



THE BLUE AMAZON MANAGEMENT SYSTEM AS AN INSTRUMENT TO CONTRIBUTE TO THE STRATEGIC ENVIRONMENTAL ASSESSMENT OF PLANS, PROGRAMS AND PROJECTS IN GOVERNMENT SECTORS IN BRAZIL

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ABSTRACT

The objective of this study is to contribute to raising the awareness of decision-makers regarding the use of the Strategic Environmental Assessment (SEA) instrument, when used in conjunction with the Blue Amazonia Management System (SISGaaz), if applied in governmental Plans, Programs and Projects (PPP), ensuring that environmental values can be considered in the decision-making process, along with technical, social and economic aspects, preventing and eliminating impacts and cumulative effects on the environment. This requires a political awareness of those involved and a tool to support decision makers in order to optimize the risks involved. Thus, the evolution of legislation in the context of environmental impact studies and the environmental licensing process, the national and international experiences, the benefits and the main limitations of this instrument were raised in the literature. On the other hand, SisGaaz presents itself as a Brazilian Navy program that can contribute, as a tool, to the evaluation of the strategic environmental impact in public PPPs of the environmental area, due not only to its holistic view, but mainly due to the great interactivity that the SisGaaz will allow among the different systems of the strategic plan in the governmental sectors in the country.

Keywords: Strategic Environmental Assessment; SisGaaz; Plans, programs and projects (PPP); Brazilian Navy; Blue Amazon

1. INTRODUCTION

The Coastal Zone and the Marine Zone of Brazil have ecosystems of high ecological relevance, appearing as an area valued in terms of its wealth, its occupation, urbanization and industrialization process, being also strategic for navigation and exploration of oil, which, in turn, provides one of the greatest challenges for the country's environmental management, especially when addressed in Plans, Programs and Projects (PPP) from a Union, state and municipal perspective.

The environment offers to the society the essential conditions for its existence, survival and evolution and, consequently, the SEA of the PPP presents itself as an alternative to guarantee the sustainability of the ecosystems present. In this context, the preservation and environmental conser-

vation activities carried out by decision makers have gained prominence in recent years in Brazil.

Prior to 1988, Brazil already had legislation dealing with environmental issues, such as the forest code, which emerged in 1965. However, inspired by the National Environmental Policy Act (NEPA), published in 1969 by the US government, Brazil began to incorporate the environmental impact assessment (EIA) into the Brazilian legislation (Maciel, 2010). Due to the limitation of the EIA, an alternative to SEA emerges as a preventive tool that, based on a holistic and integrative vision, allows the evaluation of strategic development options, with the involvement of society and the reinforcement of the commitment to make transparent decisions.

Moreover, the relevance of the SEA as an instrument for environmental assessment is justified not only by the expect-



tation of a more integrated and participatory decision, but also by the fact that the Court Union Accounts (TCU) suggests, through judgment 464/2004, the adoption of SEA in the preparation of the Multi-Year plan and PPP planning, as an opportunity to improve legislation.

With the arrival of the pre-salt project and the recognition of the Blue Amazon as an extension of national sovereignty, it is necessary to elaborate an SEA that presents possible alternatives from a strategic point of view, from the environmental point of view, from the Social point of view and from the economical point of view, taking into account threats and opportunities in the PPP context, in order to support the decision-making of all stakeholders, including the diverse interests of the actors involved.

In this context, the problem of this research is to clarify and discuss the concepts related to the implementation process of the SEA, and the possibility of using this tool in conjunction with the Blue Amazon Management System (SisGaaz) when applied in government PPPs, aiming to increase the awareness of decision makers, the mitigation of risks in the process and the greater participation of society.

2. DEVELOPMENT

2.1. Study of environmental impacts

The Stockholm Declaration (1972) affirmed as basic principles the reconciliation between development and environmental protection and the safeguarding of natural resources for the benefit of present and future generations, highlighting the role of rational planning as an instrument to achieve these ends. (Ministry of the Environment, 2002).

From then on, the United Nations Environment Program (UNEP) was created in 1972 and the United States regulations in 1969, the latter instituting the Environmental Impact Assessment in the form of an Environmental Impact Statement (EIS), providing the opportunity for civil society to participate in the process of deciding the environmental viability of the enterprises.

In Brazil, the outcome of the Stockholm Conference was reflected in the creation of large-scale projects under the auspices of multilateral financing agencies, such as the Sobradinho Hydroelectric Plant, which was environmentally evaluated in the 1970s. The evolution came naturally, culminating with the publication of the instrument of the National Environmental Policy (PNMA - *Política Nacional de Meio Ambiente*), through Law No. 6.938/1981. This law classified the activities as effectively polluting, and established the National Environmental Council (CONAMA - *Conselho Nacional*

do Meio Ambiente), the body responsible for establishing standards and criteria for environmental licensing. CONAMA, in its Resolution 001/86, submitted the environmental licensing of certain activities that modify the environment to the elaboration of an environmental impact study and its environmental impact report (RIMA - *Relatório de Impacto sobre o Meio Ambiente*).

The National Environmental Policy (PNMA), published by law 6.938, dated August 31, 1981, reinforced by article 225 of the Federal Constitution of 1988, brought a new mentality in terms of environmental awareness to Brazil. The determination of the accomplishment of a previous study of environmental impact for the installation of works or activities in Brazil, potentially causing significant degradation to the environment, started to break the paradigm of the reactive response to a preventive action.

Shortly after, CONAMA, through Resolution No. 009/87, guaranteed the company's participation, making the environmental impact study/RIMA report a non-confidential document respecting industrial secrecy, which should be publicized through public hearings. The Federal Constitution of 1988, through chapter VI, aimed at the environment, in Article 225, defined the rights and duties of the Public Power and the community in relation to the conservation of the environment as a common use. With this, the environmental impact assessment is now required by the Government to install a work or activity, potentially causing significant degradation of the environment.

Environmental licensing

Based on licensing experiences in the country's environmental agencies, CONAMA resolutions evolved, resulting in resolution 237/97. According to the Resolution of CONAMA no. 237/1997, article 3, sole paragraph, the environmental body competent to the licensing actions has the autonomy to adapt the steps and requirements of the environmental licensing to the specific characteristics of the activity or enterprise. This body may also replace Environmental Impact Report or RIMA study, with more relevant and appropriate studies in cases where it is found that these are not the activity or enterprise potentially causing significant degradation to the environment. Thus, it is within its competence to define when and whether it is necessary to use specific environmental licenses, according to the nature, characteristics and peculiarities of the activity or undertaking, as well as the compatibility of the licensing process with the planning, implementation and operation stages.

According to CONAMA no. 237/1997, the process begins with the definition, involving the entrepreneur to prepare the documentation and the necessary environmental pro-



jects and studies at the beginning of the licensing. After the conclusion of this phase the entrepreneur requires the environmental license, making the proper advertising of the licensing of this act.

Both the Environmental Impact Study and RIMA report are elaborated from the Term of Reference (TR) prepared by the entrepreneur and submitted to the approval of the environmental agency, or by the TR issued by the environmental agency before the implementation of the enterprise or activity. The Environmental Impact Study should be developed according to the guidelines of the TR, and its purpose is to evaluate and monitor environmental damage in advance, studying the probable environmental consequences of the project or activity (Oliveira *et Coutinho*, 2013). The public power must demand it, as stated in article 225, paragraph 1, IV, of the Federal Constitution of 1988.

Some people confuse the Environmental Impact Assessment (EIA) with the Environmental Impact Study. The Environmental Impact Study is the set of studies carried out by specialists from different areas, with necessary technical details, generating conclusions about the possible environmental impact that the enterprise may cause. Above it is issued the RIMA, which will reflect the conclusions of the Environmental Impact Study, which should have its information translated in accessible language, illustrated by maps, charts, tables, graphs and other visual communication techniques, so that one can understand the advantages and disadvantages of the project, as well as all the environmental consequences of its implementation (Partidário, 2012).

Therefore, it is understood that the EIA goes well beyond Environmental Impact Study/RIMA report, since this instrument must be used in a preventive way, supported by environmental policies and management, in order to ensure that the enterprise being evaluated allows a multidisciplinary team to present diagnoses, descriptions, analyzes and evaluations of the actual and potential environmental impacts of this enterprise.

CONAMA nº237/97 regulated, in general rules, the competences at the federal, state and district levels, and the stages of the environmental licensing procedure, among other factors to be observed by the enterprises subject to licensing. In addition, this resolution assured the environmental agency the competence to define other environmental studies pertinent to the licensing process, verifying that the enterprise is not potentially causing significant environmental degradation.

According to Oliveira *et Coutinho* (2013), the environmental licensing process in Brazil begins with the feasibility analysis through a Prior Environmental Impact Study, which, when approved, proceeds with the previous license, which

determines the location and conditions for the next phases. From there, the installation license is issued, for the construction of the project and, finally, it continues with the operation license, which will allow the operation of the establishment. Each license is conditioned to the prior service of the conditions previously granted.

“Licensing has the primary purpose of preserving the environment against the economic requirements of entrepreneurs, and the granting of an environmental license application must be the option of the authority of the best alternative from an environmental point of view.” (Oliveira *et Coutinho*, 2013)

Regarding environmental crimes, on February 12, 1998, Law 9,605 was issued, originating from the Civil House of the Presidency of the Republic, which rose to the condition of crime the conduct harmful to the environment, resulting from non-compliance with the regulations affecting the environmental licensing. The law constituted as an environmental crime the construction, renovation, expansion, installation or operation, in any part of the national territory, of potentially polluted establishments, works or services, without license or authorization from the competent environmental agencies or contrary to the legal and regulatory norms pertinent to the licensing (Brazil, 1998). In this context, the environment becomes understood as an ecologically balanced environment, being regarded as public patrimony, right and duty of the whole community.

The environmental concern is not only restricted to the economic context, there is a need to think of a holistic and integrative vision among the various environmental problems, applying, as appropriate, a faster and more comprehensive response.

Thus, there was an evolution in terms of environmental concern, but this initiative was based only on economic variables of plans, programs and projects, without considering the holistic view of the environment (Oliveira *et Coutinho*, 2013).

The application of the PNMA, together with the CONAMA Resolution 01/86, made the strategic assessment only linked to the environmental licensing of ventures. This scenario provided a view that the Environmental Impact Assessment as a PNMA instrument was linked to individual projects, while the PNMA would be for broader actions involving PPP.

Rochette *et al.* (2014) report that regional initiatives would be the pillar for international environmental policies and that regional institutions would play a key role in linking global, national and local levels of governance with intrinsic co-responsibilities.



In the meantime, the PPPs, implemented by these regional institutions, are expected to emerge as an alternative to the use of SEA. In addition, considering that the environmental factor is inserted in conjunction with the preparation of policies, plans and programs, that is, in the context of environmental planning, it is fundamental to think of an SEA.

2.2. Strategic Environmental Assessment

The SEA becomes relevant from the concept of sustainability. Oliveira et Coutinho (2013) commented that this concept of sustainability arose from the Brundtland report mentioned in the preparation of the United Nations Conference (Rio 92):

“Sustainable development is the development that meets current needs without compromising the ability of future generations to meet their own needs.”

These authors reveal that sustainable development requires instruments that start from a holistic and integrative view of the various environmental problems and the need for economic development.

According to these authors, Principle 17 of the Rio Declaration at the Conference on Environment and Development - Rio 92, cited:

“The Environmental Impact Assessment, as an instrument, shall be carried out for planned activities that may have a significant adverse impact on the environment and are subject to the decision of a competent national authority.”

The Environmental Impact Assessment (EIA) can be defined as a series of legal, institutional and technical-scientific procedures, with the objective of characterizing and identifying potential impacts in the future installation of an enterprise, that is, to predict the magnitude and importance of these impacts (Bitar *et* Ortega, 1998).

As previously mentioned, the EIA has been a widely used instrument in Brazil since 1986, due to the legal requirements of the Environmental Impact Study and the RIMA Report. It is a preventive tool used in environmental policies and environmental management to ensure that a given project is analyzed in relation to its environmental impacts and that these impacts are considered in its approval process.

The limiting factor of the potential of the EIA is not to take “non-scientific” factors into account in decision-making, such as the political power of development agencies, interest groups and private institutions. (Teixeira, 2008)

According to Partidário (2012) the SEA can be defined as:

“An instrument of a strategic nature that helps create a development context for sustainability, integrating environmental and sustainability issues into decision making, and evaluating strategic development options against context conditions.”

The author reinforces this definition when she mentions that it is a decision support tool, which contributes by reinforcing society’s commitment to sustainable development, efficient resource management and the green economy. Although the SEA has its origin in the EIA, it differs from EIA because it has a long-term vision and objectives, it is uncertain in terms of defining what it is intended to be, it is a cyclical and continuous process, and it is carried out through the preparation and development of policies, programs and projects, among its main characteristics. The SEA can have two approaches: one as an extension of the EIA and another that is seen as a planning exercise involving sustainable considerations. This last approach, together with the holistic vision of SisGaaz, will allow the realization of SEAs of governmental PPPs, ensuring that environmental values are considered in the decision-making process, along with technical, social and economic aspects, preventing and eliminating impacts and cumulative effects on the environment.

The new SEA concept is not only intended to reactively assess the environmental impacts of the proposed policies, plans and programs but rather to assess the alternative views and development intentions embodied in PPPs by associating the full integration of the biophysical, economic, social and political dimensions, as well as a decision-driven approach that will influence the strategic decisions already selected (Partidário, 2012).

The European Community, through Directive 2001/42/EC, established that certain public plans and programs should be subject to an environmental assessment prior to their adoption, with a view to assessing the effects of these plans and programs (P&P). This requirement includes the drawing up of a first report to the European Parliament and to the Council, presenting the effects of the application and effectiveness of the P&P in terms of identification, description and evaluation and possible alternatives, as well as public consultations with environmental authorities and other Member States.

Among the situations that can trigger an SEA, the most important are the aid to the sectorial and spatial planning of a rural zone or a coastal zone, exploring the strategic situations with the best technology, location or level of investment, whose territorial area of intervention and the proposals and intentions are known.



In this context, the main distinction between SEAs and EIAs is not because SEAs are applied in policies, plans and programs while EIAs are applied only in projects, but because EIAs are focused on the effects of development on the environment while SEAs are focused on the assessment of these environmental effects on development, that is, the integration of environmental issues into the development process.

When evaluating a solution and controlling its environmental effects, the approach should be an SEA of the type EIA and when we want to evaluate a strategy to help improve development conditions, a strategic SEA should be adopted. In an EIA, the effects of the problems are evaluated and not the root cause of these problems, which, in this case, should be studied through an SEA.

For example, when assessing traffic jam, its effects on noise levels and air pollution can be assessed. The problem may lie in the sectoral decisions on land use, or on the urban structure, on the decision to develop new structures, types of sources, energy, among other possible factors. In this way, these variables will be analyzed from the point of view of the priority of choice under a strategic thinking of the SEA.

Partidário (2012) cites:

“Normally the SEA should formulate guidelines for planning (anticipating actions towards a desirable future), for management (goal oriented process management) and for monitoring (periodic monitoring of processes). The EIA is one of the tools for implementing the SEA guidelines. “

Therefore, the SEA must submit its approval through an EIA.

As an example of the application of EIA and SEA in Europe, Rochette *et al.* (2014) mention that with regard to the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), environmental protection recommendations were adopted following the code of conduct implemented in 2008 for the restoration and protection of endangered species in the Mediterranean Sea, with the purpose of raising situational awareness, providing more information and engagement of the stakeholders involved and the implementation of the EIA and SEA.

In another initiative in the Sargasso Sea in the North Atlantic, alliances and partnerships of organizations for regional, sectoral and international coordination of the region were carried out, with the objective of recogni-

zing the ecological significance, guaranteeing protection and justifying the existence of these alliances in areas of national jurisdiction.

2.3. Research methodology

As to the classification, this study, regarding its objectives, can be considered as an exploratory research. According to Gil (2010, p.27), this type of research “aims to provide greater familiarity with the problem, with a view to making it more explicit or constructing hypotheses.” Regarding the methods used, this research adopted the following guidelines: bibliographic and documentary research (Vergara, 2006).

In the bibliographic review, books, periodicals, theses, dissertations and scientific articles were consulted and, in documentary research, the ostensible guidelines of the Brazilian Navy, the Ministry of the Environment, the Ministry of Defense and the Civil Office of the Presidency of the Republic.

The survey was initially based on a query to the CAPES database with the keywords “strategic environmental assessment”, “decision making” and “Brazil”, in which 6951 evidences were represented by peer-reviewed journals and within a time window from 2012 until May 2017, returned 3,487 documents. From these documents, the ones that contained the terms “Plans, Programs and Projects” were filtered, adjusting the time window for the last 5 years, and the database for Elsevier, which resulted in 801 peer-reviewed journals. From this amount, the journals were selected and treated by reading the abstract and removing duplicate articles and documents without correlation with the text, which resulted in just over 30 scientific articles. The documentation analyzed in this study was mostly consulted through the websites of the executive branch. However, some publications can only be accessed through the MB intranet. Thus, the limitations of this study are related to the low availability of the SisGaaz subject in the literature and to the ostensive treatment as a necessary condition of this topic for this research.

The results obtained were separated into the following topics for a better chronological alignment of these concepts and discussed in the light of the difference between the main instruments and the legislation related to environmental licensing and the SEA: Environmental Impact Studies, Environmental Licensing, SEA, Application of SEA and Management System of the Blue Amazon. In the last two topics, its main applications will be shown in Brazil and abroad, and how SisGaaz could support strategic decision-making in the application of policies for the exploration of oil and its derivatives in the pre-salt region.



2.4. The application of strategic environmental assessment

The SEA Application: A Guide to Good Practice in Development Cooperation (OCDE, 2012) presents a number of case studies of SEA throughout the world, including the SEA training course in China, the development of SEA in Mozambique, the UNDP initiative for the development of SEA capacities in Iran, assessing the potential for introducing SEA in Nepal, monitoring results in the Water Supply and Sanitation Sector in Colombia, and the Sofia initiative in SEA.

According to Teixeira (2008), the practical studies have mainly involved the infrastructure sectors, with emphasis on electricity and oil generation, transportation, urban planning and tourism. In the sphere of public power, specific initiatives in Brazil were evidenced in São Paulo and Minas Gerais.

Margato *et Sanchez* (2014) analyzed 24 studies of SEA in Brazil and abroad and found that the highest frequencies are found in the Transportation (7), Oil and Gas (4), Electricity (3), Port (3), Planning (2), Tourism (2), Sanitation (2) and Agriculture (1), and that ten of these SEAs had external funding.

The Ministry of the Environment (2002) mentions three examples of the application of SEA with partnerships and alliances made in Brazil. A first example of the application of SEA in Brazil can be evidenced by the Tijuco Alto Hydroelectric Plant. The locations of dams and hydroelectric plants in the same hydrographic basin, as well as the respective scenarios of generation of cumulative impacts in the physical and regional biotic environment, have been the object of great controversy. The Tijuco Alto Hydroelectric Power Plant, located in the Ribeira de Iguape water catchment area, with a project approved by CONSEMA, kept its project under review by IBAMA for a long time, due to the fact that environmental entities resorted to the supplementary action of this institute.

Another example to be registered is river basin depollution programs, among which the Tietê River Cleanup Program in the Alto Tietê Basin, Metropolitan Region of São Paulo. Both the technological alternative for sanitary sewage treatment chosen under the program and the concentration of interventions in the main tributary were questioned. These questions were justified because of the lack of a systematic assessment of the impacts of pollution from river and tributaries, including diffuse pollution, and the problems due to increasing soil sealing and deforestation in all sub-basins. They were also justified by the lack of consideration in the program of the strategic objectives of other sectoral and environmental policies, especially those of the protection of water sources and the use of water resources.

As another example, the subject that most aroused debate in terms of the importance and the opportunity to carry out an SEA was the São Paulo Metropolitan Road Ring Project (Rodoanel). The main aspects of the discussion are related to the risks and opportunities arising from the strategic choice of the project, namely: the opportunity to move cargo transportation from within the metropolis (main road system of the Municipality of São Paulo), at the same time as this option presents chronic planning deficiencies for the implementation of a mass transport network; the inductive aspects of road construction in the context of metropolitan urban structure; the impacts resulting from increased land use and occupation in areas of strategic springs and biodiversity reserves in the region.

In the international scenario, Margato *et Sanchez* (2014) mention that SEA is used in several countries, and in Europe it is mandatory. In Brazil, SEA has been in use since 1994 and its benefits are tied to the Environmental Impact Study limited capacity to address cumulative impacts, better integration of policies, such as sectoral and urban planning policies and their potential to facilitate environmental licensing.

Xiuzhen *et al.* (2002) report that, in China, although SEA has not been mandatory, in recent decades and, specifically, in recent years, it has taken the place of Environmental Impact Study in the light of the limitations inherent to this type of study and the objectives of sustainable development desirable by the Chinese government. The obstacles to the application of the SEA would be the few case studies in which it was practiced and the restriction of society's participation in its process.

Oliveira *et al.* (2013) present a case study of an SEA developed in parallel with an EIA to improve the impact assessments of transport infrastructure in Brazil. These authors mentioned that the SEA should: assist the establishment of guiding criteria in the early stages of strategic decisions; create an opportunity to include environmental aspects early in the strategic decision-making process; see a long-term vision of transport policies; allow more space to accommodate the initially planned solution alternatives and those that arise at each decision level; promote layered decisions and reconcile state, regional and local strategies; include proactive actions, focusing on the positive impacts of the different layers of decision making, and allow the evaluation of sustainable alternatives not to be limited to project specifications.

More recently, due to controversies presented by the Environmental Impact Study regarding political decisions already taken or resulting from public policies already established, the licensing of the Belo Monte Hydroelectric Plant, built on the banks of the Xingu River in the Brazilian state of Pará, suffered serious paralysis that could have been avoided.



ded if there was an SEA.

Another example of the application of the SEA was evidenced in the problem situation during the elaboration of the doctoral thesis of Teixeira (2008), who defended a proposal for the planning of the supply of blocks for exploration and production of oil and natural gas in Brazil:

“Lack of environmental assessment process in the planning and negotiation processes that are associated with the decision to offer or not areas for the development of E&P activities, considering the possible effects of these activities on other options for the use of environmental and territorial resources and the level inherent in the oil and natural gas industry. “

Oliveira *et* Coutinho (2013) mention the SEA as a public participation tool to improve the transparency of decision-making, which can involve the community in strategic actions and link the SEA to an Agenda 21 proposal. It may involve geographical information systems (GIS) and multi-criteria analysis to access the impacts of planned activities on the vulnerability of a given area. In this case, it includes the definition of the impacts and objectives for which the vulnerability analysis will be done; preparation of vulnerability maps; the integration of different vulnerability maps; the identification through GIS of the impact weight and the alternatives of scenarios with less impact.

The authors also report the existence of a bill under way in the House of Representatives that foresees a change in the PNMA, in order to insert a provision on the SEA of policies, plans and programs. The project no. 261/2011, made by Deputy Marçal Filho and rapporteur of Deputy Gabriel Guimarães, features the following:

Art. 12-A. The direct and indirect public administration bodies are responsible for formulating policies, plans or programs that are required to carry out the strategic environmental assessment of these policies, plans or programs.

Paragraph (1): Strategic environmental assessment is understood as the set of activities aimed at predicting, interpreting, measuring, qualifying and estimating the magnitude and the spatial and temporal amplitude of the environmental impact, potentially associated with a given policy, plan or program, with a view to:

I – The option of technological or locational alternatives that mitigate adverse environmental effects;

II – The proposition of programs and compensatory actions of adverse environmental effects.

Paragraph (2): The implementation of the strategic environmental assessment does not exempt those responsible from submitting the projects that integrate the policies, plans or programs to the environmental licensing required in the form of article 10.

Paragraph (3): Significant changes in the content of policies, plans and programs also lead to the achievement of strategic environmental assessment.

Art. 12-B. The strategic environmental assessment shall comply with the following:

I – The evaluation will cover the whole process of formulating the policy, plan or program;

II – The analytical methodologies to be applied in the evaluation will be defined by the bodies responsible for formulating the policy, plan or program, observing the basic parameters defined in regulation;

III – Will be ensured in the evaluation:

a) Broad publicity of the activities carried out, and their results;

b) Participation of the population affected by the policy, plan or program.

Art. 12-C. The summary of the activities carried out within the scope of the strategic environmental assessment, and its results, will be consolidated in the Environmental Assessment Report (EAR), which will be publicized.

Single paragraph: When requested by an environmental body that is a member of SISNAMA, by the Public Prosecutor's Office or by fifty or more citizens, a public hearing will be held to discuss the EAR, pursuant to the regulation.

This bill no. 261/2011 was covered by bill no. 4996/2013, by Deputy Sarney Filho of the Green Party, which establishes the Strategic Environmental Assessment as a mandatory requirement in major infrastructure works, such as in the construction of hydroelectric dams.

From the proposal presented, it can be seen that the SEA and the Environmental Impact Study are totally different,



since the SEA's obligation is granted by the public authority, the purpose of the Environmental Impact Study is specific and the SEA is not an assignment of the entrepreneur. The EIA and the Environmental Impact Study differ from the SEA in four key aspects: territorial limitation, implementation time, level of detail and level of involvement in the decision-making process. In addition, SEA is distinct from environmental licensing because of the limitations of the Environmental Impact Study itself regarding the difficulty of deeply analyzing the location and technology alternatives and the difficulty of verifying cumulative and indirect impacts in detail. With this, the SEA should be proactive and serve as the basis for an environmental decision, as it allows the integration of several areas of knowledge to build a more complete analysis, based on economic, social and environmental variables, with the objective of achieving sustainable development, serving as an instrument for the formulation of PPPs (Oliveira et Coutinho, 2013).

Malvestio *et* Montañó (2012) presented the article "Efficiency of SEA applied to the energy sector in Brazil", also presented at the 1st Brazilian Congress of Impact Assessment, which showed that among the procedural effectiveness criteria used to evaluate 26 SEAs developed in Brazil, seven of them would be linked to government projects. Of the 16 criteria proposed and analyzed in these SEAs, only 12 were attended by more than 50% of SEAs. Among the criteria most cited by these SEAs are: elucidating the need for SEA implementation, describing the assessment environment, and presenting mitigation measures.

Margato *et* Sanchez (2014) emphasize the importance of the difference between the concepts related to effectiveness and quality, when inserted in the context of evaluation of the SEA. While effectiveness is related to achievement of objectives and adherence, supported by pre-established and agreed upon criteria, quality is affected by the degree of contribution to effectiveness. Based on this, different frameworks have been proposed in the literature by several authors to evaluate the effectiveness and quality of the SEA.

The authors concluded, based on the study of three case studies of SEA, using a framework proposed by Partidário (2012), used in Portugal, that the very low level of effective planning influence suggests that the effectiveness of the process is not a guarantee of result of the SEA and that the good quality of the reports does not guarantee their results. In addition, for SEA to be effective in countries where it is not mandatory, it needs to be linked to a well-defined decision-making context where its value can be well understood.

Considering the effectiveness and quality of an SEA, in which environmental aspects are embedded in the decision-making process, together with other aspects (technical, social and economic), a holistic approach is needed to con-

tribute to the strategic environmental impact assessment in public projects in the environmental area.

2.5. Management System of the Blue Amazon (SISGAAZ)

In Brazil, the riches at sea have aroused the lust and interest of various international actors. Because of this, especially with the discovery of the pre-salt, Brazil had to prepare to deal with the issue from a strategic point of view. According to the Brazilian Defense White Paper (Brazil, page 24, 2012), in order to achieve the strategic objectives, targets were established in the Brazil 2022 Plan, in which SisGaaz fits as an instrument to achieve these goals and to contribute to guarantee sovereignty, the Brazilian heritage and territorial integrity.

Thus, upon convocation by the Ministry of Defense, the Navy, the Army and the Air Force began to play a decisive role in ensuring the defense of that entire pre-salt area. According to the Brazilian Defense White Paper (Brazil, p. 71, 2012), "SisGaaz was designed to be a monitoring and control system related to the international concept of maritime security and protection of the Brazilian coast." The system aims to obtain situational awareness to respond promptly to crises or emergencies that occur on the Brazilian coast. As a benefit, it will have its dual employment (civil and military) and can be applied in the prevention of environmental pollution, meteorology, control of scientific research at sea, control of genetic heritage, prevention and repression of trafficking and security and defense of pre-salt (Brazil, 2012, p.195).

In this context, there was the need to develop a program to implement a system of surveillance and monitoring of the area of coverage of the Blue Amazon that provides a set of information capable of serving as a basis for decision-making and, when applicable, the establishment of response measures to a threat or identified emergency.

SisGaaz intends to implement the "Blue Amazon" Management System for monitoring and surveillance within the Brazilian jurisdictional waters (águas jurisdicionais brasileiras - AJB), in order to better equip the Force for the control of maritime traffic of interest in the South Atlantic, ensuring the safety of vessels carrying out activities of strategic value, increasing search and rescue capabilities (Brazil, 2012, p.102).

Thus, the main advantage of the use of this system is the collection, storage and distribution of information obtained by the entire chain involved with projects and ventures related to coastal activities, especially in what concerns the actors related to the environmental, technical, economic and social contexts.



SisGaaz, based on its holistic vision of the scenario as a whole, will create a contribution environment capable of assisting in an SEA for decision-making in relation to the various PPPs involved among the various governmental sectors in Brazil.

Nevertheless, SisGaaz has the objective of providing a set of strategic information to the decision-makers, so that within an SEA process, there is a better decision making considering the transparency of the process, the diverse interests and the involvement of the actors.

Environmental issues in Brazil have advanced a lot in recent years, as has the specific legislation that deals with this subject. According to Serpa (2002), the country does not have any legal and normative instrument that allow the public power to make demands and manage risks in a holistic way, requesting environmental studies at different levels of detail and complexity, or even following an environmental licensing process to an oil exploration platform in the pre-salt area, taking corrective action beforehand in situations of greater gravity. Therefore, the relevance of this work is related to the contribution that SisGaaz can exercise within a process of risk management and, more broadly, in the SEA process.

Thus, the preparation of this paper is justified by the sustainability point of view, as it will allow us to understand the SEA process and how SisGaaz can contribute to this process. This work will also take into consideration the technical, economic, environmental, social and academic point of view, since it will be able to anticipate the identification of the impacts and effects in relation to the decision process in PPP, it will be able to guide the stakeholders involved in the understanding and evaluation of the environmental consequences of a possible misapplication of an enterprise, it may promote the articulation of the various dimensions of the PPP, contributing to increase the transparency of strategic actions and the involvement of all the stakeholders of the process, as well as foster interest for possible academic research for the application of SisGaaz in other government sectors and in academia.

SISGAAZ as a decision-making instrument for the Navy

According to the Brazilian Defense White Paper (2012, page 102), SisGaaz was designed to be a monitoring and control system related to the international concept of maritime safety and to the protection of the Brazilian coast. It is the main command and control system of the Navy and includes activities of surveillance, monitoring, pollution prevention, natural resources management, among others.

The system consists of aircraft, fixed radars, unmanned aerial vehicles (UAVs) and modern communications by satellites, being able to: monitor Brazilian jurisdictional waters, preventing the circulation of unauthorized actors; ensure maritime commerce by monitoring merchant traffic; guide the vessels that need support through the exchange of information and naval presence in focal points; provide oil platform safety; reduce or eliminate the effects of incidents that may pollute the marine environment as well as those resulting from natural disasters; ensure the safety of navigation; guarantee and safeguard human life; combat transnational illicit acts and; prevent the occurrence of extreme natural phenomena.

The system will also be able to respond to crises or emergency situations through the positioning of naval, aerial and marine means, ensured by the increase of situational awareness. In line with the guidelines of the National Defense Strategy, SisGaaz will integrate with several systems, among which the SISFRON system of the Brazilian Army and the Brazilian Airspace Control System (SISCEAB) of the Air Force, making information and real-time knowledge available for the various systems that share data with it.

The United Nations Convention on the Law of the Sea (UNCLOS) establishes the concept of baselines from which they can be counted: the territorial sea (up to 12 nautical miles), the contiguous zone (up to 24 nautical miles), the exclusive economic zone (200 nautical miles) and the outer limit of the continental shelf beyond 200 miles, as well as the criteria for the delineation of the outer limit of the platform.

Article 76 of the UNCLOS states that:

“the continental shelf of a coastal State comprises the bed and subsoil of undersea areas that extends beyond its territorial sea, over the whole of the natural extension of its land territory, to the outer edge of the continental margin, or up to a distance of 200 nautical miles from the baselines, from which the breadth of the territorial sea is measured in cases where the outer edge of the continental margin does not reach that distance”.

Supported by this premise, coastal states can present to the UN their proposals to extend the continental shelf beyond 200 miles, within a maximum limit that will be measured from the foot of the slope of the Brazilian continental coast. The Brazilian government established a program, that is, the Brazilian Continental Shelf Survey Plan (LEPLAC), established by Decree No. 98,145 of September 15, 1989, which would have as its purpose the



determination of the ocean area included in addition to the exclusive economic zone, in which Brazil will exercise the exclusive rights of sovereignty for the exploration and exploitation of the natural resources of the bed and the subsoil of its continental shelf, as established in the UNCLOS. By means of Law 8,617 of January 4, 1993, the widths, counted from the baselines, were established for the Territorial Sea (12 nautical miles), the Contiguous Zone (24 nautical miles) and the Exclusive Economic Zone (200 Nautical miles). After reclaiming the areas under LEPLAC, Brazil will extend its continental shelf on its coast, which will result in an extraordinary area equivalent to 960 thousand square kilometers, where the pre-salt is located. The limits of Brazilian jurisdictional waters, subject to legal and juridical assessment and enshrined in multilateral treaties, guarantee economic rights, however, with the counterpart of political, environmental and public safety duties and responsibilities in an area of about 4.4 million square kilometers, which are equivalent to half the surface of the national territory on land. This area was called the Blue Amazon.

The Blue Amazon is an area rich in biodiversity and natural resources, among which are petroleum, gold, diamond, phosphate, cobalt, among other riches. According to the data collected on the website of the Directorate of Hydrography and Navigation, the Navy recognizes that the extreme need to monitor this vast area includes planning activities related to the national interest and the implementation of public policies defined for the maritime territory, as well as to the effective implementation of activities linked to the best use of the wealth and potential contained in the net mass over the seabed and in the seabed. Thus, in order to have a structure capable of supporting our rights at sea in the future, it is necessary to define and implement policies for the rational and sustained exploitation of the wealth of our Blue Amazon, as well as the means necessary for an adequate monitoring and protection of Brazil's interests at sea.

3. CONCLUSIONS

Environmental legislation in Brazil has evolved considerably, from a reactive stance to a preventive stance, which becomes evident after the emergence of SEA and the concept of sustainability.

Several preventive legal instruments such as EIA, Environmental Impact Study and RIMA report have been used in environmental policies and management in Brazil, but they do not take "non-scientific" factors into account during decision-making by interest groups.

The SEA emerges as a strategic tool, built under the pillar of sustainability, which takes environmental considerations and the opinion of stakeholders into account, considering non-scientific factors, to support decision making. It differs from the EIA because it has long-term objectives, is uncertain in its decision alternatives and presents itself in a cyclical and continuous way, and it is ideal for the development of PPPs.

In Brazil, the SEA was mainly developed in the infrastructure sectors, with emphasis on the sectors of transportation, urban planning and tourism.

The importance of SEA as a tool for public participation to improve transparency in decision making involving stakeholders in strategic actions has been evident since its use in P&P by the European Community, as required by Directive 2001/42. If it is integrated with the information systems provided by the command and control systems of the Navy, it may enable its potential effectiveness and quality. In this context, its contribution is clearly made as an instrument to increase the awareness of decision-makers. However, the very low level of effective influence in PPP planning does not guarantee the effective outcome of the SEA, as well as its quality by analyzing the generated reports.

SisGaaz appeared as a relevant strategic decision element when Brazil extended its continental shelf at its own expense by means of LEPLAC and began exploring Petroleum in the pre-salt layer. In this context, from the availability of information in real time, the contribution of the integration of SisGaaz becomes evident as a formulating factor for information, by its dual use, with civil and military application, in a process of risk management and, more broadly, in the SEA process, with a focus on the PPPs for the exploration of oil and its derivatives in the pre-salt.

This work allowed us to understand the SEA process and how SisGaaz could contribute to it in terms of increasing the awareness of decision-makers, mitigating risk in the process and increasing the participation of society. In addition, it will allow anticipating the identification of impacts and effects in relation to the PPP decision process; it will guide stakeholders involved in understanding and assessing the environmental consequences of a possible misconduct of an enterprise; it will promote the articulation of the various dimensions of the PPPs, contributing to the increase of the transparency of the strategic actions and the involvement of all the stakeholders of the process and; it will foster the interest for possible future academic research for the application of SisGaaz in other governmental sectors and in the academic environment.



Nonetheless, the SEA needs to be linked to a well-defined decision-making context, such as in the oil exploration PPPs in the pre-salt, where its value needs to be well understood by decision-makers in order to ensure, in a rational and sustained way, the effectiveness in the security of the riches of the Blue Amazon.

It is suggested that other works may continue this topic, evaluating and testing a real case of PPP, such as, for example, a supply of blocks for the exploration and production of oil in Brazil, in an SEA process, using strategic data provided by SISGAZ.

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