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Environmental licensing in Brazilian's crushed stone industries

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ABSTRACT

The crushed stone industries' activities are characterized by the extraction and processing of stones for use as aggregates in construction. The sector causes environmental impacts that can be mitigated by the implementation of control instruments, namely, environmental licensing, whose purpose is to carry out monitoring of potentially polluting activities. In this paper, it was analyzed the environmental studies of three industries located in Monsenhor Gil, Piauí, Brazil, elaborated as requisites for obtaining the environmental and mineral licenses. There were made visits to the State Department of Environment and Water Resources (SEMAR) and to the National Department of Mineral Production (DNPM) to verify the environmental reports and the environmental and mineral licensing processes. There were also made visits to the analyzed industries, with the aim of comparing the information contained in the studies, with the reality and verifying the implementation of the mitigating measures proposed in them, through the observation of the industries operation, and interviews with the responsible managers. Furthermore, it was made a research in the scientific literature, to know the licensing process in other countries, to compare with the Brazilian reality. From the research, in Brazilian industries, it was observed that, although all the legal steps to obtain the licenses have been fulfilled, the environmental reports have elaboration failures, such as the lack of a multidisciplinary team and the fact that some data diverge from the reality, decreasing the reliability of the evaluation of the environmental impacts caused by the projects. Also, the environmental replacement cost is not accounted in the final value of the product, and any of the industries have started the implementation of the proposed mitigation measures since they do not have mineral depletion areas. SEMAR was delayed in issuing licenses within the period established by law, and there are no periodic inspections by both the environmental agency and DNPM. It should also be pointed out that the community did not claim public hearings and there is no participation in environmental education projects, factors that compromise the effectiveness of the environmental licensing process. Regarding the process in other parts of the world, in some countries, such as Uruguay and Paraguay, the agency responsible for licensing and inspection is federal. In Argentina, as in Brazil and USA, states have autonomy to legislate on environmental issues. There is also divergence in the period of execution of the licenses, being 12 months in Brazil, while in Thailand it can be up to 56 days. In Peru, the society participation is much more representative than in Brazil, and there is differentiation in the collection form of environmental compensation fees, among countries. The failures pointed out in the Brazilian process, as well as the system of other countries, can serve as parameters for the improvement of the process' effectiveness, both in Brazil and in other parts of the world, aiming at the conservation of the environment.

1. Introduction

The crushed stone industries produce aggregates for the construction sector. Mineral exploration of crushed stone is an activity that generates the necessary inputs to improve the population's quality of life since the crushed stone is directly used in housing, sanitation, transportation, and infrastructure sectors (Valverde and Tsuchiya, 2009).

The crushed stone mining sector is characterized as being potentially polluting because it causes several environmental impacts, such as depletion of the natural resources, deforestation, modification, and destruction of native vegetation (Saha and Padhy, 2011; Tabatabaei and Mohammadi, 2013), noise pollution, air pollution, fauna scarcity, among others (Calaes et al., 2008). The Federal Constitution of Brazil requires that all industries, under these conditions, obtain an

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environmental license for the execution of their activities (Brasil, 1988a).

Environmental licensing is an instrument of the National Environmental Policy, established by Law 6.938, dated August 31, 1981. It is required for enterprises and activities with a potential risk of degradation to the environment (Brasil, 1981). It is an administrative procedure composed of three stages: Previous License (PL), Installation License (IL) and Operation License (OL). For the crushed stone mining activity, it is also necessary to obtain the mineral license, issued by the National Department of Mineral Production (DNPM) (Brasil, 1997).

The aim of the licensing is to promote measures for environment's control and conservation. Because it is a preventive instrument, it becomes a legal form of intervention by the State in actions of public or private interest that may cause environmental degradation (Rodrigues, 2010; Zhouri and Oliveira, 2012). Thus, environmental licensing becomes one of the leading instruments of environmental control, since it establishes preventive actions for the installation of new potentially polluting industries (Jay et al., 2007), seeking to mitigate impacts related to the environment and human health (Silveira and Araujo Neto, 2014).

However, the barriers faced to development of the environmental licensing political project are perceived by the limitation of the servers regarding the autonomy of action. Such autonomy can be constrained by structural aspects, such as work overload, budget constraints, and unnecessary bureaucratic rules (Santiago, 2016), which may compromise the effectiveness of the process.

According to Almeida et al. (2012), there are methodologies such as Environmental Impact Assessment (EIA) methods that assist in analyzing the effectiveness of Environmental Impact Studies (EIS) to evaluate the quality of the study and the information needed to the feasibility of the project. Thus, it is questioned whether these instruments of environmental control, environmental and mineral license, are useful in restraining the environmental damages caused by the crushed stone sector.

The goal of this paper was to analyze the environmental studies of three crushed stone industries located in the region of Monsenhor Gil, Piauí, Brazil, to confront the data with reality and verify compliance with the environmental mitigation and replacement measures proposed in the reports. It was identified failures in the studies preparation, which compromised the EIA and the effectiveness of environmental licensing. Furthermore, it was made a research in the scientific literature on the licensing process in other countries in order to know how the process works in other parts of the world.

It was verified that the Brazilian environmental agency, in Piauí state, does not comply with the procedure within the period established by law and does not carry out periodic inspections. In the same way, DNPM only performs inspections in case of denunciations. Also, it was verified that there was no request for public hearings and there is little monitoring of the industries activities, from the community, besides the lack of participation in the environmental education project, promoted by one of the companies.

2. Environmental licensing in other countries

The laws about environmental licensing processes around the world are similar regarding their aim, which is environmental conservation. However, there are differences in the way of application, concerning the agencies responsible for granting licenses, process execution time, among others. Therefore, it is essential to know how the licensing process happens in other countries to identify the points of convergence and divergence with the Brazilian and, thus, to adjust the improvements that can be applied to the reality of Brazil.

In 1969, the creation of the National Environmental Policy of Act (NEPA), in the United States, established the first EIA guidelines. The steps for reporting to obtain environmental licenses are similar across the world, being the screening, scope, report preparation, review and approval or rejection of projects, the main parts of a process of licensing (Bond et al., 2017).

Since the establishment of NEPA, EIA has been given legal and institutional strength in other parts of the world, so more than 100 countries practice it, including developing and transition economies. Although it has been adapted to different contexts and circumstances, its primary intentions and fundamental elements are analogous (Jay et al., 2007).

Table 1 describes the level of agencies (federal, state or county) responsible for environmental licensing in some countries, as well as the main characteristics of each process.

Table 1
Characteristics of environmental licensing in some countries.
Source: Authors.

Country	Licensing agency	General observations	Source
Brazil	Federal, state, or county	It is a complete process full of well-made laws, but there is lack of popular and governmental participation.	Gonçalves and Lira, 2012
USA	State	There is a government agency, called the United States Environmental Protection Agency (EPA), responsible for enforcing federal environmental protection laws. The US states have autonomy to grant environmental licenses. It is a solid and transparent process, which brings together government and popular participation.	EPA, 2017
Argentina	Province	Although various laws and regulations compose it, the procedure has flaws in many aspects, such as instrumentation, broadcasting, knowledge, application, and enforcement.	Rocha et al., 2005
Paraguay	*Ministerio de Obras Públicas y Comunicaciones*	Lack of government and popular participation	Oliveira and Espíndola, 2015, Ministerio de Minas y Energía, 2017
Uruguay	*Direccion Nacional do Medio Ambiente*	It is an embracing process that seeks for regional and international cooperation in environmental issues	Rocha et al., 2005Ministerio De Industria, Energía Y Minería-MIEM, 2017
Peru	Ministerial and sectoral departments	The licensing process usually involves conflicts and negotiations between mining companies, local communities, and government. The communities' involvement through public hearings is so significant that it has led to revision of projects, resulting in suspension or cancellation in some cases.	Jaskoski, 2014
Ecuador	Environmental Ministry	There are several problems associated with mining operations. Although that is not the only reason for the conflicts, mining is the most significant factor, since the population fears the possible social and environmental impact in the long run.	Vázquez et al., 2016
Denmark	Ministry of Environmental and Food of Denmark	Flexible process, high participation of community and government, mainly regarding governance mechanisms and contextual influences.	Lyhne et al., 2017
Germany	State, district, or county	Substantial roles for the competent authority and the public	Lyhne et al., 2017
United Kingdon	Ministerial departments	Less flexible process. The UK system is adapted to solve conflicts through a solid administrative culture	Lyhne et al., 2017