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PUBLIC ENVIRONMENTAL MANAGEMENT OF SOLID WASTES: A PRELIMINARY INVESTIGATION TO DEPLOY A PROGRAM OF PAYMENT FOR URBAN ENVIRONMENTAL SERVICES IN MACAÉ CITY, BRAZIL.

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1 INTRODUCTION

The population growth, the industrial development and the accelerated urbanization, linked to society's individualistic attitude have been contributing to the increased use of natural resources and waste generation. Often times, waste returns to the environment improperly, contaminating the soil and the water, bringing about environmental, social and economic losses (MAZZER; CAVALCANTI, 2004). The solid waste management is one of the major challenges in Brazil and in the world. It has become increasingly more important due to the considerable rise in waste generation, as a result of changes in people's habits and the increase of urbanization, income and consumption, which may generate harmful effects on the environment and on public health care.

To cope with the solid waste issue, they passed Law no. 12.305 in 2010. This law established the Brazilian Policy for Solid Wastes (PNRS). It provides for a number of actions aiming to solve the problem of waste management in Brazil. In general, it encourages waste management models grounded on selective collection to provide economic, environmental solutions and solutions to issues linked to the social, economic inclusion of recyclable-material pickers. In light of the PNRS, the actions by the Brazilian government must carry out legal changes to encourage the productive chain of wastes, taking into account how important the many players making it up are.

As a strategy to implement the PNRS, geared towards the strengthening of local clusters involving co-ops and garbage-picker associations, the Brazilian Ministry of the Environment (MMA) is assessing the possibility to charge for urban environmental services linked to the proper management of Urban Solid Wastes (RSU). Urban environmental services can be associated with public services and other urban activities, such as the proper placement of solid waste and urban waste recycling (IPEA, 2010). Paying for the services provided by garbage pickers is a long claim of the Brazilian Recyclable-material Picker Association (MNCR) because of the instability of the recycling market and the lack of regulation mechanisms in this industry, which makes the work of garbage pickers very susceptible to economic variations (MNCR, 2011).

This participatory-qualitative-quantitative research uses as a reference a case study of the city of Macaé, RJ. It aims to characterize the urban environmental service provided by waste pickers in the city, to encourage the promotion of the recycling productive chain, the reintroduction of waste into the productive chain and the reduction of the final volume of the wastes disposed of on Macaé's landfill. The goal is to strengthen, legalize and generate job opportunities and income for the informal players in the productive chain of waste by paying for urban environmental services (PSAu), making the garbage picking activity more economically attractive. In this social, economic setting of accelerated growth in Macaé City, parallel to the need to introduce public policies, including the PNRS, this study proves to be paramount since it is meant to bridge the gap of knowledge about the PSAu. The focus is to crack a practical problem to set up and strengthen picker co-ops, having the city of Macaé as the pilot city, with the potential to replicate such initiative in other cities and towns in Brazil and in upstate Rio.

2 DEVELOPMENT

Given the fragility of the informal players in the waste productive chain, co-ops and associations of garbage pickers must be toughened pursuant to Decree no. 7,405/2010 (BRASIL, 2010). Law 11,445/2007 allows public authorities to hire associations or co-ops of recyclable-material pickers to provide selective-collection services in the city (BRASIL, 2007). Decree 7,217/2010 (BRASIL, 2010) regulates this law and considers garbage pickers to be providers of public solid-waste management services, instead of merely outsourced manpower. Their work reduces costs, increasing landfills' service life. In this setting, many efforts have to be made so that the productive inclusion of recyclable-material pickers and their structuring can further contribute to the recyclable-material reintegration chain. The show is an alternative instrument to promote, encourage and strengthen the social players in the productive chain of waste, since it aims to spark

the level of formalization in co-ops, encourage the increased efficiency and to increase the chance of success of co-ops in the medium and long runs.

Macaé city, known as the capital of oil in Brazil, has 206,728 inhabitants. It is divided into 44 neighborhoods and 6 districts. It generates approximately 6,330 tons/month, 208 t/day, 0.98 kg/inhabitant a day of wastes (IBGE, 2010). Today this waste is discharged into a landfill, in spite of its high added-value and potential to generate job opportunities and income. As per Dias (2011), due to the great population growth resulting from the installation of the oil extraction and production center in the city, Macaé produced 89 tons/day of waste above the expected threshold in the performed studies to carry out Macaé's landfill. These additional 89 t/day will reduce the landfill's service life and may bring to life hard-to-solve problems.

As per Freesz (2010), Macaé's local administration outsources the collection, transportation and discharge of its urban solid wastes (RSU). It also runs the landfill. In the city, there is a minor operation by self-employed garbage pickers and scrap-material pickers, who perform the selective collection of wastes at source, having no employment link with the city's administration. Freesz (2010) says that "Macaé still does not perform the integrated management of wastes (implementation of the selective collection and a program of environmental education aiming to reduce, reuse and recycle wastes), in spite of performing the proper discharge of the RSU in a licensed landfill". Feitosa (2014) says the lack of a licensed plant to screen recyclables in Macaé prevents co-ops and associations of garbage pickers from being given a credit line and tax incentives, especially in the public sector. Feitosa (2014) points out at the need to change the local management of solid wastes in the city of Macaé, by introducing public measures to push selective garbage collection, including low-income manpower and providing incentives to use environmental practices aiming at streamlining natural resources, reducing waste and advancing for sustainability.

The issue of waste management has a strong economic and political bias. In spite of the guidelines, targets and deadlines set by the PNRS in many cities, because of political or economic interests, recycling is neither encouraged nor prioritized. In Macaé, selective collection is still below the legal expectations enforced by the PNRS. Little robust public initiatives do not suit the city's economic profile. If compared against other existing income generation alternatives, garbage collection does not stand out as an attractive activity. As per Damásio (2010), the average income of recyclable-material pickers in the State of Rio is nearly R\$ 519.85 lower than the minimum wage of R\$ 724.00. In Macaé, according to reference data of the Ministry of Labor and Employment (MTE), by means of the General Record of Employed and Unemployed Personnel (CAGED), the average wage earned by workers having a formal employment relationship is R\$ 3,715.37, the highest in the State.

Society's well-being depends mostly on the environmental services provided by nature. Despite the several definitions for the Payment for Environmental Services (or PSA in Portuguese), one of them is widely used and defines it as "a voluntary transaction, in which a well-defined environmental service or a land use ensuring this service is acquired by at least one buyer from at least one provider, under the condition that it ensures the service provision (conditionality)." (WUNDER, 2005). The PSA systems occur in a diversity of settings and in many different ways. The phrase "urban environmental service" is already used in the literature targeted at urban services interfacing with the environmental issues.

Urban environmental services can be associated with public services, as well as with other city activities like the proper disposal of solid wastes and the recycling of urban wastes. In this line, paying for urban environmental services (PSAu) is linked to the activities performed in the urban setting generating positive environmental outcomes or minimizing negative environmental outcomes, from the perspective of natural-resource management, risk reduction and the enhancement of ecosystemic services. Thus they will be able to partially correct market failures related to the environment (IPEA, 2010). The focus of urban environmental services and the PSAu mechanisms is recycling, more specifically the solid urban-waste picking and screening activities performed by recyclable-material pickers (IPEA, 2010). After they decide on the focus of the PSAu mechanisms to be proposed, the assumptions steering the instruments will then be looked into. The major assumptions are: (i) payment must be addressed to garbage pickers co-ops instead of garbage pickers individually; (ii) payment must have the provided service as counterpart; and (iii) the mechanisms must award efficiency in delivering the environmental service. Report proposals have been put together to achieve the following goals: (i) raise the average income of garbage pickers; (ii) reduce the floating prices paid to garbage pickers for recyclable materials; (iii) encourage the degree of formalization in co-ops and increased efficiency; and (iv) increase the chance of success in co-ops in the middle and long run (IPEA, 2010). The three PSAu instruments are: (i) payment on productivity; (ii) the policy of minimum prices for recyclable materials, in the form of graduated compensatory addition instruments; and (iii) the cooperative fund (credit fund). The three proposed instruments aim to contribute to overcome the challenges faced by recyclable-material picker co-ops, particularly to raise their average revenue, reduce their revenue variation and enable mid- and long-term structural improvements to be achieved.

Given the previous facts and circumstances, we understand that a PSAu scheme should not replace other social policies in their broader goal. They should serve synergically to one of its most critical points: increase income (IPEA, 2010). As for the Brazilian guidelines to implement the PSAu, only the State of Minas Gerais has succeeded in setting up legal mechanisms. Established by

Act no. 19,283, of November 22, 2011, providing for the award of a financial incentive to recyclable-material pickers, called the Recycling Benefit, and regulated by Decree no. 45,975, of June 4, 2012, establishing rules to award financial incentives to recyclable-material pickers, the legal nature of the Recycling Benefit is that of a financial incentive for the counterprovision of environmental services, in order to minimize waste volume build-up and the pressure on the environment.

Due to the scarcity of references on the PSAu in the world literature, other possible mechanisms to increase the income of recyclable-material pickers such as the *tradable development rights* (TDR) or negotiable or tradable development rights, a device that is becoming more and more popular worldwide, have been investigated. This mechanism is applied to encourage the reduction of the development in areas that should be preserved, called outcoming areas, and to stimulate the development in the expected areas according to the city's district division called incoming areas. The owners of outcoming-area lands earn a compensation (TDR) due to the restrictions of development in the area. This TDR is paid by the owners of the incoming areas and is subject to market demands. The TDR could be associated to the PSAu, as a mechanism to collect funds to make up a credit fund for the PSAu. The rationale is to have the companies benefiting from the sending of raw material pay pickers a compensation for the service they provide (SANTOS, 2012), or have the businesses in the new Industrial Areas (ZI) or the Urban Growth Zones (ZEU) pay a fee to develop their business and turn those amounts into a credit fund for the PSAu.

3 FINAL REMARKS

In this study, we investigated some existing experiences of introducing the PSAu in Brazil and in the world, and the indication of a methodological procedure to propose a PSAu program.

This study evolved to identify in the Brazilian legislation the indication of the need to enable the introduction of political instruments to manage solid wastes, aiming to bring recyclable-material pickers into mainstream productive chain. It also aims to structure those groups so they can further contribute to the recyclable-material reintegration chain, supporting the PSAu proposal as an strategy to implement the PNRS, targeted at strengthening local clusters involving co-ops and associations of garbage pickers. In Brazil, only the State of Minas Gerais introduced a PSAu program called the Recycling Benefit. This benefit can be used as a reference to suggest a program to Macaé City. In this setting of few references on experiences of PSAu in Brazil and in the world, other instruments other than the PSAU can be analyzed.

After deciding on the payment criteria, possible sources of funding and elements to put together a PSAu program in the city of Macaé, evaluating (current and potential) benefits generated by the recycling of major recyclables in Macaé can have clarifying outcomes. The analysis of secondary data to get primary data will be the basis to suggest a program of payment for urban environmental services associated with other income-raising mechanisms to pay Macaé's recyclable-material pickers.

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