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SOCIAL AND ENVIRONMENTAL VULNERABILITY IN ENVIRONMENTAL EDUCATION PRACTICED WITHIN THE FEDERAL LICENSING IN MACAÉ (RIO DE JANEIRO, BRAZIL)

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Introduction

The concept of vulnerability emerges from studies on risks related to extreme weather events, constantly being associated with natural disasters (BLAIKIE et al., 1994; BENNETT et al., 2015).

To health and food security the term vulnerability is related to infection by bacteria, viruses, fungi, parasites (SCODRO, 2008; SOUZA, 2008) and various vectors such as malaria and leishmaniasis (PAHO, 2000; ALVES et al, 2002; MARTINI, 2012; MOURA, 2011).

In addition to infectious diseases, the vulnerability is present in reference to the catastrophic results caused by tsunamis (FIGUEIRA, 2005), nuclear accidents (DEMIDCHIK et al, 2007; MARQUES et al, 2012), earthquakes (NAGHII, 2005), changes in ecosystems (MACHADO, 2013) among others.

Similarly, the concept of social and environmental vulnerability is also polysemic, multidimensional and, besides being present in studies of various areas of knowledge, it can be analyzed and interpreted using different methodologies (LEMOS and HIGUCHI, 2011; CRUZ, 2011). The concept is being worked on several studies, such as risk mapping - used as a measure of resistance and resilience capacity of populations and territories (FREITAS and CUNHA, 2013) and mapping of land use and urban expansion areas (ALVES et al, 2010; ALVES, 2013).

Despite the variety of meanings and usages, this work seeks to contextualize the incorporation of the social and environmental vulnerability concept in the public policies of Environmental Education (EE) practiced in the federal environmental licensing of oil and gas in Macaé, a city with direct influences of oil economy since the late 1970s.

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The choice of deepen the concept of social and environmental vulnerability in the EE applied in the federal environmental licensing is the result of participant observation (DeWALT and DeWALT, 2011) conducted by the first author of this work during the period of 2012-2014, which were identified: i) questions regarding the method that supports the choice of the target audience by individuals presented in two Environmental Education Program (EEP) performed in Macaé (RJ) and, ii) no theoretical basis to target audience definition by the team performing the *EEP Observation*.

At the academic literature for EE in the environmental licensing of oil, the discussion of social and environmental vulnerability is presented mainly in the definition of "target audience" for the construction of the "educational action" (QUINTAS 2000; LOUREIRO, 2003; SOUZA; LOUREIRO, 2014).

The concept of social and environmental vulnerability is discussed in this study, from the theoretical framework of one of the authors of political ecology (LEFF, 2013), environmental conflicts (ACSELRAD, 2015) and critical EE (LOUREIRO, 2006).

The questions that guide this work are: 1) The terms "vulnerability" and "environmental vulnerability" are presented in the Brazilian environmental legislation focused on the EE? 2) What are the social groups defined by the economic agents, oil companies and consulting firms at the EPPs held in the city of Macaé (RJ), in 2013?

Methodologically, it was chosen to be done bibliographic research of texts in the Scientific Electronic Library Online - SciELO platform, in which were identified articles involving the following keywords: "vulnerability" and "social and environmental vulnerability," available until February 2015. To the expansion of the topics, under legal perspective, it was applied a survey about the legal framework relating to the EE in the federal environmental licensing in force until August 2014. Also, were analyzed public documents prepared by the Macaé City Hall, like the Town Planning Code of the city of Macaé - Complementary Law No. 141/2010 (MACAÉ, 2010), the Municipal Environmental Code - Law No. 027/2001 (MACAÉ, 2001) and the Local Housing Plan of Social Interest - PLHIS / 2010 (MACAÉ, 2010).

The text is organized into four sections, besides this introduction and conclusion. The first section presents a brief review of the literature on the concept of environmental vulnerability, while the second section shows an analysis on the Brazilian environmental legislation regarding EE on licensing. The third section presents the social groups defined by economic agents involved in the federal licensing process in Macaé, in 2013. And, the fourth section shows the neighborhoods in higher social and environmental vulnerability situation identified in the city of Macaé based on the PLHIS / 2010, an official document produced by the local government.

As a final consideration, the academic literature points to a broad spectrum of epistemological orientations when addressing the issue of environmental vulnerability. Only two documents of the EE legislation for environmental licensing presented the concept, they are: the IBAMA Technical Note 01/2010 and the Normative Instruction IBAMA 02/2012. Local data analysis from official documents produced by Macaé city hall and the specific scientific literature can illustrate the complexity of the central theme of the article, particularly in defining the social groups defined by economic agents for the educational action.

1. Characteristics of the national academic literature

For the literature review we used the method described by Galvan (2006, p. 31). Based on research conducted in the SciELO portal articles were found in 1101 as a result of search by the keyword "vulnerability" (accessed in February 13, 2015). The term first appeared in the discussion of the biological and social determinations of iron deficiency anemia disease (MARTINS et al., 1987). One can observe that there is greater concentration in the subject areas of Health Sciences (654) and Humanities (392). The three journals that presented the highest concentration of articles were the *Ciência e Saúde Coletiva* (80), *Cadernos de Saúde Pública* (63) and *Revista Saúde Pública* (48).

For the term "social and environmental vulnerability" it was found 26 articles, divided into six thematic areas identified in the SciELO search portal: Health Sciences (11), Applied Social Sciences (9), Human Sciences (8), Biological Sciences (2), Exact and Earth Sciences (1). The articles were divided into sub-areas as follows: Public, environmental and occupational health (10), Demography (4) Geography (3), Environmental studies (2), Multidisciplinary psychology (2) Urban studies (2), and others. The data shows this is a recent issue in national literature.

For presentation purposes in relation to the different uses of the concept, we present some work. The first publications with this term at SciELO portal appeared in 2006. Alves (2006) sought to "empirically operationalize the social and environmental vulnerability category" in order to "identify and characterize" the population of São Paulo in this situation (ALVES, 2006, p.43). In order to achieve this goal the author used as methodological purposes the overlap between social indexes and environmental indicators, identifying the poor population groups with high deprivation in areas of risk or environmental degradation (ALVES, 2006).

In the same year, Kran and Ferreira (2006) published a study to evaluate the city of Palmas (Tocantins), articulating economic, social and environmental. The authors sought to use the approach of "multiple dimensions" to increase the amount of variables analyzed. The study concludes claiming the need to review the discussion about the housing policies and urban management tools in order to make it more heterogeneous (KRAN and FERREIRA, 2006).

In the aim of analyzing the urban expansion and its relationship with the environmental vulnerability situations in the city of Tiradentes, São Paulo, Alves et al. (2010) used as methodology the "land use and urban expansion areas mapping" through the cross-checking of "satellite images, IBGE Census data, socioeconomic, demographic and environmental data" (ALVES et al., 2010, p.143). The authors observed the existence of overlaps between social and environmental vulnerabilities and the relations with the processes of urban expansion and the formation of working-class suburbs in the state of São Paulo.

Martins and Ferreira (2011) present a critical review on the theme of Brazilian cities and climate change, seeking to understand the processes of "urbanization and industrialization as a way to understand the condition and the origins of urban socio--environmental vulnerability" (MARTINS and FERREIRA, 2011, p.612). The authors

conclude pointing to the need for a greater involvement of studies on public administration and local management in the discussions about socio-environmental problems.

Based on participant observation and content analysis, Cruz (2011) and Lemos and Higuchi (2011), have studied the region called "Green Gold" ("Ouro Verde"), at the east zone of Manaus City. Cruz (2011) sought to understand the physical and social environment experienced by the child in a place with environmental degradation and spatial restriction to their social activities. On the other hand Lemos and Higuchi (2011) sought to describe the socio-environmental commitment adopted by residents living in vulnerable situations.

Zanella et al. (2013) studied the lower course of the water catchment area of Cocó river, in Fortaleza (CE) and developed integrated maps of geology, geomorphology, pedology, vegetation cover, urban use and infrastructure and, social and economic data. Salles et al. (2013) conducted a description of urban expansion and the environmental conflicts in the municipality of Mossoró (RN) based on secondary sources and municipal laws.

Using the mapping, Freitas and Cunha (2013) made use of quantitative analysis - with emphasis on statistical models and geographic information systems - to demonstrate how the concept of social and environmental vulnerability is linked to the issue of natural hazards or disaster. The authors argue the need to enter qualitative variables such as the perception of people and managers in relation to risks and vulnerabilities to natural disasters.

Alves (2013), seeking to empirically operationalize the concept, used the integration of three data for the construction of indicators: *i*) the results of the IBGE 2010 Census; *ii*) data representing areas of environmental risk and *iii*) the use of geoprocessing and spatial analysis of digital cartography for the city of Cubatão (SP). The results revealed the existence of «spatial concentration and overlap of poverty situations as well as socio-environmental risk exposure in certain areas» (ALVES, 2013, p.349).

It can be highlighted that the concept of vulnerability, which is currently in wide use in the social sciences, is originally from the human rights field (ESTEVES, 2011, p.74), migrating to the political geography and other areas, with a strongly correlation with the risk notions and risk society as discussed by Beck (1992).

Therefore, to Esteves (2011), social and environmental vulnerability is related to environmental risks, dependent on economic, technological and cultural factors (ESTEVES, 2011, p.75). Understanding that the poorest are the most vulnerable as well as those most at risk and exposed to hazards are also the most vulnerable.

After this brief overview of the use of the concept and seeking to promote an in-depth discussion on the use of the expression in the raised literature, three authors with extensive scientific recognition in different areas of knowledge were selected: *i)* Urban and Regional Planning (ACSELRAD, 2004; 2010); *ii*) Geography (MARANDOLA JR. and HOGAN, 2005; 2006), and *iii*) Environmental Education (LOUREIRO, 2003 SOUZA; LOUREIRO, 2014).

Acselrad (2004) understands the process of increasing inherent vulnerability in the issue of environmental conflicts. That is, whenever there is an environmental conflict there will be more vulnerable groups, with "different ways of appropriation, use and significance of the territory" (ACSELRAD, 2004, p.26).

Acselrad (2010, p.1) argued that the objective characterization of vulnerability comes up against two difficulties, "to consider vulnerability as a process and the vulnerable condition as a relationship" (ACSELRAD, 2010).

To Acselrad (2010), the increasing vulnerability process is associated with three factors: individual, political-institutional and social. Criticism on the use of the concept of vulnerability is associated with the fact of the observation locus is primarily focused on the individual and not on the process. For the author, the vulnerable condition is socially constructed and will always be defined from a point of view, condition generally enunciated by the State, or in the case of EE in the oil license for "companies wishing to stabilize their community relations" in a completely contradictory movement:

> "Thus, it may occur, a kind of "transferencial" rhetoric: it is alleged concern for the people in situation of "social risk" to undertake, in fact, protective actions of the company itself against the risk that the society seems to offer to your business" (ACSELRAD, 2006, p.4).

To Marandola Jr. and Hogan (2006) vulnerability is being used in various fields of knowledge in a fragmented way, making difficult the composition of a multiple perspective of the process. The authors advocate the idea that there is an effort in the field of Environmental Sociology aimed at promoting systematic reflections to address the social/cultural dimension in conjunction with the environmental dimension, thus seeking to compose a broad theoretical-methodological and also, ontological framework:

> "In these fields, it has been fundamental the understanding that the environmental stress experienced in contemporary society cannot be understood only in its technical dimension. The environmental question is recognized as one of the consequences of the dynamics and social structure as well as other stresses and issues related to the society" (MARANDOLA; HOGAN, 2006, p.36).

Marandola and Hogan (2009) point out that the vulnerability presents a relationship with space that allows microscale, reach the elements that interfere in the production, acceptance and mitigation of hazards (MARANDOLA and HOGAN, 2009).

Santos and Marandola (2012) recommend the use of quantitative and qualitative approaches as an "important methodological leap that studies on risk and vulnerability can move forward" the finding of areas and vulnerable individuals, through the discussion and understanding of the alternatives that social groups, in each place, have to respond to the dangers (SANTOS and MARANDOLA, 2012, p.106). In this line of thinking, the place is the center of the analysis and the studies aimed at identifying the situations and neighborhoods of the cities. In other words, the proposal aims to identify the "vulnerability of the place", starting from a concrete reality limited to a proximity scale, in the geographical dimension, defined as a "center of meaning and sociability" (MARANDOLA et al., 2014 p.111).

In the field of environmental education, the growing debate on the priority audience for educational activities. Quintas (2000) when addressing the "EE on environmental management," recommends as a priority of educational activities to work with the stakeholders in higher social and environmental vulnerability. Loureiro et al. (2008) has deepened the discussions about the social and environmental vulnerability concept arguing that:

> "By state of environmental vulnerability, we understand the situation of specific groups which are: (1) in a greater degree of direct dependence on natural resources to produce, work and improve the objective conditions of life; (2) excluded from access to socially produced public goods; and (3) absent from legitimate participation in decision-making processes with regard to the definition of public policies that affect the quality of the environment in which lives" (LOUREIRO et al, 2008, p. 18).

However, "environmental vulnerability" is a process (ACSELRAD, 2010) and can function as an analytical category (MARANDOLA and HOGAN, 2006), which seeks to incorporate into the study the inherent multidimensionality to the phenomenon, linking in the same context the extent of the risk, and the environmental, socioeconomic and political contexts.

On the other hand, the field of political ecology has theoretical schools that offer tools to analyze the dimension of environmental vulnerability. This is the case of Leff (2013), interested in the "study of the relations of power and political conflicts on the ecological distribution and social causes for the appropriation of nature', questioning thus forms of understanding of the "relationship between humanity and the nature, the history of exploration of the nature and cultures submission" (LEFF, 2013, p.15). In the dimension of political ecology the environment can be analyzed in association with politics, placing nature as a fundamental category to think about the organization of society (LOUREIRO, 2012, p.17).

Given this multiplicity of ways of understanding the concept in national academic literature and in order to focus the analysis around the EE in the oil licensing, we will trace in the next section, an overview of the legal framework relating to the implementation of the EE in the federal environmental licensing.

2. Vulnerable groups in the federal environmental licensing: The legal framework

Since the late 1990s, the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) from the concept of "environmental impact" acts in line with the National Environmental Policy and the National Environmental Education Policy proposing mitigation and compensation measures to the impacts associated with economic activities.

These include as an agenda for action for the oil companies, the production of educational / training environments to encourage qualified participation in the debate and

decision-making process (KAPLAN; LOUREIRO 2011, p.100). Layrargues and Lima (2014) identify three macro trends of EE in Brazil, they are: conservationist, pragmatic and critical.

To Serrão (2012, p.25) the principles of EE defended by the General Coordination of Oil and Gas (CGPEG) of IBAMA rely on the «emphasis on participation and the construction of political citizenship» in the environmental management process, based on a «critical, emancipatory, transformative» proposal (SERRÃO, 2012, p.214). In this regard, the author argues that the preparation of the Environmental Education Project (EEP) developed in the licensing should be primarily directed to vulnerable groups of the social and environmental point of view and related to the impacts observed in the projects.

The identification and analysis of the term vulnerability in the environmental legislation started by researching through the laws involved in the implementation process of public policies on Environmental Education and the licensing of maritime exploration and oil and gas production on the basis of scientific papers / theses that discuss the issue and present the legal framework (WALTER and ANELLO, 2012; SERRÃO, 2012).

After identifying the legal framework presented in the academic literature on the subject referred, the following documents were analyzed in order to identify the presence of the term environmental vulnerability: i) Chapter 225 of the Brazilian Constitution of 1988 (BRASIL, 1988); ii) National Environmental Policy - Law 6.938/1981 (BRASIL, 1981); iii) Law 9.966 / 2000 (BRASIL, 2000); iv) National Environmental Education Policy - Law 9.795 / 1999 and Decree 4.281 / 2002 (BRASIL, 1999; 2002); v) CONAMA 001/1986 (BRASIL, 1986); vi) CONAMA 23/1994 (BRASIL, 1994); vii) CONAMA 237/1997 (BRASIL, 1997); viii) CONAMA 350/2004 (BRASIL, 2004); ix) IBAMA Technical Note 01/2010 (BRASIL, 2010) on ex) IBAMA Normative Instruction 02/2012 (BRASIL, 2012).

Among the documents analyzed, only two have the term «vulnerability», the IBAMA Technical Note 01/2010 and the Normative Instruction IBAMA 02/2012. However, at IBAMA Technical Note 01/2010 the term has no definition and does not establish criteria for identifying these groups. The fact that the legislation does not specify the criteria and definitions enables open interpretations, which may be perceived as positive because each location has its specificities and complexities inherent in their political, social and economic context.

The TN IBAMA 01/2010 is constituted as a legal framework that establishes in a systematic manner the procedures for the preparation of programs by companies, which are required as a condition of license by the competent environmental agency.

On the other hand the IBAMA Normative Instruction 02/2012, that establishes the technical foundation for the development of the Environmental Education Programs (EEPs), orients towards the "organization of teaching-learning processes" whose objective refers to "the participation of social groups from areas of influence of the activities or projects." Regarding the subjects who will receive these programs, i.e. the receptors groups of the educational activities, the NI IBAMA 02/2012 guides that the most vulnerable groups should be primarily worked. However, again, it does not appear the definition of who they are and how to identify the vulnerable groups (IBAMA, 2012, art. 3, § 3).

In the next section we will identify the target audience defined by the oil and gas companies to the development of EEPs performed as compensatory measures in the environmental licensing in Macaé.

3. Vulnerable groups defined by economic agents in Macaé

Based on the analysis of EEPs performed in 2013 in the Campos Basin (RJ), this section aims to understand how economic agents put into practice in the light of the legal institutional framework, the concept of vulnerable groups. According to Serrão (2012, p.112), there are currently four foreign companies (Shell, Chevron, Statoil and BP) and two Brazilian (Petrobras and OGX) exploring oil and gas in the Campos Basin.

In the practice of EE in the oil licensing, both the definition of «target audience» for educational activities as methodological approaches are defined by the consulting firms hired by oil companies. As the proposal is submitted, IBAMA will seek to target them for priority work with groups in higher social and environmental vulnerability situation (NI IBAMA in 02/2012, art. 3).

By analyzing the EEPs it is possible to see the diversification of propositions, regarding the delimitation of the «target audience» and pedagogical strategies. Projects do not have connections between them and the criteria used for the definition and choice of subjects are quite distinct.

We note that between six projects (Table 1), three have as target the young public. Of these three, two projects are developed with young people, making up a heterogeneous group that emerges in training projects (Petrobras and BP). Only one project is directed to young people linked to fishing (Chevron). Two companies develop projects directly with fishermen, one with a gender approach, as with the shellfish collectors of São João da Barra and San Francisco (Statoil) and the other without a gender approach (OGX). Among the six companies studied, one chose to work with the quilombolas (Shell).

TABLE 1. Environmental Education Projects (EEPs) developed by companies within the oil licensing and the "target audience"

EEP Name	Company	Target
NEA BC	Petrobras	Young people and community leadership
Observação	DEVON/BP/HRT/Petrorio*	Young people (without specification)
REMA	Chevron	Young people involved with artisanal fisheries
FOCO	Statoil	Fishing community and Shellfish collectors of SJB and SFI**
Pescarte	Petrobras	Fishing community
Territórios do petróleo	Petrobras	Fishing community, peripheral urban residents, rural workers and settlers
Quipea	Shell	Quilombolas community

Source: http://www.pea-bc.ibp.org.br/. Accessed on 23 October 2015. * After purchasing the right to operate in a certain area, the purchasing companies are required to perform the actions of the previous companies, in this case, three companies were responsible for the same EE project. ** SJB - São João da Barra and SFI - San Francisco Itabapoana cities.

Based on participant observation, conducted by the first author in the cities of Macaé and Rio das Ostras (between 2012 and 2014), it is clear that the EEPs have common characteristics that hinder the implementation of the "educational process", among which deserves highlighted the lack of interest of young people in the city of Macaé in participating in this type of training. This perception has been endorsed by reports by members of the environmental consulting.

Based on the objectives of the EEPs ran in Macaé and difficulties in continuing EEPs in the city, we were able to consolidate its actions into three main categories:

i) Socialization of power. Production of spaces favorable to the "empowerment" of social groups for political participation. With this practice, it is expected that the individuals gain interest in politics and interfere in the city's daily life facing environmental changes caused by oil companies in collusion with the local government.

ii) Mobilization of the affected groups. Social mobilization to identify the "affected" groups. Companies seeking a mobilization of individuals who were characterized as "affected by the project," so that they begin to fight for a group that often do not feel they belong and / or have no interest in mobilizing for this kind of fight.

iii) Valuation of local culture. The aim is to value the groups considered "traditional" often trying to rescue certain way of life as if it were something concrete, objective and recognized by all. It is intended that the groups are organized to value what has been undervalued locally, without knowing what constitutes this depreciation. It is hoped the recognition and appreciation of traditional customs, exemplified in projects involving artisanal fisheries, as if this was not an activity in the process of decay, either by industrial fishing which "suffocates" the fish stocks or the low economic gains compared to the new economic arrangements, such as activities in the oil sector.

Apparently the objectives set by oil companies in Environmental Education Projects are not the objectives that local groups have chosen, creating distortions between theory and practice. To reduce this gap, new strategies are created, such as socio-environmental diagnosis, at which companies develop studies in the phase preceding the implementation of the EEP, and these studies generally carried out by multidisciplinary teams seeking to diagnose the situation of the municipalities relating them to the oil extraction activities.

Although concepts such as *participation, empowerment* and *critical formation* are present in the documents consulted, there is a great difficulty in mobilizing the actors to act in causes that are often not recognized by them, as reported above.

The analysis made by Magalhães and Machado (2013, p.10) find that "the action line A, characterized by the strengthening of community organizations to participate in environmental management is the focus in four out of the five analyzed projects." The diversity of vulnerable groups that the projects will cover from the quilombolas, to shellfish collectors, women linked to fishing activity, youth and educators of the region (Ibidem).

Regarding the municipalities in which the projects are developed, it is observed an apparent lack of clear criteria. Municipalities that suffer direct influence of oil activities, like Macaé, which is the basis of the national productive chain, received the implementation of three EEP, in a total of six. In comparison to Macaé the municipality of São Francisco Itabapoana, which also has indirect influence of this activity, was awarded five projects in 2013.

In the next section studies produced by the government of the city of Macaé were analyzed in order to identify in the official documents, the neighborhoods in process of environmental vulnerabilization and to confront the actions of economic agents in the practice of EE in environmental licensing.

4. Homes in risk areas in Macaé

As the "National Oil Capital", the city of Macaé (RJ) has become part of a strategic race with problematic consequences mainly involving the territorial issue (CORREA et al., 2011). Piquet (2012) points out that Petrobrás installation in Imbetiba caused rapid and radical changes in organizing the space, resulting in changes in population structure, employment, urban environment, within the political framework and local culture.

According to Binsztok (2012) the city of Macaé suffers from a concentration of 95% of the population in an area of approximately 20% of the city (BINSZTOK, 2012, p.288). With regard to infrastructure, the city faces problems such as lack of water, lack of sewage treatment and degradation of ecosystems (MOLISANI et al., 2013), lack of hospitals and schools. The result of historically inefficient governments, the problems faced in the city go beyond those generated by the oil economy.

In this scenario, the analysis of increasing vulnerability process in Macaé presents multiple dimensions, considering that any discussion of oil and natural gas may take different paths because it is part of a complex political, economic, energy, social and environmental scenario (MACHADO; VILANI, 2010, p.151).

Based on the «Social Housing Site Plan (PLHIS), Diagnosis of Housing Needs», which is a document prepared by the Macaé government in 2010, it was possible to identify the poor neighborhoods and the housing needs of the city. Most human settlement is located in the neighborhoods of Malvinas and Lagomar, which have 7,646 and 9,836 homes in extremely precarious conditions according to the above-mentioned study.

The residences in risk areas are heterogeneously distributed by the city with situations, problems and peculiarities quite different for each location. After the analysis of PLHIS, it was possible to identify the following issues: i) the presence of pipeline; ii) transmission line; iii) railroad; iv) slips; v) floods and vi) contaminated site as it is located on top of a former dumpsite (MACAÉ, 2010; LEAL and COSTA, 2012; COSTA et al., 2013).

The total number of households in poor condition and at risk and / or environmental conflict can be seen in Table 1. The figures point to a degree of complexity in the definition of groups in vulnerable situations in Macaé, because the risks are diverse and ever inherent in the daily life of many families.

TABLE 2.Households in Permanent Preservation Area (PPA) and at risk for poor settlement

Settlement Neighborhoods	PPA	Risk situation				
		Range Not Buildable		Sliding Slopes	Flood by storm tide	Contaminated area Deactivated dumpsite
Lagomar	124	-	-	-	-	-
Fronteira	-	-	-	-	274	-
Nova Holanda	207	-	-	-	-	-
Barra de Macaé	316	-	-	-	-	-
Malvinas	612	-	52	-	-	-
Complexo da Ajuda	16	85	-	20	-	-
Piracema	44*	-	22	-	-	-
Nova Esperança	74	-	-	-	-	-
Morro de Santana	-	-	-	209	-	-
Novo Botafogo	274*	-	16	-	-	-
Novo Horizonte	-	-	-	163	-	-
Águas Maravilhosas	-	-	-	-	-	147
Ilha Leocádia	648	-	-	-	-	-
TOTAL	2.315	85	90	392	274	147

Source: Adapted from the Social Housing Plan (Plano Habitacional de Interesse Social) of Macaé (2010). PPA: Permanent Preservation Area. * PPA and RNP overlap.

Among the neighborhoods in the city of Macaé three situations are emblematic: 1) Lagomar, to be located in the buffer zone of the Restinga de Jurubatiba National Park, with households a few meters of the pipeline that takes gas from the Campos Basin to the Cabiúnas Terminal (Tecab); 2) Águas Maravilhosas to be located on the former dumpsite of the city with high environmental risks and 3) Malvinas and Nova Holanda, with great concentration of residences in precarious situations near the estuary of Macaé river, highly degraded environment (MOLISANI et al., 2013) and with high levels of poverty and violence (WAISELFISZ, 2013).

Finally, after analyzing this document is expected to contribute so that the residents of the aforesaid communities are recognized as subjects for priority actions related to local public policies and Environmental Education Programs (EEP) within the oil and gas licensing.

Final considerations

By the end of this article, it was possible to see that there is no consensus on the concept of social and environmental vulnerability in the academic literature, since the analysis criteria are varied, being guided by a broad spectrum of epistemological assumptions and methodologies that derive from different conceptions. The definitions in general, aim to relate in the same context the environmental dimensions (eg contamination of ecosystems, pollution or housing construction in risk area), with the social dimensions (eg rates of violence, poverty, among others).

It is necessary to discuss the fact that the identification of vulnerable groups suggests the existence of a dimension of individuals, giving a reductionist character to the discussion, since there is a complex process in which individuals seem to enter in vulnerability ranges, with groups more or less exposed to the risks and social and environmental problems.

In this perspective, we agree with Acselrad (2010), which recommends that the claim of measuring the number of individuals considered socially vulnerable should be accompanied by an effort of contextualization and, to be associated with the characterization of the relative vulnerabilization processes for the purposes of its subsequent interruption (ACSELRAD, 2010, p.5).

The "development" seems to still follow a model seated in the culture of squandering of natural capital, with high levels of degradation and a large collection of problems, so it is always relative (MACHADO, 2012, p.13). The insertion of the "sustainable" term (MACHADO, 2012 p.15-16), based on the principles of: 1) social justice; 2) economic viability; 3) ethics in the political sphere; 4) cultural diversity; 5) environmental quality and 6) inclusion in decision-making processes, does not match the current model adopted in the city of Macaé.

Last of all, it is also worth emphasizing, the presence of theoretical and methodological ambiguities practiced by consulting firms operating in promoting quality education as environmental, to which must be rethought. Moreover, it was observed that the criteria for classification of the actors in the vulnerable group condition, both by oil companies and by IBAMA, are not clearly marked, since there are numerous approaches to the analysis of the vulnerability of the process.

It is recommended, therefore, that IBAMA is positioned on this issue, since the absence of clear standards defined by the institution allows the ownership by the "target audience" companies that suits them "instrumentalize" the EE tool, either by marketing promotions or associations with social responsibility actions.

We believe that institutionalized spaces for "teaching practices in licensing" works as a stage for the understanding of the way the government operates and the way companies and local agents do assert their interests on a diffuse property (the environment) and on the well being of communities.

Environmental education in the oil licensing appears to be a proposal to create spaces that encourages the exchange of knowledge because it allows different social actors who would hardly have the opportunity to establish a dialogue, to come together and express their points of view, favoring social control of environmental degradation.

However, as a recent educational practice and a field in dispute (LAYRARGUES and LIMA, 2014), it is believed that is needed a greater research investment to understand the limits and possibilities of construction of these scenarios, providing opportunities to approaches and dialogues between different actors.

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SOCIAL AND ENVIRONMENTAL VULNERABILITY IN ENVIRONMENTAL EDUCATION PRACTICED WITHIN THE FEDERAL LICENSING IN MACAÉ (RIO DE JANEIRO, BRAZIL)

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Abstract: Given the growth the oil industry faced in contemporary Brazil and, since the Environmental Education is a compensatory measure in the federal environmental licensing, the aims of the present article are: i) mapping the publications on "environmental vulnerability"; ii) checking on the incorporation of such concept into the institutional and legal environmental education (EE) framework in oil licensing iii) understanding how the mentioned concept is used by economic agents in Macaé city. The methodology consisted of a participant observation approach used during the implementation of an EA program in Macae between 2012 and 2014, as well as of literature review, data collection in the legislation on EA in oil licensing and in technical documents produced by economic agents. Despite the advancement of academic discussions about the "environmental vulnerability" concept, we see the absence of clear criteria to define the social groups in vulnerability situations in educational activities concerning the environmental licensing.

Keywords: Public policy, environmental licensing, impacts, Campos Basin, Brazil.

Resumo: Considerando o crescimento do setor petrolífero no Brasil contemporâneo e a Educação Ambiental como medida compensatória no licenciamento ambiental federal, os objetivos deste trabalho são: i) realizar um mapeamento das publicações sobre o tema "vulnerabilidade socioambiental"; ii) verificar se há incorporação de tal conceito no arcabouço institucional-legal da Educação Ambiental (EA) no licenciamento de petróleo; e iii) compreender como o mencionado conceito é usado pelos agentes econômicos atuantes no município de Macaé. A metodologia do estudo consistiu em observação participante durante o processo de implementação de um Programa de EA em Macaé entre 2012 e 2014, revisão da literatura, coleta de dados na legislação referente à EA no licenciamento de petróleo e em documentos técnicos produzidos pelos agentes econômicos. Apesar do avanço da discussão acadêmica a respeito do conceito de "vulnerabilidade socioambiental",

observa-se uma ausência de critérios claros para a definição dos grupos sociais em situação de vulnerabilidade quanto às ações educativas no licenciamento ambiental.

Palavras-chave: Políticas públicas, licenciamento ambiental, impactos, Bacia de Campos, Brasil.

Resumen: Teniendo en cuenta el crecimiento de la industria del petróleo en Brasil contemporáneo, y que la Educación Ambiental es una medida compensatoria en el proceso de licenciamiento ambiental federal, los objetivos de este trabajo son: i) verificar las publicaciones sobre "vulnerabilidad socioambiental"; ii) verificar si la incorporación del concepto en el marco institucional y legal de la educación ambiental (EA) en el aceite y la concesión de licencias iii) entender cómo el concepto es utilizado por los agentes económicos en la ciudad de Macaé. La metodología del estudio consistió en la observación participante durante el proceso de implantación de un programa de EA en Macaé, entre 2012 y 2014, revisión de la literatura, recopilación de datos en la legislación sobre la EA en el proceso de concesión de licencias de petróleo y documentos técnicos elaborados por los agentes económicos. El trabajo destacó que a pesar del avance de la discusión académica sobre el concepto de "vulnerabilidad socioambiental", vemos todavía, una ausencia de criterios claros para definir los grupos sociales vulnerables en las actividades educativas en el proceso de concesión de la licencia ambiental.

***Palabra clave*:** Políticas Públicas, licencias ambientales, impactos, Bacia de Campos, Brasil.