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Strategic Environmental Assessment And Environmental Accounting Audit As Instruments To Optimize The Environmental Public Policy In Brazil

Abstract

The environmental policy is a set of guidelines, objectives and action instruments the public power uses to produce desirable effects in the environment. Some of these instruments have not been institutionalized yet, such as Strategic Environmental Assessment (SEA), which is aimed at developing a macro-study of the impacts caused in the environment and the community; and the Environmental Accounting Audit (EAA), which consists in confronting the information from environmental and financial statements. Hence, the following questions emerge: a) what problems are caused by the absence of SEA and EAA from the Brazilian environmental policy? b) how would the inclusion of SEA and EAA contribute to solve the specific problems detected? The objective in this article is to demonstrate that there is a gap in the environmental policy because these instruments are ignored. The theoretical framework was constructed based on environmental accounting, environmental audit and public policy. The method used was descriptive analysis with regard to its objectives. A bibliographic and exploratory study was undertaken about the themes: public policies, SEA and EAA. In conclusion, SEA and EAA need to be institutionalized in the initial and final phase, respectively, of the establishment and monitoring process of enterprises that impact the environment, because the fact that they are not compulsory revealed a gap in the environmental policy, which weakens it.

Key words: environmental policy; environmental statements; financial statements.

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1. Introduction

The Brazilian National Environmental Policy, through Law 6.938 (1981), defines the compulsoriness of environmental licensing, which requires the Preliminary Environmental Impact Study (EIS) and the Environmental Impact Report (EIR) for the establishment of potentially polluting companies or which can cause the depletion of natural resources. The company that proposes the project is financially responsible for these studies and should hire and skilled multidisciplinary team to perform the services, which is technically responsible for the results presented. After the elaboration of the EIS and EIR, the project proponent needs to present them to the competent environmental entity which, based on the studies, will grant the preliminary license for the establishment of the enterprise or not. The company is obliged to respect the dimension of the impacts that will be produced and the actions needed to mitigate these impacts, as mentioned in the EIS and EIR, which will be supervised by the municipal, state or federal environmental entity. Thus, the EIS and EIR are documents that guide the effective control and supervision of the company's future activities.

This reveals a gap with regard to the environmental issues during the phase preceding the formulation of the establishment project of the enterprise, that is, in the planning phase, when the decisions about its establishment are made in the strategic governmental sphere, often without considering the environmental impacts in a broader regional context, determined by the Strategic Environmental Assessment (SEA). As the Environmental Impact Assessment (EIA), corresponding to the EIS and EIR, only happens after the decision about the establishment of the enterprise has been made at the strategic government level, it is considered reactive, and works with limited time and opportunities for modifications.

Professionals from different activity areas are responsible for the control and supervision process of the works and the companies' future activities, under the responsibility of the public environmental entities. When the enterprise has been certified, or the environmental audits are compulsory, like in some Brazilian states, besides the abovementioned control by public entities, the company goes through internal and external environmental audits.

The gaps presented here in terms of the planning and monitoring period permit the emergence of specific problems that could be solved through two important instruments that have not been institutionalized yet: the SEA and the EAA.

Departing from this premise, in this research, we intend to answer the following questions:

a) What specific problems are created by the absence of Strategic Environmental Assessment and Environmental Accounting Audit from the Brazilian environmental policy, concerning the establishment of potentially polluting companies or which can cause the depletion of natural resources?
b) How does the inclusion of the Strategic Environmental Assessment and Environmental Accounting Audit contribute to solve the specific problems detected, furthering the effectiveness of the Environmental Public Policy in Brazil?

According to Frey (2000), traditional studies on public policies, based on quantitative methods, are frequently forced to limit the number of explanatory variables due to technical and organizational difficulties. If we want to know further details about the genesis and trajectory of certain public programs, however, the favorable factors and bottlenecks, then the comparative research nevertheless has to concentrate more intensely on the investigation of the political-administrative processes' internal life. With this process-based orientation, according to the author, the institutional arrangements, attitudes and objectives of the political actors, the action instruments and the political strategies become more important. Therefore, this study is concentrated on the action instruments of the Brazilian environmental public policy.

The study is justified because it contributes to the discussion about improvements in the action instruments of the environmental public policy, with a view to gaining effectiveness in the achievement of its intended objectives.

Therefore, the article is divided in topics: the first presents the introduction, the second the objectives, the third the literature review about the themes public policies, strategic environmental assessment and environmental accounting audit, the fourth the method used to develop the theme, the fifth the results and discussion deriving from the studies, and the sixth the final considerations.

With a view to answers the proposed problems, the objective in this article is to demonstrate that there are gaps in the Brazilian environmental public policy due to the ignoring of the SEA and EAA, mechanisms that complement and harmonize this policy, which can permit the effective achievement of its targets.

2. Literature Review

2.1. Public Policies

According to Bucci (2002), public policies are typical activities of the social State of right and are related to the strategies the government uses to solve social problems. These strategies, in line with Boneti (2006), derive from the existence of the relation between the State and the social classes, for which the intervention measures that consider only administrative actions are considered public policies.

In accordance with Vieira and Bredariol (1988, p. 77), public policies cannot be considered as isolated actions by a given entity, but as a complex system that, to achieve its objectives, needs to count on different organisms' actions, as follows:

> The first idea of a public policy is a set of actions by state entities with a view to equalizing or solving problems of the group. When we analyze any public policy, we perceive that, besides the State, social and political actors participate in its formulation or execution.

In the field of political science, Mota (2001, p. 68) considers public policy as:

> [...] a relatively new area, whose development as a field of study started with the acknowledgement that traditional analyses of government decisions were incomplete and presented serious risks for the wellbeing of society.

Among other bottlenecks for the correct formulation and analysis of public policies, there is the lack of policy networks, that is, a lack of interaction among the different institutions and groups (executive, legislative, society) in their genesis, implantation and analysis, according to Frey (2000). Ashford and Hall (2011), for example, consider that the opening of the political and participatory space, permitting new voices to contribute to integrated solutions and thoughts, is fundamental for the establishment of co-optimizing or mutually reinforcing social policies.

As regards the environmental policies, the National Environmental Policy Act [NEPA]), which the American Congress approved in late 1969 (US Environmental Protection Agency, 2013), is considered the first legal document to broadly establish the links between the decision process and concern with maintaining the environmental quality. Today, the NEPA is mainly known because of the administrative arrangements created during its implementation process, especially the Environmental Impact Report [EIR] and the process associated with this declaration, the EIA, which is a process that can be defined as a set of procedures aimed at guaranteeing that environmental as well as social factors be appropriately considered in the decision process among the establishment of potentially polluting enterprises or that cause the depletion of natural resources (Egler, 2001).

The formulation of an environmental public policy results in the significant transformation of the institutional arrangements at all public action levels and the emergence of new political actors, such as environmental associations, research institutions and public agencies in charge of preservation (Frey, 2000).

In Brazil, based on Principle 21 of the Stockholm Declaration (Conferência das Nações Unidas sobre o Meio Ambiente, 1972), according to which "States have the sovereign right to explore their own resources pursuant to their own environmental policies", the lines of the environmental policy were outlined, culminating in the enactment of Law 6.938 (1981) on August 31st 1981, which established the National Environmental Policy, setting concepts, principles, penalties, goals, formulation and application mechanisms, as well as the National Environmental System [Sisnama] and the National Council of the Environment [Conama] (Ministério Público Federal, 2004).

The environmental public policy, as the set of guidelines, objectives and action instruments the public power uses to produce desirable effects in the environment (Barbieri, 2006), has a strongly conflicting characteristic, as it means the regulation of economic activities where, according to Frey (2000), the political disputes and power relations will always mark the programs and projects developed.

In Brazil, according to art. 9 of Law 6.938 (1981), the instruments of the National Environmental Policy include, among others, the EIA, whose end products are the EIS and EIR, the licensing and the review of actually or potentially polluting activities, the incentives towards the production and installation of equipment and the creation or absorption of technology, aimed at improving the environmental quality, the creation of territorial spaces under the particular protection of the federal, state and municipal Public Power, such as environmental protection areas, of relevant ecological interest and extractivist reserves and the disciplinary or compensatory penalties for non-compliance with the measures needed for preservation or the correction of environmental degradation.

Among other objectives, this set of instruments is aimed at inducing or forcing the economic agents to adopt postures and procedures that are less aggressive to the environment, with a view to reducing the amount of pollutants launched into the environment and minimizing the depletion of natural resources (Carvalho, Barcellos, & Moreira, 2009).

Therefore, the impact assessment instruments are inherent and undeniably political (Richardson, 2005; Elling, 2009; O' Faircheallaigh, 2009; Turnpenny, Lorenzoni, & Jones, 2009) as: a) they are based on the theoretical premise that they cause changes in the values that sustain the establishment and execution of a project, policy, plan or program; b) set limits as to how they will be molded, analyzed and debated on, standardizing procedures, and c) refer to the distributional justice [resource allocation within and between generations, satisfaction of needs, among others] (Cashmore, Richardson, Hilding-Ryedvik & Emmelin, 2010).

Like any policy, justifications, theoretical foundations, targets and instruments accompany the environmental policy, besides determining penalties for those who do not comply with the established standards. This study is concentrated on the action instruments of the Brazilian environmental public policy.

2.2. Strategic Environmental Assessment (SEA) as an action instrument of the Environmental Public Policy

The Strategic Environmental Assessment is an assessment process of the environmental impacts of development policies, plans or programs [PPPs], established in a given wider context [national, regional, local or sectorial], in the initial stage of the decision process, together with economic and social considerations (Sadler & Verheem, 1996). This instrument systematically analyzes the area that is to be influenced, suggests possible technological alternatives, indicates the cumulative impacts and indirect externalities, identifies sustainable [or unsustainable] locations for the implementation of enterprises and assesses alternative PPPs (Thérivel & Partidário, 1996).

According to the Portuguese Environmental Agency (APA, 2011), the SEA of development plans and programs is an impact assessment instrument at the strategic level, aimed at incorporating a series of environmental values into the decision procedure, **during** their elaboration and **before** their approval. It guarantees a strategic view and a broad perspective on the environmental issues through the global integration of the biophysical, social and political dimensions, relevant for the sake of sustainability.

Although some of the concepts associated with SEA have been known for almost 40 years, according to Fernandes and Parada (2009), the application of the SEA as an integration and assessment tool of the environmental and social conditioners in the phase before the decision process is still hardly significant in Europe and in the development plans of the energy transportation networks.

Sánchez (2008) disclose the relevance of the SEA as a planning tool to the extent that it identifies adverse socio-environmental impacts of PPP's, whether these are macro-economic or sectorial policies, like transportation and energy policies, their cumulative and indirect impacts. Then, it assesses and proposes alternatives to improve the strategic action (João, 2005). As it covers a broader context [national, regional, local or sectorial], this process can facilitate the development and implantation of coordination procedures, with a view to avoiding inconsistencies and conflicts between the objectives, targets and actors participating in these PPP's, integrating the policies.

One of the first Brazilian entities to suggest the inclusion of the SEA as an environmental public policy instrument was the Ministry of the Environment (ME), which proposed that this instrument be turned compulsory, enforced through environmental legislation and the Federal Court of Auditors (TCU). It should be highlighted that the TCU had already pronounced itself on the theme in the agreement 464/2004, which recommends the adoption of the SEA in the elaboration of the Multiannual Plan and the planning of sectorial policies, plans and programs, as a result of the provocation by the ME, resulting in operational audits and the analysis of the applicability of the SEA by the federal government.

The SEA is generally related to governmental initiatives, although it is also applied to private organizations' enterprises. Sánchez (2008) highlights some enterprises in Brazil that applied SEA to analyze its impacts, that is: exploitation of oil and gas on the South coast of Bahia; implantation of an iron-steel hub at the margins of the Pantanal; plan for the use of the remaining hydro-electric potential in Minas Gerais; construction of a metropolitan ring around São Paulo; and construction of the Industrial Port Complex of Pecém [CIPP] in Ceará.

According to Egler (2001), the use of SEA reinforces Economic Ecological Zoning [EEZ] as a strategic instrument for regional planning and territorial management, established in the National Environmental Policy (Law 6.938/81).

2.3. Environmental Accounting Audit

For enterprises that impact the environment to get established, the environmental legislation and licensing entities to set limits for the level of degradation to be committed, which are related to nature's resiliency, to mitigating measures, to the occupation rates designed for the location, among other criteria. These measures are aimed at preventing damage to the national equity.

Hence, to understand the definition of national equity, it is valid to highlight the determination in the **caput** of Federal Constitution art. 225 (1988): "All citizens are entitled to an ecologically balanced environment, a good for the common use of the people and essential for a healthy quality of life, imposing the duty to defend and preserve it for the present and future generations on the Public Power and on the group."

The National Environmental Policy Law, Law 6.938 (1981), expresses in paragraph I of art. 3 the environment concept: "the set of physical, chemical and biological conditions, laws, influences and interactions, which permits, shelters and rules life in all of its forms". In accordance with the same legal document, it is verified in paragraph I of art. 2 that the legislator considers the environment as "a **public equity** that needs to be guaranteed and protected, in view of its collective use" [our highlights].

In the same search for the concept of national equity, the determinations in § 4 of Federal Constitution art. 225 is highlighted (Brasil, 1988): "§ 4 the Brazilian Amazon Forest, the Atlantic Forest, the Serra do Mar, the Pantanal of Mato Grosso and the Coastal Zone are **national equity**, and its use will take place in the form of the law, in accordance with conditions that guarantee the preservation of the environment, including the use of the natural resources" [our highlights].

Thus, if the organizations comply with the limits and authorizations established in the environmental licenses, they will also be safeguarding their private equities against possible fines, indemnities, interdictions, among other punishments.

Santos, Schmidt, Gomes & Fernandes (2003, p. 65) define equity as "the set of material and non-material goods, rights and obligations that can be valued in money and linked with the entity through property, ownership or control, which the entity has at its disposable in the development of its business."

According to Tinoco and Robles (2006) and M. V. Silva (2008), precise information on companies' environmental management prevent and correct damages, and also safeguard the corporate and national equities. The compliance with the limits established by the environmental standards or entities is verified through environmental audits.

In line with the Committee on Basic Auditing Concepts – American Accounting Association (1973), auditing is:

> [...] a systematic process of objectively obtaining and assessing evidences, considering information about economic actions and events in order to verify the degree of correspondence between that information and established criteria and communicate the results to the interested users.

Antunes (1998, p.205) highlights that, at bottom, auditing consists of three phases:

1) comparison between two or more elements;
2) exercise of judgment, taking one of the compared elements as the reference standard; and;
3) expression of an opinion about the compliance of one element with the other (that adopted for the sake of reference).

Environmental audit is the systematic procedure through which an organization assesses all of its practices and operations that offer potential risks to the environment and to public health, so as to verify its appropriateness for pre-established criteria in legal standards or policies of the company or the sector it is active in (Sales, 2001).

According to Fiorillo (2002), the environmental audit is defined as the management instrument that includes the systematic, documented, periodical and objective assessment of the functioning of the organization, the management system and the environmental protection processes.

The Standard ISO 14.010 (Associação Brasileira de Normas Técnicas [ABNT], 1996) defines environmental audit as:

> [...] the systematic and documented verification procedure, executed to obtain and evaluate, objectively, audit evidences to determine whether the specified activities, events, management system and environmental conditions or related information are in compliance with the audit criteria, and to communicate the results of this process to the client.

Mateo (1997) highlights that the compulsoriness of audits derives from the fact that companies hardly tend to spontaneously disclose their situation if it reveals negative data and that the environmental risks many companies expose the society to are significant and should not be left to the companies' free will.

According to Marion (2005), while practically all companies are audited in developed countries, Brazil lacks auditors and audits, perhaps being the least audited country in the world. In the Netherlands, there is one independent auditor for every 900 inhabitants; in Great Britain, one for every 1,300 inhabitants; in the United States one for every 2,300. In Brazil, there is one independent auditor for every 25,000 inhabitants and only 3,000 companies, out of 4.5 million existing ones, constituted in the form of publicly traded corporations, traded on stock exchanges, are subject to compulsory accounting audits.

Although not enforced by law, certain companies disclose environmental information voluntarily, with a view to attracting socially responsible investors. In other words, the companies practice environmental actions and then disseminate this information to the market with a view to gaining benefits. Nevertheless, the lack of a standardized model hampers comparisons among companies.

Costa and Marion (2007) examined the environmental information published on the company websites and on the site of the São Paulo Stock Exchange [Bovespa] and found that the lack of uniformity hampers the information analysis. In that sense, Murcia, Rover, Lima, Rover, Lima, Fávaro, & Lima (2008) revealed that, besides the lack of standardization, when disclosed, environmental information tends to be published declaratively, without any quantification. Therefore, Carvalho (2008) and Pereira (2007) highlight the relevance of environmental audits in combination with financial audits, as the companies' problems generally influence their accounts.

In that sense, it is emphasized that Bill 1.254/03 has already been discussed in the Chamber of Deputies, aimed at changing the National Environmental Policy, Law 6.938 (1981), in order to determine periodical environmental audits in companies or entities, whether public or private, responsible for works or activities that potentially cause environmental degradation or use environmental resources in their production process. According to that Bill, the companies also need to account for their environmental liabilities and assets.

Thus, the relevance of that Bill is acknowledged, proposing environmental audits as instruments of the National Environmental Policy, so that the companies and entities would truly comply with their environmental policy responsibilities. Consequently, the audits would qualify and quantify the environmental liabilities of legal entities, which would compulsorily be included in the financial control systems. Hence, environmental liability information would be available not only to partners and stockholders, but to society as a whole. Nevertheless, Bill 1.254 (2003) did not take off and is currently 'shelved' due to strong pressure from political groups, in and outside the Chamber of Deputies.

It is highlighted that, with regard to the compulsory nature of environmental audit, Conama Resolution 265 (2000) obliges the oil sector and other companies active in the oil and derivatives area to perform environmental audit due to severe accidents that have happened in the past in the practice of these activities. It is also highlighted that, in some Brazilian states, laws have been created to make environmental audits compulsory for some industrial sectors, including: Rio de Janeiro, in 1991; Minas Gerais, in 1992; Espírito Santo, in 1993; Mato Grosso, in 1995; São Paulo, in 1997; Paraná, in 2002. Finally, some cities have also created laws for compulsory environmental audits, such as: Santos (SP), in 1991; São Sebastião (SP) and Vitória (ES), in 1993; Maceió (AL), in 1996; and Bauru (SP) in 1999.

Balance sheet publications containing environmental information started in the 1990's, upon the revolutionary initiative of a Dutch company. Therefore, that company developed a method to quantify the environmental impact its activities provoked, as a result of the gases produced by the cars its employees used, the consumption of electricity, natural gas for central heating and the use of air-conditioning in its offices, besides identifying the environmental costs related to the collection, incineration and pollution of the paper used and the waste treatment costs (Ribeiro & Martins, 1993). In the same period, Gray (1992) publishes his paper about accounting and environmentalism, discussing the potential of accounting techniques to clarify what is called 'sustainability'. One year later, Gray, Bebbington, & Walters (1993) publish the book *Accounting for the Environment*, considered the Bible of Environmental Accounting until today. Some years later, ISAR/UNCTAD (1998) publishes *Environmental Financial Accounting and Reporting at The Corporate Level*, presenting concepts like environmental liabilities, environmental contingencies, environmental costs among others in detail, as well as the suggested contents for the annual reports.

In parallel, in Brazil, Ribeiro and Martins (1993) considered that the different obstacles raised to measure environmental spending, as the triggering event occurs, could be overcome through the countless statistical and mathematical techniques Accounting has at its disposal, through risk studies or even based on earlier experiences. Other authors discussed the relation between accounting and environment in the same period (Tinoco, 1994; Martins and De Luca, 1994; Ferreira, 1996; Bergamini Jr., 1999). Later, Kraemer (2001) presented environmental applications and accounting procedures, discussing expenses, costs, environmental assets and liabilities and explanatory notes, among others, in the attempt to guide the environmental accounting procedures. Since then, several books have been published on the theme in the country (Silva, 2003; Ferreira, 2003; Paiva, 2003; Tinoco e Kraemer, 2004; Ribeiro, 2005; Braga, 2007; Carvalho, 2008; B. G. Silva, 2008), defining the spending that can be recognized as environmental and identifying the most significant environmental impacts, offering methods for the accounting monitoring of companies' environmental management system, entry models related to environmental accounting facts and software like the Environmental Accounting Information System [SICA], among other information.

Hence, the environmental accounting audit is a technique to verify this information provided by environmental accounting, which represents a necessary instrument to complement the environmental policy, with a view to comparing the information in the environmental and financial reports, judging the compliance of this information. This mechanism permits assessing whether the list of negative environmental impacts and mitigating measures, indicated in the environmental reports, was actually put in practice, registered and disclosed in the financial statements, as all economic, social or environmental events, provided that they cause changes in the organizations' equity, should be present in these reports.

According to Carvalho (2008), the disclosure of environmental information with accounting reflexes, that is, the information that alters organizations' equity, should be operated in specific accounts with labels to identify their goals. Thus, the information needed to confront the accounting records and the data in the environmental reports [SEA, EIS or EIR], to be accomplished through the environmental accounting audit, tends to be more evident.

3. Method

The research objectives are classified as descriptive, considering that it is restricted to the analysis of existing information, according to Beuren, Boff, & Horn (2003). Concerning the procedures, a bibliographic and exploratory research was undertaken, consulting existing literature sources about environmental public policy, strategic environmental assessment and environmental accounting audit. According to Beuren (2006 p.83), exploring a theme "means joining further knowledge and incorporating original characteristics, as well as seeking new dimensions so far unknown".

The information was organized in two tables, one of which shows the limitations of EIA and the benefits of SEA in the establishment of potentially polluting enterprises or that can cause the depletion of natural resources, and the other shows the benefits of EAA to monitor potentially polluting enterprises or that can cause the depletion of natural resources. In addition, a graphic model was developed of the integrated action of the different mechanisms in an environmental policy, institutionalized and proposed.

4. Results and discussion

4.1. Limitations of Environmental Impact Assessment (EIA) and benefits of Strategie Environmental Assessment (SEA) in the establishment of potentially polluting enterprises or that can cause the depletion of natural resources

Although superficially, in subparagraph II of art. 9 of Law 6.938 (1981), it was established that the environmental policy instruments included the Environmental Impact Assessment [EIA], which according to Carvalho (2008, p. 61):

> [...] was incipient, to the extent that it neither established a minimum content, nor determined the preliminary nature of the study. Until 1980, impact studies were only required for industrial enterprises, developed in urban areas, and were not part of an environmental licensing procedure, previewed in Law 6.803/80.

Only five years later, CONAMA Resolution 001 was issued (1986), which established the definitions, responsibilities, basic criteria and general guidelines for the use and implementation of EIA as one of the instruments of the National Environmental Policy. In art. 2, it was determined that the licensing of activities that modified the environment would depend on the elaboration of EIS and the respective EIR, to be submitted to the approval of the competent environmental entity.

According to the Federal Public Prosecutor's Office (2004, p. 13), the EIS is defined as:

> [...] a study that links multi and interdisciplinary scientific investigation with assessment techniques. The general guidelines and related activities in the text of Resolution 001/86 constitute the characteristics of that Study. This refers to the accomplishment of an environmental diagnosis of a project's area of influence, within a historical perspective that underlies the prevision and assessment of the impacts and the proposal, in the same document, of suitable mitigation and compensation measures.

In accordance with Carvalho (2008, p. 55), the EIS is:

> [...] an instrument that, besides supporting precaution actions, serves as a base for the planning of environmental actions, as it assesses the environment before impacting activities are accomplished and infers the damage the enterprise can cause, thus providing instruments for the managers to assess and decide on the complete or partial feasibility or unfeasibility in the place chosen for its establishment.

Thirty-five years after the EIA, many authors have reassessed its efficacy in terms of biophysical environmental protection. According to Jay, Jones, Slinn, & Wood (2007), the EIA offers more comprehensive benefits, beyond those simply associated to the decisions of a specific project. Despite limitations, these authors call attention to its latent socio-ecological idealism: the transformative power of its environmental imperatives, influencing standards and customs.

In Conama Resolution 237 (1997), the enterprises and activities subject to environmental licensing are determined. According to Toro (2010), for example, financial incentives could be offered for EIA to take place voluntarily, covering a larger number of companies.

Various studies have shown that, when the impact assessment integrates three factors, that is, economic, social [particularly health] and environmental, like in the case of the sustainability impact assessment [SIA], the economic impacts attract more attention than the social and environmental ones (Morrisson-Saunders & Fischer, 2006; Smith, Fooks, Collin, Weishaar, & Gilmore, 2010). One of the crucial problems to achieve sustainability is the fact that the economic [and political] interests prevail in the current system and continue ahead of the advancement of their social and environmental trends (Ashford &

Hall, 2011). Due to this reality, according to Morrisson-Saunders and Fischer (2006), the protection of the biophysical environment, through EIA and SEA, should continue specifically for that purpose.

In subparagraph I of art. 9 of Conama Resolution 001 (1986), it is determined that the environmental impact report (EIR) should contain 'its relation and compatibility with the sectorial policies, plans and governmental programs', of which it is inferred that the latter should go through an SEA that would serve as the base for the EIA.

Thus, the SEA is a procedure that precedes and complements the EIA and, as an action instrument of the environmental policy, permits greater efficacy in the protection of the biophysical environment. As a counter-argument against the proposal to include the SEA as yet another action instrument of the environmental policy, Sánchez (2008) underlines that, before deciding on any form of institutionalization of the SEA, it is not only convenient but fundamental to emphasize the results it can achieve. According to the author, these results are more important than the administrative procedures or the means to achieve the expected goals.

In line with the suggestion by Sánchez (2008), in Figure 1, the limitations of the EIA and the benefits of the SEA are presented, considering the application of these instruments in some countries and sectors, with a view to comparing both.

Países e setores	AIA		AAE
	Situação	Limitações	Alternativa e benefícios
Países em desenvolvimento (Ebisemiju, 1993)	Conduzida como exercício técnico separado, divorciado dos aspectos técnicos e econômicos do planejamento do projeto; postscript do planejamento.	Conduzida no estágio da planta, quando a maioria dos detalhes foi finalizada e não há quase nenhuma oportunidade de se considerar alternativas; usada basicamente como um endosso de ações públicas ou privadas, e não para influenciar decisões.	Realização na fase de planejamento, que antecede a formulação das políticas, planos ou programas (aspecto pró-ativo), influenciando seus conteúdos e diretrizes; Permite a revisão da política estratégica, planta ou programa, com potencial de dinamizar e reforçar a AIA, contribuindo para o desenvolvimento sustentável.
México (Bojórquez-Tapia; García, 1998)	Percebida pelo público e responsáveis pelas decisões estratégicas como uma simples exigência burocrática.	Autoridades ambientais com capacidades técnicas medíocres; negligência dos setores poderosos, como infraestrutura, aos interesses das outras partes interessadas.	Favorece a aproximação setorial, com envolvimento de outras secretarias (transporte, energia) ainda na fase de planejamento; incentiva o treinamento de pessoal e o repasse de recursos materiais para os órgãos envolvidos.
Brasil (Glasson; Salvador, 2000)	Varia extremamente em suas natureza e eficácia dependendo da região, estado, ou municipalidade.	Nos estados menos desenvolvidos os Órgãos Estaduais de Meio Ambiente (OEMAs) são particularmente vulneráveis às pressões políticas e econômicas e a falta de dados ambientais é uma deficiência das mais significativas.	Facilita o desenvolvimento e a implantação de procedimentos de coordenação, de forma a evitar inconsistências e conflitos entre os objetivos, as metas e os atores participantes das políticas, planos ou programas, integrando as políticas; incentiva o treinamento de pessoal, o repasse de recursos materiais e a sustentação política das OEMAs.
Setor Elétrico na Amazônia (Egler, 2001)	Realizada para cada empreendimento em particular, após o planejamento concluído (aspecto reativo).	Limitadas possibilidades para modificação; restrito aos impactos diretos; tempo para realização costuma ser restrito.	Tempo para realização costuma ser maior; permite o uso de diferentes metodologias, mais adequadas para a previsão de outros impactos, como os cumulativos e indiretos; facilita a participação do público na escolha das melhores opções.

Figure 1. Limitations of Environmental Impact Assessment (EIA) and benefits of Strategic Environmental Assessment (SEA) in the establishment of potentially polluting enterprises or that can cause the depletion of natural resources

Source: Bibliographic research; different authors.

4.2. Benefits of Environmental Accounting Audit (EAA) in the monitoring of potentially polluting enterprises or that can cause the depletion of natural resources

According to subparagraph III to art. 6 of Conama Resolution 001 (1986), the SEA should define the measures to mitigate the negative impacts, including the control equipment and effluent treatment systems, assessing the efficiency of each. To accomplish these mitigating measures, the equity of the enterprise will be changed and it is to be expected that, in the company's accounting records, these changes will be present. Nevertheless, the environmental information disseminated in the financial statements is scarce, although different authors find that several companies invest in the environment, although they do not clearly disseminate these investments in their reports, which should be highlighted in accounting terms, offering benefits for the companies (Calixto, Barbosa, & Lima, 2007).

In subparagraph IV to art. 6 of the same Conama Resolution 001 (1986), the SEA should elaborate a program to accompany and monitor the positive and negative impacts, indicating the factors and parameters that are to be considered. According to Glasson and Salvador (2000), there is a distancing between the policy and the execution of the EIA and between the procedures and practices. According to the authors, what the monitoring is concerned, although the legislation establishes this procedure, it is rarely accomplished in practice. When comparing Brazil and the United Kingdom, the authors consider that both countries display shortages in that sector. Therefore, the monitoring needs to be improved and, according to the authors, it should be made compulsory, with periodical reports presented to the competent authorities.

Among other aspects, Toro (2010) considers that the absence of effective control mechanisms in the standards that regulate the SEA in Colombia makes this procedure hardly effective in the defense of the biophysical environment. According to Jay et al. (2007), few mechanisms aim to improve the efficiency of the SEA in the regulatory systems. A weak relation exists between the SEA of a project and its environmental management. It is important to establish a link between the responsible committees, like the mitigation planning and monitoring committees for example, which can be formalized through compliance commitments or other documents.

The public policies should be largely based on the power of the information available to the public with a view to channeling the community pressure on the companies that do not provide an appropriate response. It is the weakness of the control systems that motivates the polluters and other offenders to postpone their investments in environmental improvements (Margulis, 1996). Different accounting authors criticize the lack of standardization in the accounting disclosure of the environmental variable, besides indicating the need for an accounting audit of this information (Calixto *et al.*, 2007), with a view to better quality and greater transparency.

Figure 2 presents some elements verified in the Environmental Audit process, the verification instruments used, their limitations, and how the Environmental Accounting Audit can help to prove the information provided in the environmental reports.

O que verificar	Auditoria ambiental		Auditoria contábil ambiental
	Instrumentos de verificação	Limitações	Benefícios
1) Política Ambiental			
Qual o valor total de recursos destinados à proteção ambiental?	Questionário; entrevista com gestores; Relatório de Gestão; Relatório de Atividades	Trabalha com estimativas quando a origem da informação é valor exato; ausência de credibilidade das informações	Comprovação com base em registros contábeis da empresa e em documentos hábeis.
Que ações foram realizadas para atender a melhoria do controle de emissões, geração de resíduos e melhoria de destinação?	Questionário; entrevista com gestores; Relatório de Gestão ou Socioambientais; Relatório de Atividade	Ações passadas de difícil comprovação.	Acompanhamento histórico das informações; Identificação precisa da data, do valor e da origem dos recursos; comprovação com base em registros contábeis da empresa e em documentos hábeis
2) Investimento			
A empresa investe em eventos ou programas ambientais?	Questionário; entrevista com gestores; Relatório de Gestão; Relatório de Atividade; depoimentos de terceiros.	Dificuldade de dimensionar a amplitude da ação realizada e a época de realização.	Comprovação com base em registros contábeis da empresa e em documentos hábeis, com fácil identificação do valor e data do investimento.
A empresa incentiva a reciclagem, a reutilização e o retorno financeiro é contabilizado?	Questionário; entrevista com gestores; Relatório de Gestão; Relatório Sociambiental	Dificuldade de dimensionar valores e datas.	Comprovação com base em registros contábeis da empresa e em documentos hábeis, com fácil identificação de valores e de quantidades.
3) Processos de Produção e Operação			
Os processos de produção desenhados para minimizar os impactos ambientais estão implementados?	Questionário; entrevista com gestores; Relatório de Gestão e Sociambiental	Dificuldade de comparação da situação anterior e da situação atual	Comparabilidade com base em registros contábeis da empresa e nos demonstrativos contábeis
Houve modernização dos processos de produção com a aquisição de tecnologias limpas? Quando? Quanto custou?	Questionário; entrevista com gestores; Relatório de Gestão e Sociambiental	Dificuldade de comparação da situação anterior e da situação atual; Dificuldade de dimensionar valores e datas	Comprovação com base em registros contábeis da empresa e em documentos hábeis das aquisições, com fácil identificação de valores e de quantidades
4) Saúde Ocupacional			
Foram realizados gastos para melhorias internas e externas, mantendo a adequabilidade ocupacional no que se refere à iluminação, ventilação, odores e ruído?	Questionário; entrevista com gestores; Relatório de Gestão e Sociambiental	Dificuldade de comparação da situação anterior e da situação atual; Dificuldade de dimensionar valores e datas	Comprovação com base em registros contábeis da empresa e em documentos hábeis das aquisições, com fácil identificação de valores e de quantidades
Como a empresa gerencia o uso de equipamento de proteção individual (EPI) considerando as exigências legais? Há controle e registro dos EPIs?	Questionário; entrevista com gestores; Relatório de Gestão e Sociambiental	Dificuldade de comparação da situação anterior e da situação atual; Dificuldade de dimensionar valores e datas	Comprovação com base em registros contábeis da empresa e em documentos hábeis das aquisições, com fácil identificação de valores e de quantidades. Comprovação por meio dos controles de estoques.

Figure 2. Benefits of Environmental Accounting Audit (EAA) in the monitoring of potentially polluting enterprises or that can cause the depletion of natural resources

Source: The authors

The theoretical/conceptual analysis of public policies, strategic environmental assessment and environmental accounting audit has shown that, although with reasonable theoretical support, the Brazilian environmental public policy lacks a more comprehensive set of instruments that, in combination, achieve the expected results in terms of natural resource protection.

The use of the information obtained through SEA allows EIA to be practiced in a less punctual manner, as regional instead of just local information starts to be considered. This mechanism, together with the confirmation of the information in the environmental reports, through confrontation with the information registered in the financial statements, elaborated through the environmental accounting audit, enhance the effectiveness of the environmental public policy, as it starts to be concerned with the study and authorizing of enterprises' functioning from a broader, territorial perspective, focused on the veracity of the information provided.

4.3. New instruments for the Environmental Public Policy and the integrated activity model

Any public policy consists of a series of means through which the State acts, exerts or limits its power, such as the use of regulation, subsidies, information campaigns, among others, to influence the citizens' behavior and achieve the objectives of the public policy, solving the identified social problems and providing the citizens with the appropriate goods and services (Ollaik & Medeiros, 2011).

O'Toole Jr. (2000) elaborated a review of international studies developed in the field of public policies, emphasizing their implementation. According to that author, applying the execution theory of a public policy to practice is not easy. The reasons include the difficulty of the theoretical challenges, the different needs of those who practice it and the complicated normative issues. Anyway, different strategies can contribute to its effective execution. The construction of a theoretical consensus is one of them (O'Toole, 2004).

In line with Margulis (1996), there is a greater chance of successfully implementing the environmental policies when the governments, industries, the affected population and the holders of relevant information and specialization (universities, scientists, NGOs and information means) participate in their elaboration. According to the author, the policies will be more realistic and contain a broader base of knowledge, understanding and commitment of the stakeholders.

Departing from this premise, the integrated activity model proposed here is based on the need for the Strategic Environmental Assessment (SEA) to take place always and when development policies, plans or programs are defined, so that the establishment of an enterprise and the proper assessments of environmental impacts have these broader territorial or sectorial studies at their disposal for reference. The SEA can use the Economic Ecological Zoning (EEZ) studies, which is an instrument the Ministry of the Environment uses to plan and order the Brazilian territory, harmonizing the economic, social and environmental relations that happen within that territory. This instrument demands an effective effort towards institutional sharing, focused on the integration of territorial public actions and policies and the articulation with the civil society, joining their interests around a pact for territorial management.

When an enterprise is established, the EIS and the EIR are elaborated, which are more local studies but which, based on the SEA, can indicate negative environmental impacts and mitigating measures needed to limit the impact of the company's functioning to a minimum, not only at the local, but also at the territorial level. It should be highlighted that EIA results can influence the SEA, modifying its database and directions. After the establishment of the enterprise, the mitigating measures should be taken and, considering that all of these events cause alterations in the company equity, they should be registered in the financial statements (environmental accounting).

The environmental audits, done by multidisciplinary teams, should be combined with Environmental Accounting Audits, based on what is described in the Environmental Reports (EIS and EIR). The proposal for Environmental Accounting Audits includes the SEA, the EIA and the actual Environmental Audit, supported by the company's accounting records. The Environmental Accounting Audit verifies facts that deserve a new direction or correction, which will return to the company or will serve as the base to provide the environmental public policy with new directions. This mechanism has been detailed in Figure 1, as follows:

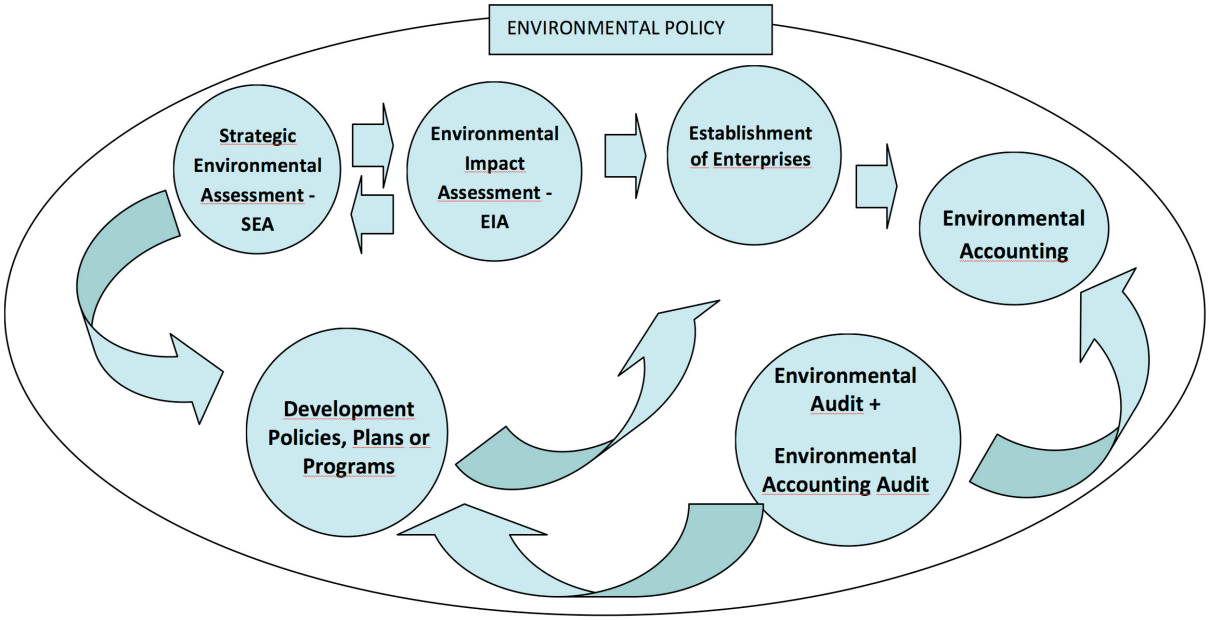

Figure 1. Integrated activity model of the Environmental Public Policy

Source: Elaborated by the authors.

The model presented here is also based on the premise of Jay *et al.* (2007) that the structure, procedures and techniques of the Environmental Impact Assessment (EIA) can and must be improved in order to achieve its objectives. The institutionalization of Environmental Accounting and the Environmental Accounting Audit as part of the Brazilian Environmental Public Policy aims for greater transparency of the environmental information the companies disclose as, despite companies' increasing environmental information disclosure in recent years (Calixto, 2007), different studies, like Monteiro and Ferreira (2007), Calixto (2007), Murcia *et al.* (2008) and Santos (2011), reveal that qualitative information is predominant. As regards the appropriateness of the social disclosure to the recommendations of NBC T 15 (Resolução CFC nº 1.003, 2004), based on the analysis of the management reports and explanatory notes of 23 publicly traded companies between 2005 and 2007, Beuren *et al.* (2010) concluded that the 'regular' classification was predominant. This fact indicates the need for compulsory environmental audits, so that the information becomes more quantitative and transparent. That is so because the data disseminated through the sustainability reports merely report on environmental events, but without any records in the account or values that can be translated into financial information. It is highlighted that accounting records will come with quantification, as any entry imposes an amount.

Finally, the study is based on the observations by Ollaik and Medeiros (2011), that studies need to be developed to provide new elements for the debate about the "best" governmental instruments and to solve the problems related to the lack of empirical elements for the debate. For the authors, it is undoubtedly necessary to improve the implementation of the public policies and results of studies on governmental instruments can contribute to this improvement, reducing the distance between the legislation that regulates the social and environmental activities and the accounting standards.

5. Final considerations

Based on the analysis of the results, it is verified that the environmental public policy, as an efficient environmental protection instrument, should include more actions, which affect the start, middle and end of the entire process, with a view to effective compliance with the intended objectives.

In this perspective, it is evidenced that strategic environmental assessment, as a proposed instrument for the environmental public policy, can contribute as a base for EIA, due to its more comprehensive range, as it assesses development policies, plans and programs. Hence, the establishment of enterprises should respect the decisions made at that level, that is, the EIA should be compatible and articulated with the SEA. Hence, the SEA serves as the initial phase of the establishment process of enterprises with potential environmental impacts.

Furthermore, it is inferred that, when the interactions between the enterprise and the environment cause equity changes, these should be registered in accounting. Therefore, the environmental accounting audit emerges as an instrument that can complement the environmental public policy by verifying the veracity of the information presented in the financial reports, in confrontation with that presented in the environmental reports.

It is highlighted that the absence of these instruments, SEA and EAA, in the initial and final phase, respectively, of the establishment and monitoring process of enterprises that impact the environment, and their non-compulsory status, revealed a gap and weak point in the environmental policy.

In that sense, the SEA and EAA are acknowledged as interrelated environmental public policy instruments, which should therefore function in an integrated manner. Hence, in function of this relevance, the need is highlighted to institutionalize them, as they can act as safeguards of the companies' private equity and the national environmental equity, besides guaranteeing the transparency of the environmental information disclosed to society, investors, employees, stock exchange analysis, auditors, among others.

Moreover, it is underlined that the EAA can contribute to the company, by safeguarding its equity from possible fines and prohibitions, proving that the activities developed were in compliance with the license granted by the environmental entity; as well as to the environmental entity, with a view to verifying whether the information presented as environmental impacts or mitigating measures were actually implemented and complied with the limit permitted in the EIS/EIR. Hence, the environmental audits by multidisciplinary teams should be complemented by the EAA, elaborated by accounting auditors.

Hence, studies are needed to monitor how the companies disclose the environmental information, looking for methods that help to improve the disclosure, considering the measuring (accessibility) and comparability. This mechanism can help the companies, clients, investors and auditors, preventing damage and safeguarding the corporate and national equity in terms of natural resources.

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