Major Characteristics of Hazardous Waste Management in Brazil

Isis Arend da Silva [1], Luís Paulo Sant'ana[2]

[1]Graduanda em Ciências Biológicas, Pontifícia Universidade Católica do Rio Grande do Sul - Porto Alegre/RS. E-mail: isisarend@gmail.com
[2]Mestrando em Biologia Animal, Universidade Federal dos Vales do Jequitinhonha e Mucuri - Diamantina/MG. E-mail: luispsant@gmail.com

Abstract

Brazil, the seventh economy in the world, is a member of the Basel Convention, but the country has specific legislation of waste management. Brazil has three classifications for hazardous waste: Hazardous Waste- Class I, Non Inert Waste- Class IIA and Inert Waste- Class IIB. In relation to the final destiny of the hazardous waste is not clear in and there is no data informing the total cost of implementation of the National Policy of Solid Waste in Brazil. Brazil has been managing hazardous waste since before the establishment of the Basel Convention. However, the control was poor and non-unified, since the nation has clear non knowledge about the amounts of hazardous waste produced. The lack of control in Brazil was focus of the biggest accident with hazardous waste in this country. This study presents the current situation of hazardous waste management in Brazil, based on the most recent available information.

Keywords: Basel Convention, hazardous waste, waste legislation

Principais Características da Gestão de Resíduos Tóxicos no Brasil

Resumo

Brasil, a sétima economia do mundo, é um membro da Convenção de Basileia, mas o país tem legislação específica de gestão de resíduos. O Brasil tem três classificações para resíduos perigosos: Resíduos Perigosos - Classe I, Resíduos Não Inertes - Classe IIA e Resíduos Inertes – Classe IIB. Em relação ao destino final dos resíduos perigosos, esta não é clara e não há dados que informam o custo total da implementação da Política Nacional de Resíduos Sólidos no Brasil. O Brasil tem gerido os resíduos perigosos desde antes da criação da Convenção de Basileia. No entanto, o controle era pobre e não unificado, uma vez que a nação não tem conhecimento claro sobre as quantidades de resíduos perigosos produzidos. A falta de controle no Brasil foi o maior foco de acidente com resíduos perigosos no país. Este estudo apresenta a situação atual da gestão de resíduos perigosos no Brasil, com base na informação disponível mais recente.

Palavras chave: Convenção de Basileia, resíduos tóxicos, legislação de resíduos

1 Introduction

According to World Bank (2014) Brazil is the seventh economy in the world, presenting a population of 200.4 million and a land extension of 8.515.767, 049 Km^2 (IBGE, 2014). Commonly Kwon for beautiful beaches, Carnaval's Party and for its high biodiversity; and a part of the biggest rain forest in the world, Amazônia, belongs to the Brazilian territory. Furthermore, environmental issues in Brazil are a great issue, it is a ruge country, which makes the development slow, and one of the major problems is the waste disposal, as in the rest of the world (BRAZIL, 2014). This study is going to present the current situation of hazardous waste management in Brazil, based on the most recent available information.

2 Existing hazardous waste management system Institutional and financial aspects

Brazil is a member of the Basel Convention, but the country has specific legislation of waste management. Conselho Nacional do Meio Ambiente or National Board of Environment (CONAMA) N° 452/2012- Which agrees with the Basel Convention about the import and export of Hazardous Waste and its deposit. Brazil presents three classifications for hazardous waste:

- Hazardous Waste- Class I: that ones in any category in Annex I, since they do not have any of the characteristics described in the Annex III, II and IV.
- Non Inert Waste- Class IIA: that ones whose do not fall in- Class I or Inert Waste- Class IIB.
- Inert Waste- Class IIB: any waste that when shown in a representative way, according to the Association of Brazilian Norms, and submitted to dynamic and static contact with distilled or deionized water at room temperature, they do not suffer any alteration to the water quality, according to the Association of Brazilian Norms.
- Other Wastes: according to Annex II of the Basel Convention.

The legislation presents the Annex I, II, III and IV of the Basel convention; establishes that the transport of Hazardous Waste need to follow international, national and states laws; determines that the list in the Annexes can be extended; put in place the IBAMA (Institute of the Environment) as the responsible for the authorizations of import and export; establishes that the import of Class I waste is prohibit, and others types are controlled by the IBAMA; and also determines that the storage, handle, use, reprocessing and final disposal is determined in national, state and municipal

legislations. In this case the national Law 12.305/2010- National Policy of Solid Waste, is responsible for the storage, transport, handle, use, reprocessing and final disposal.

The Law 12.305/2010 has other waste classification, it brings fourteen categories, under each one the specific legislation for management of waste. The final destiny of the hazardous waste is not clear, it just determine that the companies which present this type of waste may have a register in a national system under IBAMA jurisdiction, and may have a Hazardous Management Plan. Furthermore, about the final destination of the Hazardous waste, the legislation just determine that the firm is responsible for finding the correct destiny, it does not specify what is a final correct destiny.

There is no data informing the total cost of implementation of the National Policy of Solid Waste in Brazil. The only prevision is an estimative of the cost of final dispose of garbage in sanitary dumps for waste in general, that is R$ 54,25/ton (for cities with less than 100 thousand habitants) that is more or less equivalent to AUD 26,00/ton, R$ 35,56/ton (for cities with more than 100 thousand habitants) that is more or less equivalent to AUD 16,00/ton and R$ 33,06/ton (for cities with more than 1 million habitants) that is more or less equivalent to AUD 13,00. Moreover, the government inform the sources of investment of the Policy, such as private sector and national funds of investment (Ministério do Meio Ambiente & Secretariado para América do Sul-Escritório de Projetos do Brasil [MMA & ICLEI-Brasil] 2012, PRS 2014).

3 Hazardous waste generation and physical characteristics

According to CONOMA nº 313/2002 that establishes a Nacional Inventory of Industrial Solid Waste that should generate data about the waste generation and physical characteristic and present these data to the IBAMA, environmental organ, which is responsible for stablishing the format of information. Besides, industries should keep monthly registers of generation to the National Inventory. Although, IBAMA had three years from the establishment of this resolution for elaborating the National Inventory, so far the data in most states are unavailable, incomplete or of difficult access.

The only data of waste generation found was about Industrial Solid Waste, that according to CONOMA nº 313/2002 art. 2, Industrial Solid Waste is defined as all waste that result of industrial activity and is on solid, semi-solid, gaseous – when contained or liquid- which its particular characteristics become its disposal in the public waste net unfeasible or for do this technic solution is needed or is economically unfeasible with the best technology available. Are also included in this definition all waste from treatment system plants of water or those generated in equipment and plants of pollution control.

The most updated data was found in a report of the Institute of Applied Economic Research (IPEA, 2012). Even that outdated information was found for 10 out of 26 states in Brazil (Table 1).

Table 1: States with available information

States	Year of Inventory
Acre	2002
Amapá	2005/2007
Ceará	2001
Goiás	2009
Minas Gerais	2002
Paraiba	2009
Pernambuco	2001/2002/2003
Rio Grande do Sul	2002
Rio Grande do Norte	2002/2003

Source: Table adapted from (IPEA 2012)

The IPEA (2012) reports that many of the states did not followed the resolution and did the inventories according to their own classification of industries type or suppressed some industries. Furthermore, in the inventories were used the old classification of Hazardous Waste instead of the current one. In table 2 is represented the available data for generation of Hazardous Waste in Brazil, for states that developed some kind of Solid Waste Inventories and in table 3 there are more three states, that the data is given by Associação Brasileira de Empresas de Tratamento de Resíduos or Brazilian Association of Companies of Waste Treatment (ABETRE), a report of 2003 is the only one available.

Table 2: Hazardous Waste Generation in Brazil per state from Solid Waste Inventories (ton/year).

State	Hazardous Waste (ton/year)
Acre	5.500
Amapá	14.341
Ceará	115.238
Goiás	1.044.947
Minas Gerais	828.183
Paraiba	657
Pernambuco	81.583
Rio Grande do Sul	182.170
Rio Grande do Norte	3.363
Total: 1887.378	

Source: Table adapted from IPEA (2012).

Table 3: Hazardous Waste Generation in Brazil per state from ABETRE (ton/year).	
State	**Hazardous Waste (ton/year)**
Pará	634.543
Rio de Janeiro	293.953
São Paulo	535.615
Total: 1464.111	
Source: Table adapted from ABETRE (2003).	

4 Prediction of future waste quantities

The implementation of the National Policy of Solid Waste aim do not increase the quantities of waste produced in Brazil, predicting keep the current production or in the best scenery reduce the quantity of waste produced (MMA & ICLEI-Brasil, 2012, PRS 2014).

5 Major problems and issues

The law 12.305/2010 prohibit the existence of dumps a major problem in Brazil given the marginalization of workers or "pickers". Furthermore, the dumps that are current found in Brazil are not framed in international rules; they are dumps in open space where the material react releasing toxic substances and gases contaminating the soil and endangering the "pickers" (PRS "b" 2014). Moreover, in 1987 the lack of control in Brazil was focus of the biggest accident with hazardous waste in Brazil, the accident happened in the city of Abadia in Goiás, when "pickers" opened a machine of radiotherapy and found a bright rock inside, this rock was cesium-137, four of them died just after contact, and the rejects of that reached forty tons of hazardous waste, resulted of nineteen grams of cesium (CARVALHO, 2012).

6 Conclusion

In conclusion, the topics above clearly show the fact that Brazil is just establishing properly legislation for implementation and control of solid waste including hazardous waste. Even Brazil has been managing it since before the establishment of the Basel Convention, the control was poor and non-unified, since the nation has clear non knowledge about the amounts of hazardous waste produced in the country. Accidents

with waste in Brazil are clearly resulted from the lack of control of the federal government, resulting in insecurity for the population, mainly for the "pickers".

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This is a documentary produced in my city about an isle where people live from dumps.