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Management

INTEGRATED ENVIRONMENTAL MANAGEMENT IN THE CONTROL OF MARINE EXOTIC SPECIES IN PORT AREAS

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ABSTRACT Port activities are complex because of the large flow of ships and activities that take place. With this, several impacts to the environment are generated, among them an introduction of exotic marine species can be highlighted, which can cause extinction and substitution of the native species. In this context, port environmental management appears, in an integrated and participatory way, to solve this problem. This research seeks to reconcile all participants and regulatory and / or regulatory bodies, valuing their competencies and incorporating them to guarantee the efficiency of the processes. Thus, this research sought to highlight the importance of Integrated Environmental Management as a proactive mechanism for the introduction and management of exotic species in port areas. It was possible to note, according to a literature review, that it is an urgency in the implementation of this tool, adopting preventive strategies, due to the increasing problem of bioinvasion.

KEYWORDS : Bioinvasion; Ballast Water; Port Management; Alien species.

INTRODUCTION

Historically, the relationship between man and the environment has always been marked by the intense use and modification of ecosystems, always resulting in policies that are more reactive to environmental problems than those that prevent them. According to Petts (1999), despite the new contours attributed by the concept of development sustainability, the perception of antagonism between economic development and environmental protection remains. Therefore, we have invested in management tools that seek to minimize these impacts in order to end the idea of antagonism between these two themes.

Kitzmann and Asmus (2006) explains the importance of a set of administrative and operational programs and practices aimed at protecting the environment, the health and safety of workers, users and communities. This group is called Environmental Management. It also seeks economic measures, such as investments, in addition to its institutional and legal potential, with the objective of maintaining or recovering the quality of resources and social development (Campos; Selig, 2002). According to Koehler and Asmus (2010), the problem is how to make environmental management feasible in the face of the regulatory and institutional framework that governs the exploration of ports, where several organizations with the most varied functions interact in the same space.

At the same time, in this context, the port areas present an intense anthropic activity, which does not just refer to the handling of cargoes. Several processes with environmental consequences are developed, and these consequences often go beyond the legal limits of these ports (AAPA, 1998). As a means to control these possible problems, Port Environmental Management has emerged. According to Souza (2000), Brazilian environmental policies are based on an instrument of command and control, and thus, their work is more reactive to environmental adversities.

Among the main impacts caused by ports, the introduction and establishment of these species due to the demarcation of vessels in the territorial sea and the inland waters or port facilities (Obregon; Fabriz, 2015) stands out. This introduction, or bioinvasion, is caused by the establishment of plants or animals in regions outside their natural occurrence area, these individuals may also be known as invasive alien species (Souza, 2010; Farrapeira et al., 2007). Threatening native species, resulting in an imbalance of the ecosystem. This invasion of a species becomes a major problem, since efforts to eradicate it are costly and often ineffective, especially in marine species (Staples; Cowie, 2004).

According to the Brazilian Ministry of the Environment (MMA, 2006), invasive alien species are considered the second largest cause of extinction of species on the planet, directly affecting biodiversity, human health and the economy. Being considered a growing global phenomenon, that affects the environmental and socioeconomic areas of a region. Collyer (2007) says that when there is a marine oil accident there are measures to counteract the problem immediately, however, damage caused by exotic organisms may be irreversible, since many of these organisms are not in the habitat in which they were inserted Given that Brazilian port management is usually reactive when dealing with responsibilities in controlling the introduction of exotic species, it is necessary to develop tools that can more effectively apply existing policies, because according to Lourenço (2012), environmental management in Port areas is still below the environmental ideal. Thus, this study sought to highlight the importance of Integrated Environmental Management as an instrument to prevent the introduction and management of exotic species in port areas.

MATERIALS AND METHODS

For the development of this study, the indirect data collection method was used, through bibliographical and documentary research, verifying studies and documents that portray the importance and viability of Integrated Environmental Management in port areas. After this survey, a check was made on the main articles and other technical-scientific productions on issues related to bioinvasion and management of exotic species, for a better analysis of this tool in the port context.

Criteria for selection of bibliography

For the selection of articles that composed the bibliographical review of this article, searches were done in three bibliographic databases: SciElo, ResearchGate and the Portal of Periodicals of CAPES. When finalizing the searches at each base, the repeated references were deleted. We sought to select articles published between 1996 and 2016, written in English, Portuguese and Spanish.

In the process of indexing in the bibliographic database, we opted for the search for controlled vocabulary (descriptors). The terms Integrated Environmental Management and Management of Exotic Species were combined with: bioinvasion, port management, environmental responsibility, public policies, in the three languages chosen. The combinations obtained allowed the formation of topics that constituted the chapters described in the results and discussion

presented in this article.

Criteria for selecting documentary data

When using documents, to extract information, an investigation is necessary, following steps and procedures, organizing information to be categorized and later analyzed (Sá-Silva; Almeida; Guindani, 2009). Thus, for the documentary research was used Snowball, or "snowball" method adapted from Baldin and Munhoz (2011), where after the choice of the first materials to be used, through them are quoted or indications of other Sources on the same topic to increase sampling.

ENVIRONMENT, PORTS AND THE INTRODUCTION OF MARINE EXOTIC SPECIES

The implementation of environmental management systems is seen as a common instrument to make environmental issues feasible in several enterprises, which corresponds to a set of procedures to manage or manage an organization, maintaining a good relationship with environmental issues (Maimon, 1996). Nilsson (1998) argues that environmental management planning, organization, guiding the company to achieve specific environmental goals, similar to what occurs with quality management, may even become an instrument for organizations to improve in their relationships with consumers, The general public, insurance companies, government agencies, among others.

Therefore, according to Andrade et al. (2000), this management process is continuous and adaptable, whereby an organization defines its objectives and goals related to the protection of the environment as well as health and safety of all involved in this context. During this process, there are several definitions and redefinitions of how the different social actors, through their practices, can alter the quality of the environment and how the costs and benefits of these agents will be distributed (Quintas, 2002).

In Brazil, Environmental Management in the port areas is fundamentally done through environmental licensing, since this is the main instrument in which the State controls the polluting economic activities (Anello, 2006). To this end, there is a need for compliance and compliance with national and international public policies. However, according to Lourenço and Asmus (2015), one of the major problems is that environmental licensing is still very incipient in the port context, since most of the ports are not properly regulated.

In addition to these environmental policies and regulations, according to Cunha (2006), the importance of the Port Environmental Agenda, established through the resolution of the Interministerial Commission for the Resources of the Sea, no. 09/1998, proposes guidelines For the adaptation of the port sector to the environmental parameters in force in the country. Koehler and Asmus (2010) state that the Agenda has the function of demonstrating the main issues arising from the implementation and operation of port activities, providing an institutional framework for environmental management in organized ports, based on the implementation of environmental coordination linked to the administration From the port.

It is possible to note that several agencies are responsible for guiding and supervising port activities within the context of environmental management. Within the context of the introduction of exotic species, the bodies that commonly play this role are: Brazilian Navy and/or National Agency of Waterway Transport - ANTAQ, National Agency of Sanitary Surveillance - ANVISA and the Local Port Administration. This division into several organs can cause operational problems in the day-to-day life of the port, as each one exercises the introduction of exotic marine species in a different way, impeding the effectiveness of the environmental management programs.

The ANTAQ and the Brazilian Navy follow the guidelines set forth in the International Marine Organization (IMO) standards, especially Resolutions MEPC.50 (31) (MEPC, 1991), with international guidelines for the prevention of the introduction of exotic species from Water used as ballast and the sediments contained therein; the A.774 (18) (IMO, 1993) on safety aspects of ballast water exchange at sea; And Resolution A.868 (20) (IMO, 1997), which deals with the control and management of ships' ballast water. In addition to having also implemented a set of standards, NORMAM-20 / DPC (Marinha do Brasil, 2014) establishes requirements regarding the prevention of pollution by vessels in Brazilian Jurisdictional Waters, in what concerns the Management of Ballast Water.

Normally, ANVISA follows its own standard, RDC No. 72/2009 (ANVISA, 2009), which also deals with the handling of ballast water, but aims at the introduction of harmful agents, pathogens and physical indicators and chemical components. The Local Port Administration, due to the obligation and requirement of the Operating License, usually follow many laws and decrees. According to Law No. 5,197 (Brazil, 1967), it provides for the protection of fauna, bringing in its article 4, the prohibition of the introduction of species in the Country, and related to articles 5 and 14, the importance of the Public Power regarding activities Related to environmental areas, referring mainly to environmental licensing.

The major problem lies in the diffuse actions between these organs, which makes the problem of the introduction of exotic species more common, since actions become more reactive than proactive. According to the Ministry of the Environment - MMA (2002), for environmental management processes to be effective, it is necessary to seek to reconcile a systematic, proactive and participatory procedure, resulting from the principles of environmental impact assessment, with the continuous nature And strategic decision-making processes to be applied.

THE INTEGRATED MANAGEMENT OF MARINE EXOTIC SPECIES: A PROPOSAL

In a way to try to solve the failures resulting from the evident bureaucratization of the system, which believes that sustainability will be achieved in the individual fulfillment of the functions of each organ and company, and due to the difficulty involved in executing environmental management in port areas, participatory management And integrated as a solution. According to Koehler and Asmus (2010), given the complex organizational structure of the ports and their activities, environmental management actions end up being punctual, necessitating integrative policies, based on technical instruments and whose implementation is made possible by institutional arrangements capable of operating the system Environmental management.

According to Cicco (2004), an Integrated Management System can be defined as the combination of processes, procedures and practices used in an organization to implement its management policies and that can be more efficient in achieving the goals from them than when There are several individual systems overlapping. The authors Andrade, Tachizawa and Carvalho (2000) still emphasize that strategic decisions integrated to environmental management can establish competitive advantages such as cost reduction and increased profits. According to Kitzmann and Asmus (2006), this integrated vision has become a common practice in many foreign institutions focused on port environmental management, such as the European Sea Ports Organization (ESPO), playing a major role in the search for Sustainability of port activities in the social, economic and environmental dimensions.

For the effectiveness of Integrated Management systems aimed at controlling the introduction of exotic marine species, it is necessary, according to Machado et al. (2009), the creation of a National Council for the Prevention and Control of Invasive Species to enable the implementation and revision of a national strategy through an integrated vision of the problem. This integrated council, formed with the following bodies: ANVISA, the Brazilian Navy, ANTAQ and the Port Administration; Can improve surveillance processes, stimulate research and thus strengthen current preventive measures.

It is interesting to note that countries such as Brazil, for example that have continental dimensions and usually receive ships from different regions of the world, need measures that integrate not the management and oversight bodies of the country, but also of other countries. According to Ziller, Zalba and Zenni (2007) it is very important and necessary the cooperation of other countries, because through this one can develop strategic capabilities for the common good, including other international regulatory organizations in the process, such as the Food and Agriculture Organization Of the United Nations - FAO, Convention on Biological Diversity - CDB and The Global Invasive Species Program - GISP, for example.

CONCLUSIONS

Based on the evidence presented and discussed above, it is important to draw up and consolidate a national strategy for the prevention and

control of exotic marine species in port regions.

It should be emphasized that this environmental management mechanism should be integrated to seek the synergy between the work of the organs, since they operate independently is not having the necessary effectiveness.

It is also necessary to go further, abandoning the defensive and reactive stance on port environmental issues, as far as bioinvasion is concerned, and it is necessary to anticipate the potential problems. Proactivity is one of the characteristics of environmental management and effective in an integrated context.

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