if you load*

the material you can, because the boys do not get off at the school".
So the telephone at CORA keeps ringing, and whom will the school call, the city administration? No, they may even call them, complain, to give us support, but they won't call. What is happening? Today, if people don't put the wastes outside, not even the schools, one passes on the street and you, you don't even notice. So, these are several of our problems today. So we have to get along under our own steam, that is what we want today.

LARISSA AND PAULA: And how is CORA doing today?

BRUNA: *Today CORA is getting along. Getting along well. With or without difficulties, we are here everyday, rain or shine. Facing some criticism, because there is only criticism here inside. There is very little, I count very few, I'll say two fingers, that are prepared to... that come here and say: "No, Bruna, Congratulations. Your work is getting along". Very few people. I can count them on my fingers. Man, we are doing.. whatever they ask us to do... that you put the garbage out in front, Tuesday, Thursday and Saturday. You organize the yard for me, you collect like this and like that ? We are doing our share, but their shares... nothing is happening. We are a cooperative, except we are in a suit against an association. I don't have an account yet, I'm seeing to it. A cooperative account. To be able to get out of the association. But this unfortunately is not yet feasible.*

So it stays on the account of the association, working in the association.
So we have to contemporize,... have to understand people's difficulties.
Today I didn't open the account because of the treasurer. He is a cooperative member of CORA and his name comes up with a problem. What should I do to him? Hold a gun against his head? "No you will have to clear your name because I have to open CORA's account" I have to know,man, his living conditions, how he...Understand? That is how it is. Then comes: Your tax registration card records show that there is something wrong. Can you see to that for me?" Understand? Man, that is not how it is. For me, take 10 cents from here, today, I'm taking it from everyone here. To give you an idea there are reports here that are all late. People, I don't have a printer here, I don't have a printer to print out a documents. For me, take 200 reais from a bucket to buy a printer, I'll be taking it from insider here. Understood? Before I do that, my heart already hurts in advance. Oh my mother has to pay that, one has to pay the accountant. Am I going to buy a printer? It is necessary to buy one. I'll pay the accountant and then I have to take it from another member of the cooperative to pay the accountant ? Man, it is all this. It is hard. What I have to tell is the following, now we are working, we have a strong group.

PAULA: And does all the recyclable waste from Arujá come here?

BRUNA: *Yes, that is, not even half of it, see? Because we do not manage*

due to this problem of having only a single truck, see? Not even half. So that is a drawback. see? Arajumérica, for instance, is one of the neighborhoods, formerly there was no problem. People went there, passed, the housewives would say "there is stuff here", the boys would go there, very quicky, pick it up, thanked. Now the catador cannot go and collect, to that extent I understand it, because there is a contractor [CS Brasil] paid by the city administration, and it has to be their responsibility, see? Because if something happens, if there were two collectors, it would be bad for them, I even understand, ... but I don't know, it is not the same thing as garbashe collection, understand? It is different, they say; "what is the difference?",But there is indeed a difference. With common garbage, you throw your waste into a black sack and put it there, the garbage collectors come by and pick it up, it does not stay there. Now, recycling is everything that you have inside your house that you no longer wnt, and you will put it at your gate, do you know what time the truck comes by? Then, there is that problem, there are independent catadores who will come by, and they only take what interests them, and sell it to the scrap dealer. And there is another problem, if a dog sees it, it tears the sack, there are several problems, and people don't appear to notice, they just leave it there....

LARISSA AND PAULA: *And what other problems do you have?*

BRUNA: *The gate. No one takes a position about anything. They say that they are doing something about it. So it remains open. And people come throwing. First, because Arujá does not have a landfill. The landfill situation there is chaotic. People who live there want to get rid of the waste.They do not get a gate for the cooperative. The way it is, what are they going to do with an open gate? Are they going to wait for CORA to open on Monday, to ask whether they can throw the stuff away? They'll come in. They don't care. That is why it is here. And for me, calling the city administration to send the garbage truck. Man, it is tough. Really tough. Man, does the garbage truck comes here... A garbage truck and a tractor come. Man, they can't take it out in half an hour. They don't. Because when they came to put gravel here I asked the tractor to clear some waste lying there. Man, they can do it within half an hour. In half an hour and everything will be clean. So, you know what happened? I called the Department of the Environment, I said "could you please send a tractor, would it be possible to send a truck." I can even understand about the truck.. trucks often break down, more at the landfill, than anything else. So they send a heap of black garbage sacks for "me " to tell the members of the cooperative to put the garbage in the sacks, "tie it up and put it out front". Really? That delays all of my work!. The members of my cooperative in rain, in the sun, making a big effort to not leave all of the stuff on the ground, doing that work putting the garbage that the people* who live there themselves *put*

inside the cooperative, into a black sack. It really sounds like petty objections, doesn't it,? Really. So, we are really put into strange situations. [...] A truck here, get a tractor, and this... take away, clean, and it cannot remain the way it is. Because nowadays it does not stay here. The truck, the material arrives, the guys go out and press all of it. The women sort, separate. It goes directly to the press. And it leaves there already sold. The only problem is that stuff that people come and throw here. That is why the ex-president of CORA is being sued, someone denounnced. this, see... they denounced him about this trash there. That is why it happens... because of this mess of garbage there. The neighbors are not against our work...understand... but ... because of this mess of garbage, here. We wait:"No. We are going to help you...". [...] Then what happens is that people say: "No, we will ask the Department of the Environment". Then one talks to the Department of Works, because they can give permission for the truck. Then what happens is: One Department, one thing goes to the other. You know. Nothing happens. Nothing happens. Who is always the loser? CORA. So they come here: "My! What a mess! Look at all that garbage! You do not have the capacity to do something about it.." That is what happens. They don't know how it is. They do not come to CORA. They don't come. They don't stay here for a day. They don't. They don't stay here a day to know. [...] It is complicated. Very difficult [...] Man, some things.... You have to look and say: God give me patience, wisdom, for me to deal with these people." Because otherwise I'll have a baby right here, see ? (laughs). It is true, one must be really firm. Nowadays, all the same I tell them [the cooperative members]: "People, we depend a lot on the city administration today, but we must also know the consequences that lie ahead, we also have to learn to do things on our own. So they know this. And that is what we want. Plan for 2014. End of 2013. That is what we want. To work like any other business. Rendering accounts to the city administration, all good and proper, what comes in and what goes out. And working like any other business. Don't come and say: "You are working. My! Congratulations, eh. Now with this new collection you are working at a great clip. Oh, wonderful! No. It is only one blow after another. Even so, I thank God for every day, I am here with them, and if God sent me here, I have to do something, don't I, girl?

PROPOSITIONAL OBJECTS: DESIGNING WITH WASTE

STUART WALKER

The following propositional objects* were created over several years within an academic setting as part of a practice-based research agenda that explores design for sustainability.

All these objects incorporate waste materials and re-used components. The aim of this research, which embraces the active, creative process of designing, is to raise awareness of the thoughtless disposability of consumer culture. This thoughtlessness has become normative in the economically developing countries and is rapidly infecting many countries that had managed to retain more traditional values and ways of living until very recent times. Hence, these propositional objects aim to demonstrate the richness of a material culture that is moderate, responsible, one-off and particular – in contrast to one that is mass produced, ubiquitous, anonymous and inherently destructive.

Through recovery and use of waste, through the creation of good local work, and through the development of new forms of and new aesthetics for material culture, it become possible to restore a sense of meaning, purpose, care and dignity to people, skills, resources and the materials taken from natural environment.

* For a comprehensive explanation of the background and development of these objects, refer to: S. Walker, *The Spirit of Design: Objects, Environment and Meaning*, London, Routledge, 2011.

450

‘Kind of Blue’ Chair
reused wood, screws, nails, glue, acrylic paint

Low Chair
reused wood, screws, nails, glue

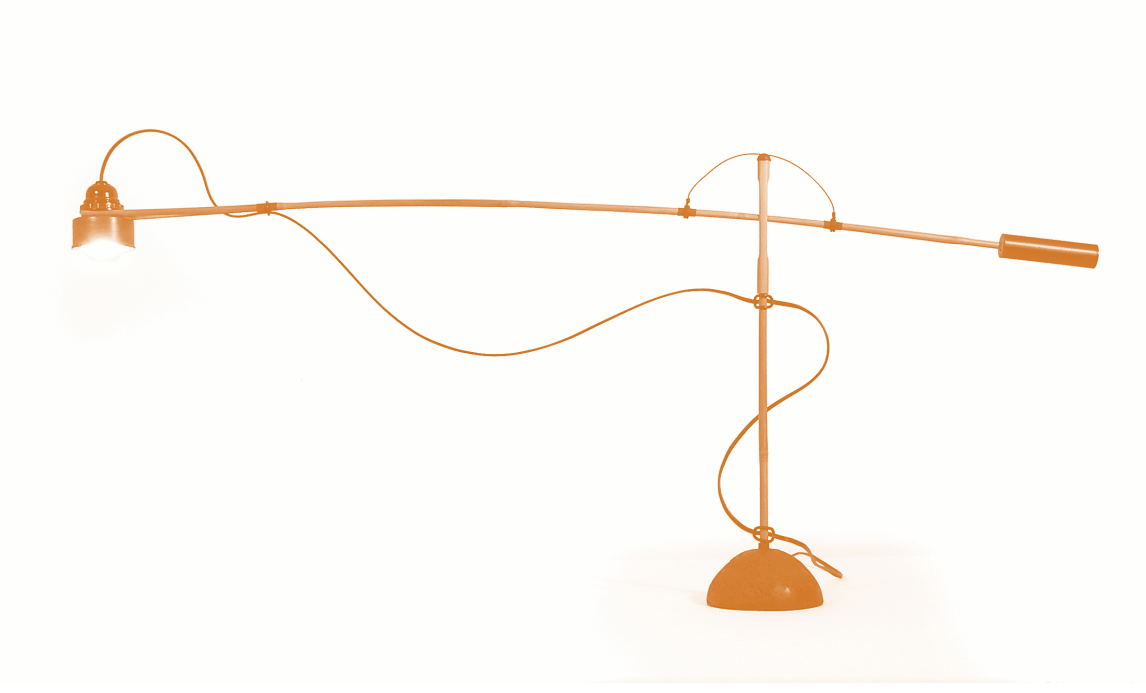
452

Bucket Seat
inverted galvanized bucket, silk, pine

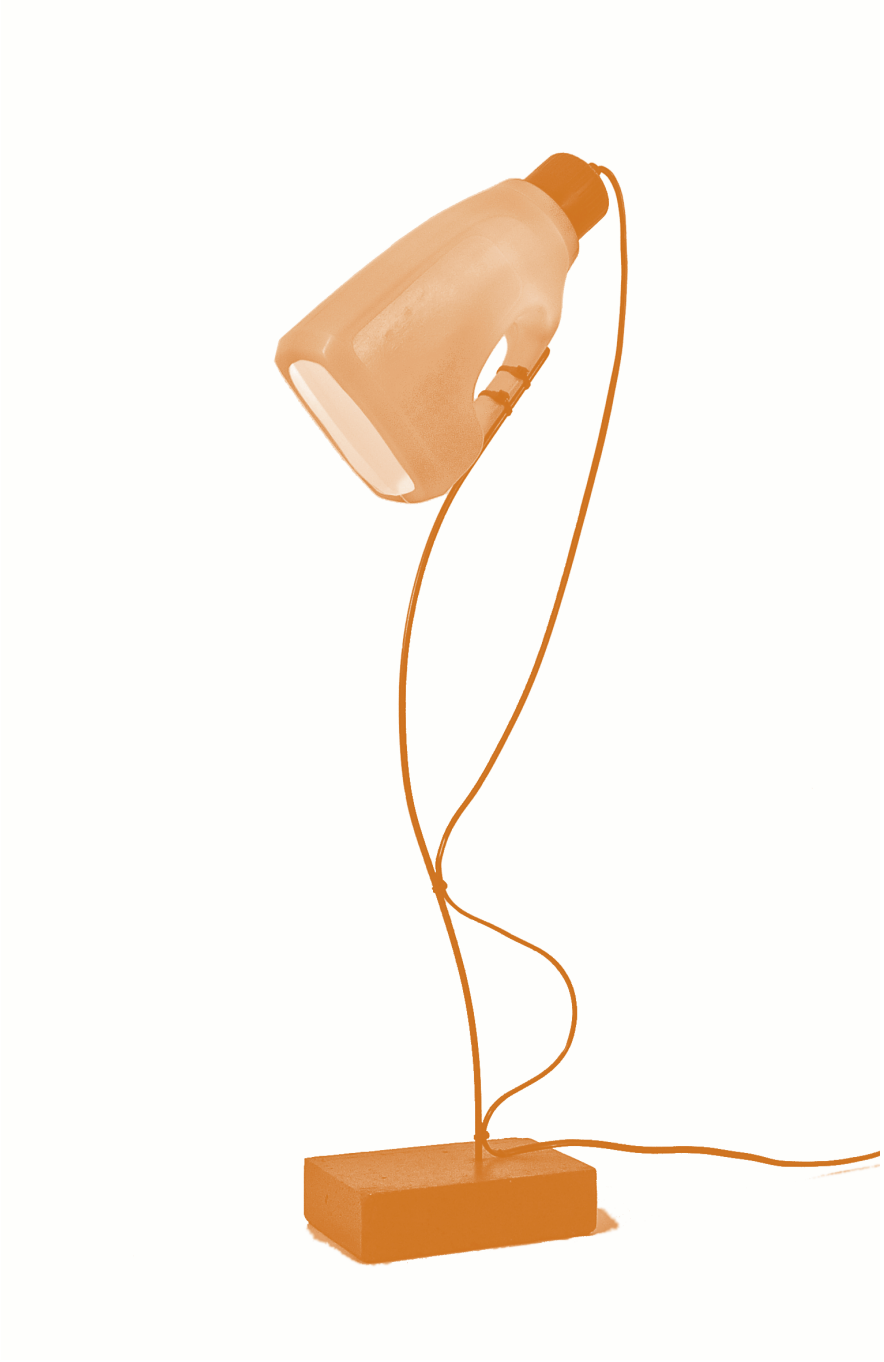
453

Ramora Box: a leaning wall cabinet
old pine planks, threaded rod

454



Arc Lite: a task lamp
bamboo canes, tin can, steel pipe, concrete, off-the-shelf electrical parts



Lather Lamp
plastic soap bottle, wire, concrete, off-the-shelf electrical parts

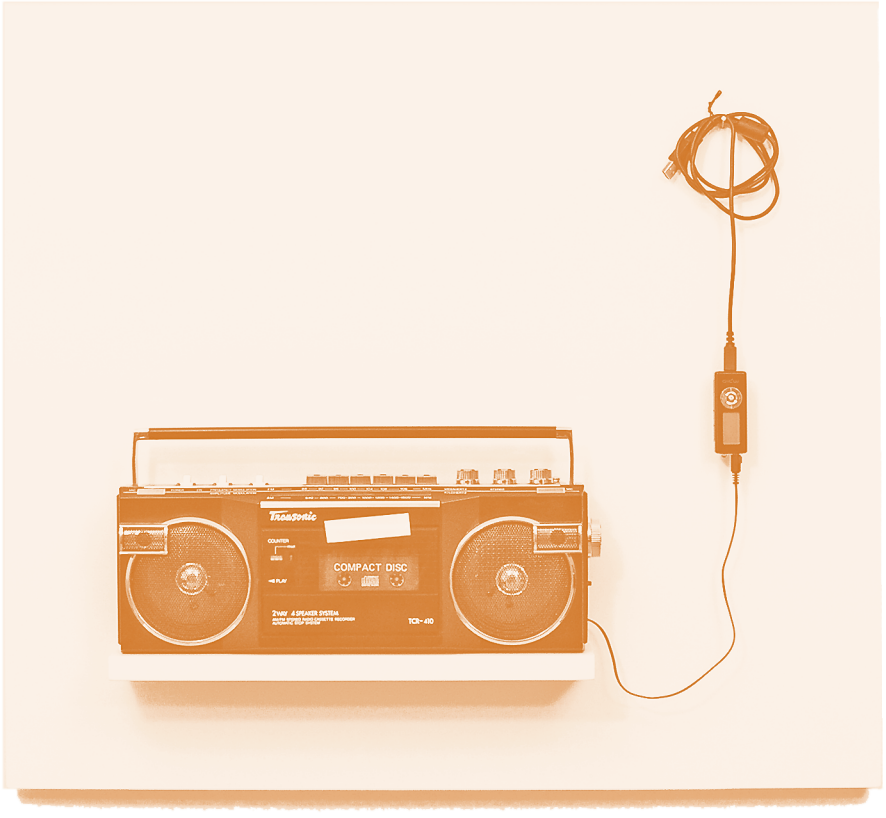
456

Ad hoc Torch
found parts, copper wire, plywood

WineLight 1
re-used bottles, re-used MDF, off-the-shelf electrical parts

458

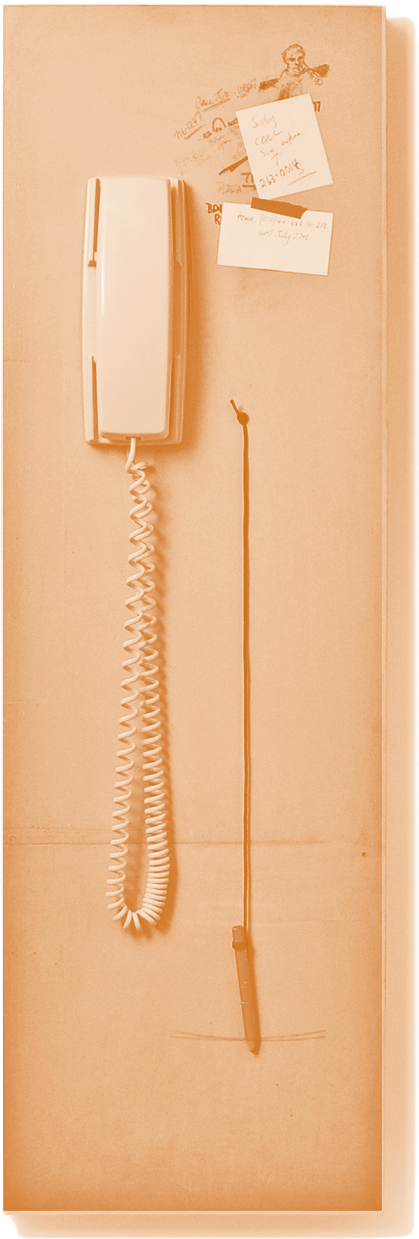
WineLight 2
re-used bottles, re-used MDF, off-the-shelf electrical parts



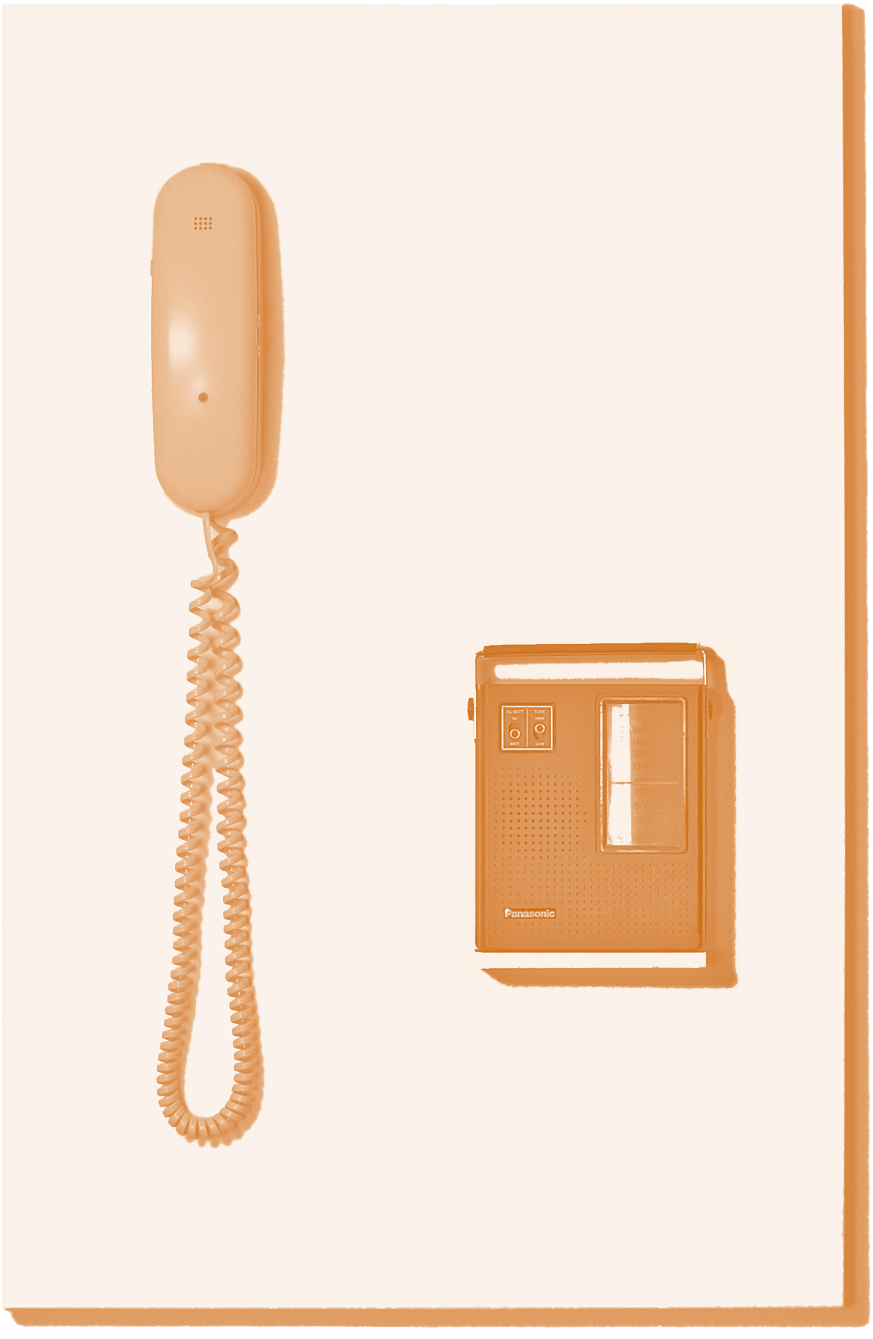
Re-play 1
re-used cassette stereo, re-used MDF, MP3 player

460

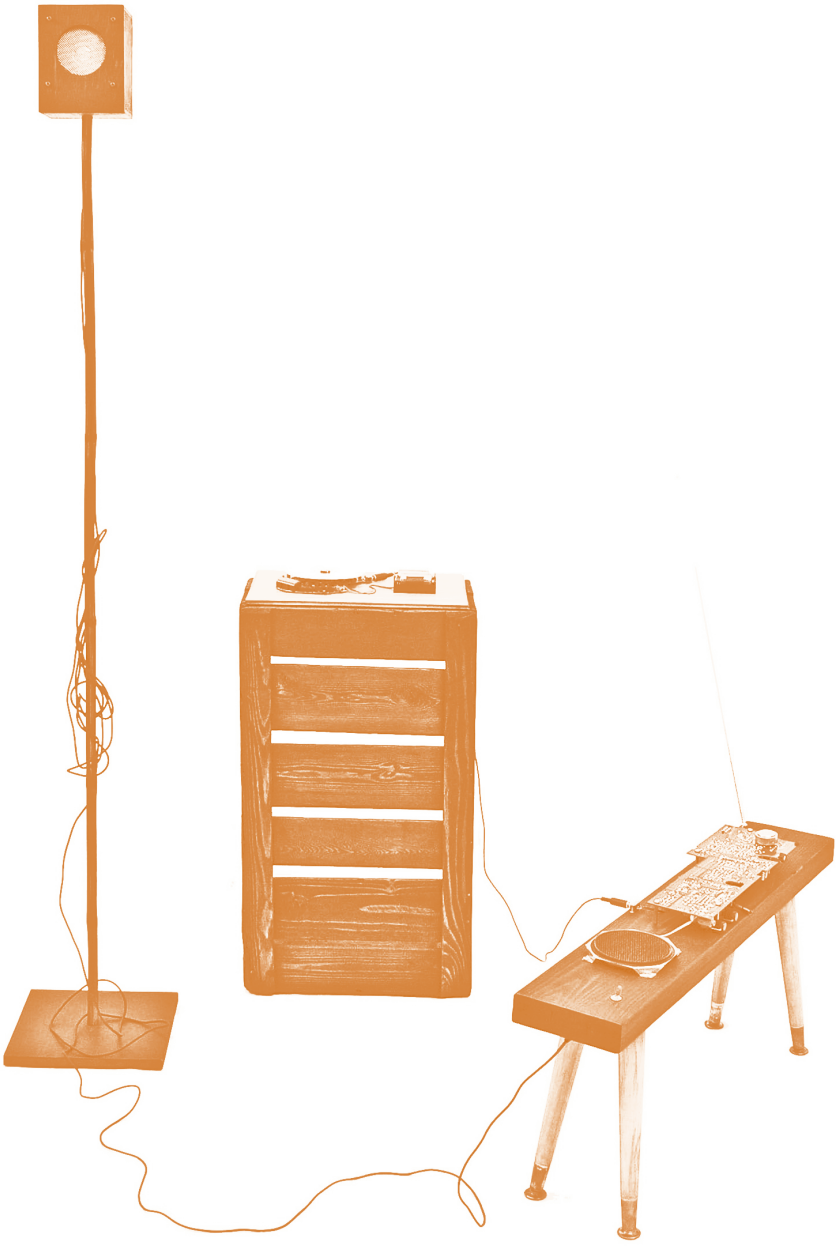
Re-play 2
re-used radio, re-used MDF, MP3 player



Re-call 1
re-used phone, re-used MDF



Re-call 2
re-used phone and radio, re-used MDF

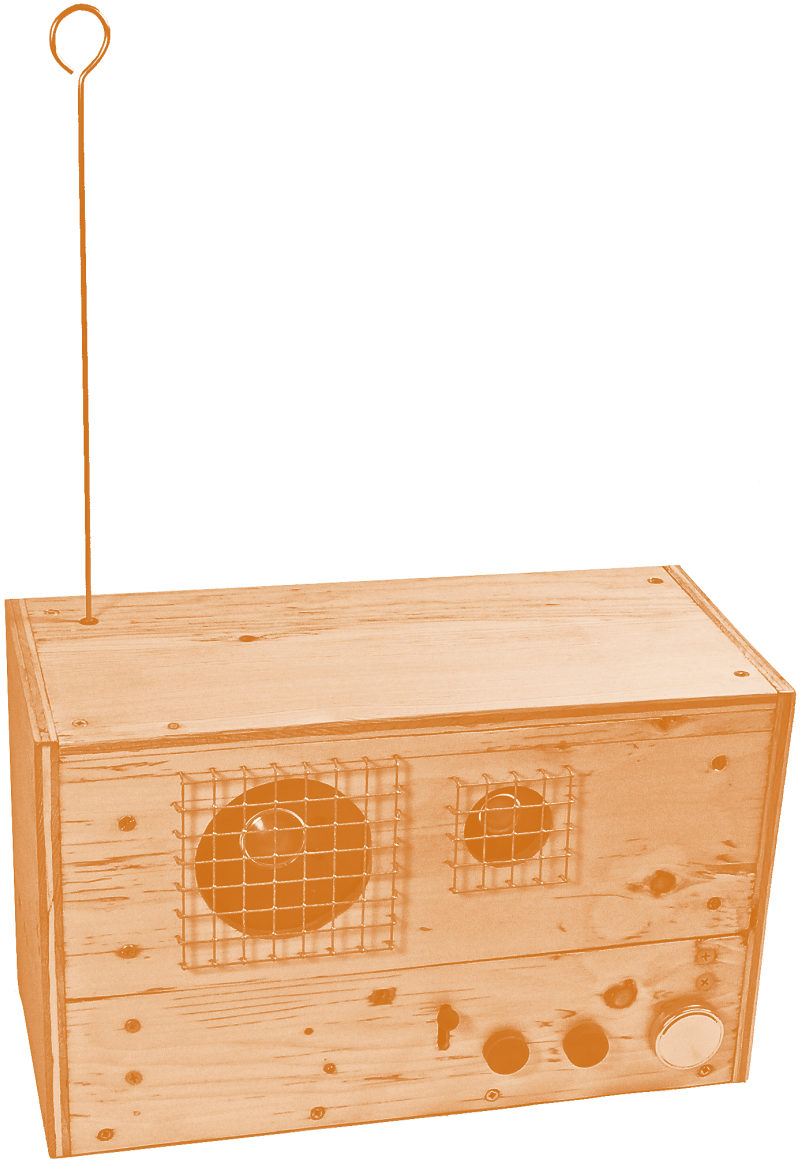


Ensemble Music: a cd-radio player
re-used electrical parts, pine crate, TV legs, threaded rod, re-used MDF and plywood

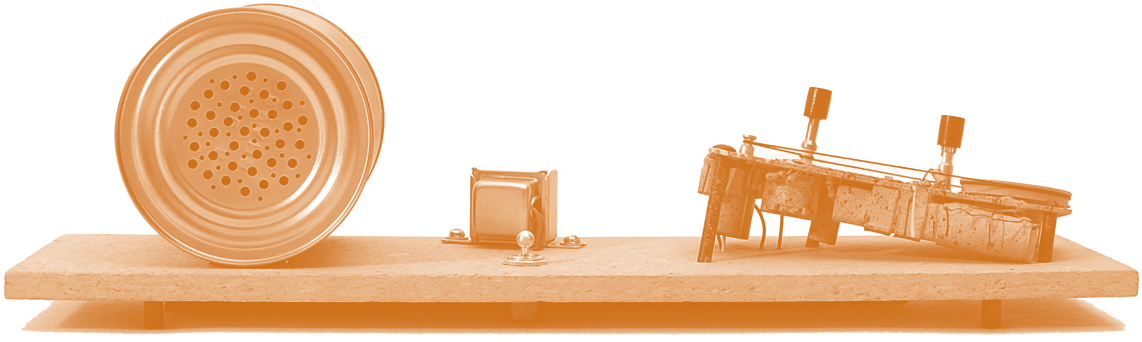
464

Wrapped- CD Player
re-used electronics, plastic bottle caps, paper, garden twine

Music Box
cardboard box, re-used computer speakers, MP3 player

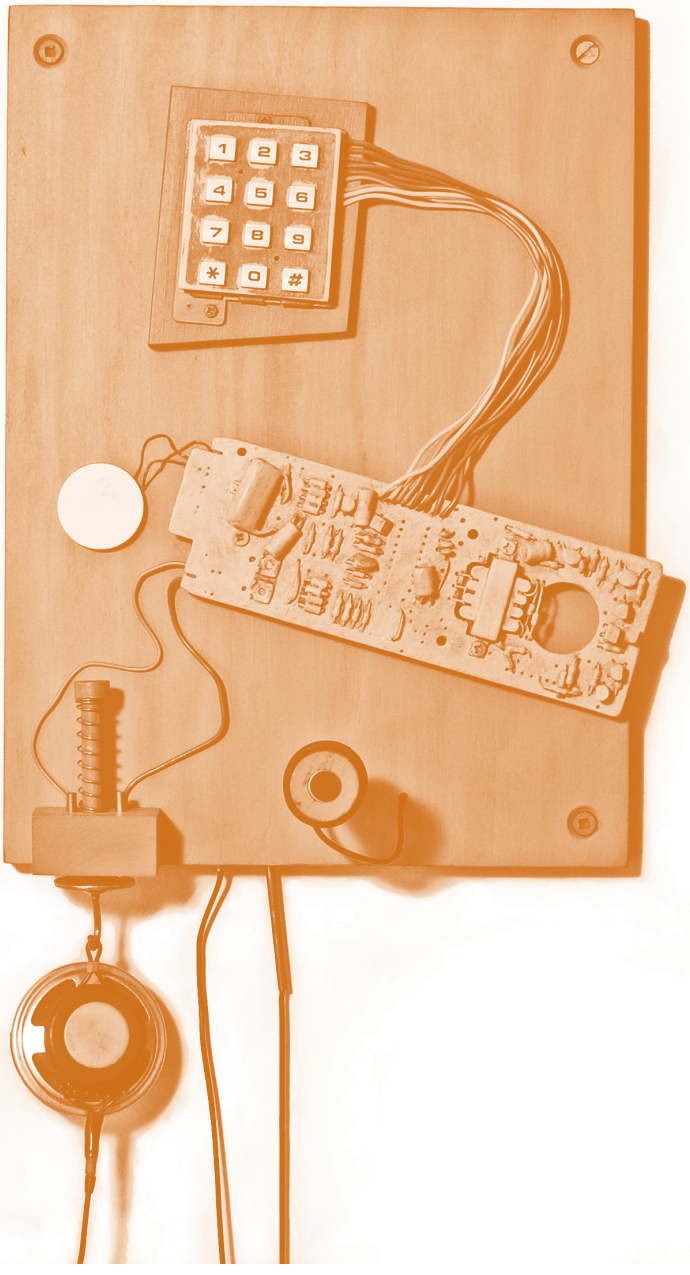


Boy's Own Radio
re-used plywood, re-used electronics

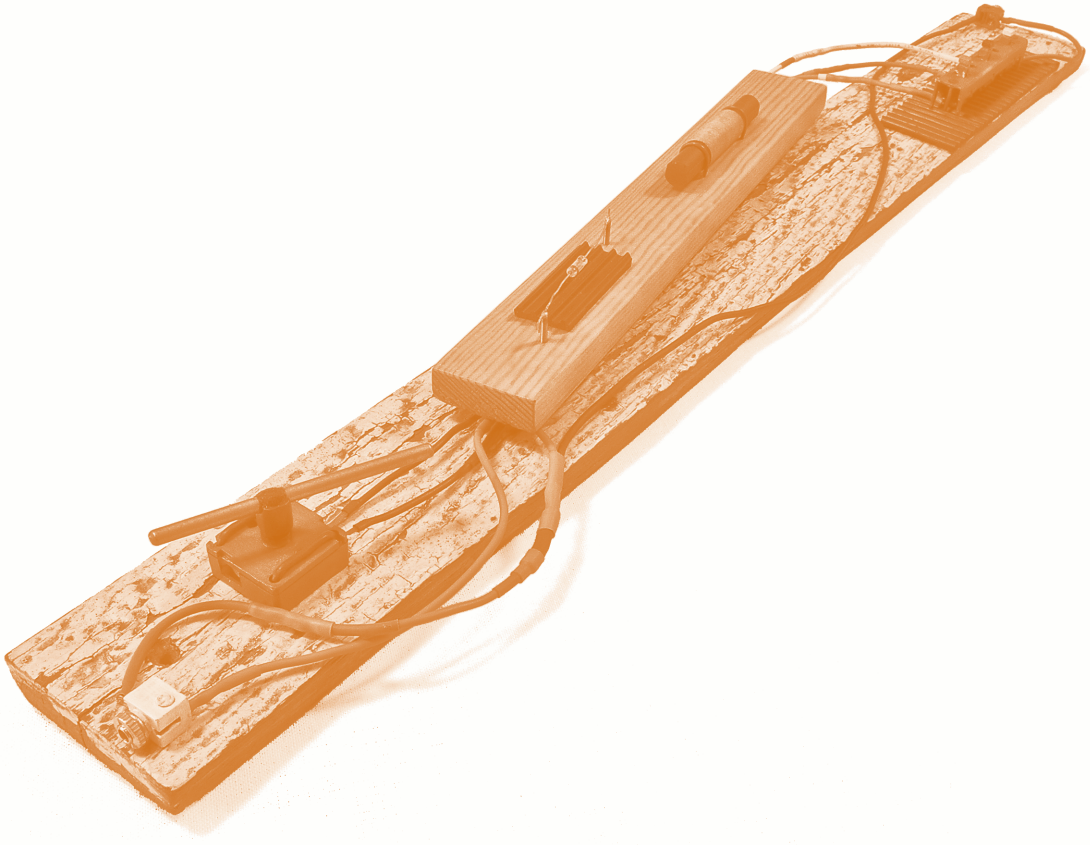


467

Hermit Radio
re-used chipboard, re-used electronics



Wallphone
re-used plywood, re-used electronics



Crystal Radio
re-used pine, new and re-used electronics

memoria humanus
re-used driftwood, re-used USB stick

iKon
re-used oak, re-used hard drive

472

codex morte
re-used driftwood with applied graffiti, silk wrapped, six SD cards, seed beads, hemp cord

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This book was produced using an offset printing process with Sunlit™ soy-based ecological vegetal ink on Paperperfect ® offset paper manufactured by Suzano Papel e Celulose, certified by the Forest Stewardship Council® [FSC®] and with a Carbon Reduction Label, and based on specification PA2050 which measures and regulates greenhouse gas emissions (GHG) and measures the environmental impact throughout the production chain and life cycle of the paper. The ink formula has the percentages of soy oil specified by the American Soybean Association (ASA), and it obeys the CONEG regulations on heavy metals in compliance with standard EN 71/3, which foresees the risk of toxicity of chemical elements. It was printed at Mattavelli Gráfica e Editora, regulated by ISO 9001 and ISO 14001 certification on Environmental Management. The stitching line used in the binding is 33% composed of cotton, and the glue is water-based, free of volatile organic compounds. It was printed in one color [Pantone® 471C], with print covering less than 40% on 90g/m2 offset paper. The scraps remaining from printing paper are sent to recycling. When it is discarded, the mean time for paper decomposition is six months, of the cotton one to five months, and of the vegetal-based ink almost twice as fast as petroleum-based resin. This volume has 490 pages in french binding. Editorial coordination by Maria Cecilia Loschiavo dos Santos, organized by Maria Cecilia Loschiavo dos Santos, Stuart Walker and Sylmara Lopes Francelino Gonçalves Dias, written by 35 collaborating authors, from four countries, working at academic institutions, public and private organizations. The texts were translated by Hedy Hofmann. The typographic families used in the graphic project are Lito and Supria Sans, designed respectively by designers Mateusz Machalski, Polish, and Hannes von Döhren, German, in 2011. The concept and design of the book were done in São Paulo, Brazil by designer Eunice Liu, in 2014.

THIS EXTRAORDINARY COLLECTION EXTRACTS DEEP INSIGHTS INTO THE MOST PRESSING ECONOMIC AND SOCIAL PROBLEMS OF THE 21ST CENTURY THROUGH A WIDE RANGING EXPLORATION OF THE "OTHER" SIDE OF MODERN AND MODERNIZING SOCIETIES: THE PEOPLE AND THINGS ABANDONED IN THE PROCESS, AND THE INTERACTION BETWEEN TWO. BUILDING ON THE PATH BREAKING WORK OF THE EDITOR, DR. MARIA CECILIA LOSCHIAVO DOS SANTOS, THESE WORKS PROVIDE A COMPELLING AND OFTEN INSPIRING PORTRAIT OF HUMAN RESILIENCE AND CREATIVITY AGAINST GREAT ODDS, OF PEOPLE CREATING COMMUNITY AND VALUE, BOTH PRIVATE AND PUBLIC, OUT OF WHAT THE DOMINANT SOCIETY REGARDS AS NOTHING AT ALL. ALONG THE WAY, THIS WORK DEMONSTRATES THAT THE CLEAREST VIEW OF POLITICAL ECONOMY AND OF CULTURE IS OFTEN THAT FROM BELOW.

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ISBN 978-85-62114-34-2
9 788562 114342