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Regulation of solid waste management at Brazilian ports: Analysis and proposals for Brazil in light of the European experience

Cristiane Jaccoud *, Alessandra Magrini

Instituto Alberto Luiz Coimbra de Pós-Graduação em Engenharia (COPPE), Programa de Planejamento Energético e Ambiental (PPE), Universidade Federal do Rio de Janeiro (UFRJ), Brazil

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ABSTRACT

With a coastline of 8500 km, Brazil has 34 public ports and various private terminals, which together in 2012 handled 809 million tonnes of goods. The solid wastes produced (from port activities, ships and cargoes) pose a highly relevant problem, both due to the quantity and diversity, requiring a complex and integrated set of practices resulting from legal requirements and proactive initiatives. The main Brazilian law on solid waste management is recent (Law 12,305/2010) and the specific rules on solid waste in ports are badly in need of revision to meet the challenges caused by expansion of the sector and to harmonize them with the best global practices. This paper analyzes the current legal/regulatory framework for solid waste management at Brazilian ports and compares this structure with the practice in Europe. At the end, we suggest initiatives to improve the regulation of solid wastes at Brazilian ports.

1. Introduction

Seaborne transport has always been the main means of global trade. The globalization of markets and intensification of international transactions in the past 30 years has dramatically increased the flow of goods, requiring the expansion of port facilities. It is estimated that maritime transport handles over 80% of global trade by volume and 70% by value, far ahead of air and land transport (UNCTAD, 2011).

In Europe, the port sector has great importance in the movement of cargoes and people. The annual cargo movement at the 27 main European maritime ports between 2002 and 2008 fluctuated in the range of 3.9 billion tonnes (metric tons). Despite a sharp decline in 2009, this volume recovered to 3.7 billion tonnes in 2011 (EUROSTAT, 2013).

In Brazil, the port sector has shown impressive growth in recent decades. According to data from the National Waterway Transport Agency (ANTAQ, 2012), considering both maritime and fluvial transport, the movement at the country's ports rose from 306 million tonnes in 1990 to 904 million in 2012 at maritime, river and lake ports.

More than 90% of this movement occurs at maritime ports and terminals. According to statistics from Brazil's trade balance (MDIC, 2012), in 2012 seaborne transport accounted for 80% of the country's international trade flow by value and 95% by weight.

This growth of the port sector coincides with rising concern in recent years over proper environmental management of productive activities in general. This trend can be noted in the port sector, both in Brazil and internationally, although more timidly than in many other sectors. The result has been an advance in both regulations and in voluntary initiatives.

In Europe, mention can be made of the initiatives of the European Sea Ports Organisation (ESPO) to incorporate questions of environmental sustainability of ports along with safety, security and efficiency. In 1994, the ESPO established the first European Environmental Code of Practice for the sector (ESPO, 1994). Another important contribution has come from the works developed by EcoPorts, also dating to 1994, which is a network of professionals from various European ports committed to exchanging viewpoints and developing tools and methods to improve the sector's environmental performance. It has been incorporated in ESPO since 2011.

Mention should also be made of the Ecoport Project, launched by the Valencia Port Authority in Spain in 1998, financed by the European Union's LIFE Program. This initiative led to the implementation of an Environmental Management System at Port Installations (APV, 2001, 2011).

In the Americas, port sustainability has been addressed by the American Association of Port Authorities (AAPA), representing the managing bodies of public and private ports in the United States, Canada, Latin America and the Caribbean, established in 1930. In 1998 the AAPA issued its "Environmental Management Handbook" (AAPA, 1998), a manual that provides guidelines to port operators on management of the most critical environmental

* Corresponding author. Tel.: +55 021 3619 6800/6700.
E-mail address: cristiane.jaccoud@gmail.com (C. Jaccoud).

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Table 1
Top 10 environmental priorities of the European port sector over time. *Source:* Adapted from ESPO (2009).

Priorities	1994	2004	2009
1	Port development (water)	Garbage/Port waste	Noise
2	Water quality	Dredging operations	Air quality
3	Dredging disposal	Dredging disposal	Garbage/Port waste
4	Dredging operation	Dust	Dredging operations
5	Dust	Noise	Dredging disposal
6	Port development (land)	Air quality	Relationship with local community
7	Contaminated land	Hazardous cargo	Energy consumption
8	Habitat loss / degradation	Bunkering	Dust
9	Traffic volume	Port development (land)	Port development (water)
10	Industrial effluents	Ship discharge (bilge)	Port development (land)

problems and recommendations on low-cost practices to reduce impacts. In 2007, the AAPA strengthened its sustainability guidelines with the creation of the Port Sustainability Task Force (AAPA, 2007).

In Brazil, in 2011 the National Waterway Transport Agency (ANTAQ) published a compilation of the most relevant environmental questions facing the port sector, under the title "Porto Verde" ("Green Port"). Although timid, this work at least presents some orientations for the sector (ANTAQ, 2011a).

Within the scope of port environmental management, an important aspect is management of the wastes generated by operational activities, vessels and cargoes. Although wastes from ships are the focus of most international regulations, such as those of the International Maritime Organization (IMO), the entity of the United Nations responsible for the safety of navigation and prevention of pollution caused by ships, several developed countries have implemented policies in the form of regulations and proactive initiatives by sector associations and port authorities.

In Europe, for example, that concern is evidenced by the definition of environmental priorities for ports, prepared every five years by the ESPO, as shown in Table 1. In 1996 wastes did not even appear on the list of these environmental concerns, while in 2004 they were at the top of the list and in 2009 they were still were ranked third, showing the high priority of the question.

Darbra et al. (2004), in analyzing this variation of environmental priorities, explains it as a reflection of the heightened awareness and actions taken in response to stricter environmental legislation and regulations.

According to Olson (1994), the regulations on management of operational wastes are frequently national or local. In turn, the wastes generated by ships are regulated, for the signatory countries, by MARPOL Convention 1973/1978, which establishes an international classification for the main wastes produced by vessels, besides rules on the need for port installations to receive them, requiring the signatory countries to issue internal rules on the precepts established.

In the European Union, the MARPOL guidelines were regulated by Directive 2000/59/EC (EC, 2000), covering the means for receiving the wastes generated by ships and cargoes at ports. According to the ESPO (2009), this significantly contributed to the change in the ranking of wastes among the environmental priorities of ports between 2004 and 2009. In the same sense, Carpenter and Macgill (2003, 2005), in analyzing the compliance of North Sea ports in relation to receiving these wastes, observed a gradual increase in compliance starting with the enactment of the directive

In Brazil, the implementation of adequate management in line with the regulations on the matter still needs considerable improvement. Murta et al. (2012), in analyzing Brazilian ports, found that management of solid wastes still is not consolidated, even though it is covered by international conventions and national policies, such as the legislation on the environment and sanitary surveillance.

According to the National Waterway Transport Association (ANTAQ, 2011a), the wastes from ships and port activities are the main factors causing an environmental impact by ports. In a recent initiative, the Secretariat of Ports of the Presidency of the Republic (SEP/PR) has since 2012 been developing the "Program for Conformity of Management of Solid Wastes and Effluents at Brazilian Maritime Ports", with the goal of inventorying the wastes generated by these ports and proposing improved management practices.

On the matter of regulation of waste at ports, Brazil suffers from a succession of sometimes conflicting rules and a complex and overlapping institutional structure with responsibility for the sector, which hampers consensus in the definition of institutional roles and improvement of rules. Therefore, the objective of this article is to analyze the regulatory and institutional structures pertaining to management of solid wastes at Brazilian ports and to compare them with the legal and voluntary initiatives in the European Union, to identify aspects that can be improved in the country. For that, this article relies on the studies of the legislation and best practices carried out under the ambit of the referred "Program for Conformity of Management of Solid Wastes and Effluents at Brazilian Maritime Ports" (Magrini et al., 2012).

The pertinence of this article is also associated with the recent changes in Brazilian legislation on solid waste management in general (through enactment of a new law in 2010) and in the regulatory framework for the port sector, in 2013. In turn, the choice of the European Union for comparative purposes and to propose improved practices for Brazil is justified by the maturity and good results achieved by application of the European Directive on the matter, as well as the proactive initiatives of the ESPO.

2. Brief sketch of the Brazilian maritime port sector

With a coastline of some 8500 km, Brazil has a port system undergoing rapid expansion and modernization in response to the steady growth of international trade (especially export of commodities) over the past two decades). The country's port facilities fall into two categories, Organized Ports and Private Use Port Terminals.

According to Law 8,630/93 (Brasil, 1993), combined with Law 12,815/13 (Brasil, 2013), Organized Ports are public-sector facilities equipped for the movement of passengers and/or cargoes and storage of goods. These services are rendered by private port operators, holding concessions or leases, granted by public tenders, against payment of the respective fees, with the charges to the public subject to regulatory control. Depending on the features of the port, the terminals can be operated by more than one company.

In turn, Private Use Terminals are port installations located in the areas of organized ports, operated by private parties through authorization upon signing an adhesion contract, preceded by a public call for proposals, which is simpler than a full-blown tender process.