

# The regulation of Strategic Environmental Assessment in Brazil

*A regulamentação da Avaliação Ambiental Estratégica no Brasil*

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## ABSTRACT

The practice of Strategic Environmental Assessment (SEA) has been expanding worldwide, aiming to include environmental issues within strategic planning. However, there is no precise regulation of SEA application in Brazil, and this practice is not systematic. In this context, this paper aimed to evaluate proposals for regulating SEA in Brazil regarding the elements of a SEA system. Documented proposals were identified through literature reviews, and the identified 14 documents' content was analysed according to best practice criteria. Gaps were identified in all proposals, and none of the proposals met all the criteria applied in this research. The definition of objectives and SEA field of application was the criteria best reached (present in more than 70% of the documents). However, most of the proposals were limited only to these points, missing other essential elements of a SEA system. These results indicate a low institutional maturity concerning SEA in Brazil.

**Keywords:** SEA system. Policies, Plans and Programs. Environmental legislation.

## RESUMO

*O uso da Avaliação Ambiental Estratégica (AAE) tem expandido, buscando promover a inserção de questões ambientais no planejamento estratégico. No Brasil, o sistema de AAE não está devidamente regulamentado, e a prática da avaliação não é sistemática. Nesse contexto, este trabalho se propõe a avaliar as propostas de regulamentação da AAE no Brasil à luz dos elementos que compõem um sistema de AAE. O levantamento dos casos se deu por meio de revisão bibliográfica, seguida pela análise do conteúdo das 14 propostas identificadas. Os resultados evidenciam que todas as propostas avaliadas apresentam lacunas, sendo que nenhuma contempla os nove critérios observados nesta pesquisa. A definição de objetivos e do campo de aplicação da AAE foram os critérios melhor atendidos. Porém, a maior parte das propostas se limitou a isso, não contemplando os demais elementos de um sistema de AAE. Esses resultados indicam uma baixa maturidade institucional em relação à AAE.*

*Palavras-chave: Sistema de AAE. Políticas, Planos e Programas. Legislação ambiental.*

## 1 INTRODUCTION

The Strategic Environmental Assessment (SEA) is an environmental policy instrument characterised as a systematic and participatory process that aims to ensure that relevant environmental issues are integrated into strategic decision-making from the initial stages (PARTIDÁRIO, 2021).

SEA originates from the United States National Environmental Policy Act (Nepa), the first piece of legislation to address environmental impact assessment in 1969 (FISCHER, 2007; JAY *et al.*, 2007; MORRISON-SAUNDERS; FISCHER, 2006). Worldwide, impact assessment was initially applied mainly to projects; however, in the 1980s, the need to assess the impacts of strategic decisions (prior to projects) became widely recognised (FISCHER; GONZÁLEZ, 2021).

In this context, Strategic Environmental Assessment emerged as an instrument for assessing the environmental impacts of Policies, Plans and Programs (PPPs) (FISCHER; GONZÁLEZ, 2021), mainly based on the perception that the assessment applied only to projects had several limitations (BINA, 2007; PARTIDÁRIO, 1996; SMITH; SHEATE, 2001).

Since then, Strategic Environmental Assessment systems have been established, formally or informally, by an increasing number of countries (more than 60 in 2021 (FISCHER; GONZÁLEZ, 2021)) and organisations (e.g. World Bank). Thus, SEA has been practised in all continents and different development contexts (CHAKER *et al.*, 2006; SADLER *et al.*, 2011).

A SEA system is the set of characteristics and guidelines for the instrument's practice, including the types of planning processes that require a SEA (screening criteria), stakeholders involved, and assessment procedures (SEHT, 1999). However, since SEA must be adapted to the context in which it will be applied (HILDING-RYDEVIK; BJARNADÓTTIR, 2007), SEA systems vary depending on several factors such as the motivators and arguments that justify its application (BINA, 2007; FISCHER, 2003).

In Brazil, over the years, there have been attempts to institutionalise SEA (and similar assessments) as an environmental management instrument; they include legal and institutional initiatives to require SEA application for PPPs generally and to specific sectors such as tourism transport (MONTAÑO; MALVESTIO; OPPERMANN, 2013) and energy (VILARDO *et al.*, 2020). However, SEA is not yet regulated adequately by Brazilian legislation, is not applied systematically and is vulnerable to the circumstances in which it is practised (MALVESTIO; MONTAÑO, 2019; SILVA; SELIG; BELLEN, 2014).

The SEAs carried out are mainly voluntary and were encouraged by multilateral development agencies (PELLIN *et al.*, 2011; SÁNCHEZ, 2017). However, although some practices have positive effects (such as favouring communication between the stakeholders involved), SEA has had a low influence on decision-making (MALVESTIO; MONTAÑO, 2019; MARGATO; SÁNCHEZ, 2014; TSHIBANGU; MONTAÑO, 2019).

Thus, SEA in Brazil has been practised within a diffuse and flexible framework, with low learning capacity (MALVESTIO; MONTAÑO, 2019; MONTAÑO; MALVESTIO; OPPERMANN, 2013), and with no distinctness regarding objectives, guidelines and procedures (MONTAÑO; TSHIBANGU; MALVESTIO, 2021a). In this context, the definition of SEA guidelines in Brazil and possible implications of its regulation as a mandatory instrument are issues that the literature has debated (e.g. MONTAÑO; FISCHER, 2019; MONTAÑO; TSHIBANGU; MALVESTIO, 2021a; SÁNCHEZ, 2017).

According to Fonseca and Gibson (2020), the *ex-ante* evaluation of environmental assessment laws offers the opportunity for a better understanding of the proposed scope, indicating gaps and possible problems that should be the focus of legislators and other stakeholders. Therefore, knowing the

content of the various proposed regulation for SEA in Brazil can contribute to the debate on improving the Brazilian SEA system. In this context, this study aimed to assess how the Brazilian SEA regulation proposals approach the elements of a SEA system.

The paper consists of six sections. After this introduction, a brief theoretical framework on SEA systems is presented, followed by the presentation of the methodology. Then, in sections three and four, the results are presented and discussed. Finally, conclusions are presented in section five.

## 1.1 SEA SYSTEMS

Strategic Environmental Assessment systems are composed of a series of elements that design the assessment practice, including the SEA objectives (PARTIDÁRIO, 2012; THERIVEL, 1993), the types of strategic actions that require to be assessed (DUSIK; SADLER, 2004; THERIVEL, 1993), assessment procedures (FISCHER, 2007; MONTAÑO *et al.*, 2014; THERIVEL, 1993), SEA methods (FISCHER, 2007; THERIVEL, 1993), SEA validation procedures (e.g. report review and approval, public participation) (PARTIDÁRIO, 2012; THERIVEL, 1993), the extent to which decision-makers have to consider SEA (THERIVEL, 1993), stakeholders and their responsibilities (DUSIK; SADLER, 2004; MONTAÑO *et al.*, 2014; PARTIDÁRIO, 2012; THERIVEL, 1993), the mechanisms for SEA system formalisation (e.g. legal framework, guidelines) (DUSIK; SADLER, 2004; FISCHER, 2007; PARTIDÁRIO, 2012; THERIVEL, 1993; WALLINGTON; BINA; THISSEN, 2007) and available resources (FISCHER, 2007).

However, the context within which SEA is implemented – characterised by normative, theoretical and political assumptions and expectations regarding SEA effectiveness – strongly influences the SEA system (HILDING-RYDEVIK; BJARNADÓTTIR, 2007; VICTOR; AGAMUTHU, 2014). Therefore, the context must be considered when defining a SEA system (BINA, 2008). The motivators and arguments that justify the need for a Strategic Environmental Assessment are essential aspects for defining a SEA system (BINA, 2007; FISCHER, 2003). Hilding-Rydevik and Bjarnadóttir (2007) stated that it is fundamental to identify the specific needs of the context in which SEA will be applied (e.g. the need to change decision-makers' mindsets or to produce information on environmental impacts).

Despite being difficult to identify what is needed in each context (HILDING-RYDEVIK; BJARNADÓTTIR, 2007), this knowledge may enable the definition of SEA objectives, role and approach to be context-oriented, focusing on the most critical challenges and gaps, and being consistent with institutional, planning and cultural characteristics (BINA, 2007).

Another important aspect regarding the definition of a SEA system is its formalisation. SEA has been commonly regulated through legal provisions and a mandatory instrument (TETLOW; HANUSCH, 2012). This is the case, for example, of the European Union (EUROPEAN COMMISSION, 2001), several African countries (LOAYZA, 2012) and Asian countries (LOAYZA, 2012; VICTOR; AGAMUTHU, 2014). The definition of legal requirements has been argued to be of great importance, especially in contexts where the planning system is not transparent (FISCHER, 2007; FISCHER; GAZZOLA, 2006).

On the other hand, some authors argue that detailed regulation can be negative, conflicting with the idea of flexibility and adaptability of SEA, especially for SEA applied to policies (CHERP; WATT; VINICHENKO, 2007; KØRNØV; THISSEN, 2000). In this sense, KørnøV and Thissen (2000) suggest that legislation should indicate what SEA should achieve but not precisely how to do it.

Cherp, Watt and Vinichenko (2007) indicate the 'adaptive SEA system' as a possibility, in which the SEA approach would be chosen based on the specific characteristics of each planning and decision-making process. A similar proposal was presented by Fischer and González (2021, p. 433) based on what the authors called the "selection logic" for SEA, which aims to encourage those involved in the assessment to define the most appropriate processes, strategies, and methods for each situation.

Moreover, there are systems in which SEA is 'voluntary', such as is South Africa and New Zealand, where considering environmental effects in decision-making is legally required, but there is no legal provision for SEA application (MORGAN; TAYLOR, 2021; RETIEF; STEENKAMP; ALBERTS, 2021). Nevertheless, some benefits from SEA application have been observed in these contexts, for example, information provision and awareness of sustainability issues and SEA adaptation to different needs in South African cases (RETIEF, 2007; RETIEF; STEENKAMP; ALBERTS, 2021) and the achievement of a more integrated planning process in New Zealand case (FISCHER, 2007).

However, limitations directly linked to the absence of an explicit definition of a SEA system were also observed in both cases, such as the lack of clarity regarding SEA application, the overlap with other instruments and difficulty in promoting learning from practice (MORGAN; TAYLOR, 2021; RETIEF; STEENKAMP; ALBERTS, 2021).

## 2 METHODOLOGY

In this paper, qualitative methods – bibliographic review and document and content analysis – were applied for accessing and analysing the proposed regulation for SEA in Brazil.

Three steps were followed. First, a bibliography review was carried out to identify proposed SEA regulations. Articles – published in national and international scientific journals – were searched through *Portal Capes* (a Brazilian citation database) and Scielo in March 2020. The search terms used were "Strategic Environmental Assessment", "Regulation", and "Brazil", resulting in about 40 papers. Within the papers, mentions about SEA regulation in Brazil – at its different administrative levels – were sought. However, many of the papers identified did not mention specifically any proposed regulation for SEA and were discarded. It is essential to highlight that this review was not a systematic bibliography review but intended only to identify the various proposed regulations for SEA.

For the states that had a proposed regulation for SEA, the official state website was consulted, and the proposed regulation was accessed; in the case of regulations in force, the current and updated legal documents were used. The same procedure was repeated at the federal level.

The second research step was the definition of criteria to analyse the proposed regulations. The criteria selection was based on the theoretical framework that supported this paper (section 2 and Table 1) and sought to include the elements of a SEA system that outline the assessment practice according to the literature. As shown in Table 1, nine criteria were defined. All of them can be applied to a normative text, and they aim to enable a general understanding of the SEA systems designed by the proposed regulations.

**Table 1 |** Analysis criteria applied to the proposed regulations for SEA in Brazil.

| <i>Identification</i>  | <i>Criterion</i>   | <i>References</i>  |
|------------------------|--|--|
| <i>a – Objectives</i>  | Defines SEA objectives   | Partisan (2012); Therivel (1993)   |
| <i>b – Application</i> | Defines the types of strategic actions that require to be assessed (administrative and strategic levels, sectors, public/private planning) | Dusik and Sadler (2004); Montañaño <i>et al.</i> (2014); Therivel (1993) |
| <i>c – Procedure</i>   | Defines SEA procedures   | Fischer (2007); Montañaño <i>et al.</i> (2014); Therivel (1993)          |
| <i>d – Methods</i>     | Defines SEA methods  | Fischer (2007); Therivel (1993)  |
| <i>e – Validation</i>  | Defines SEA validation procedures (e.g. report revision and approval, public participation)  | Partisan (2012); Therivel (1993)   |

| Identification                        | Criterion  | References   |
|---------------------------------------|--|--|
| f - Link with decision                | Defines how the decision-making process must consider SEA (i.e. if SEA is binding or indicative)                           | Therivel (1993)  |
| g - Stakeholders and responsibilities | Defines the stakeholders and their responsibilities (i.e. defines who must prepare the SEA, who must review the SEA, etc.) | Dusik and Sadler (2004); Montaña <i>et al.</i> (2014); Partisan (2012); Therivel (1993)                        |
| h – Guidelines                        | Predicts mechanisms to guide SEA practice (e.g. published methodological guidelines)                                       | Dusik and Sadler (2004); Fischer (2007); Partisan (2012); Therivel (1993); Wallington, Bina and Thissen (2007) |
| i – Resources                         | Defines resources for implementing SEA system  | Fischer (2007)   |

Source: Authors.

Finally, in the third step of the research, the content of the identified proposed regulations was qualitatively analysed. All the documents were read and analysed whether the text provided information about each element addressed by the analysis criteria. Each criterion was evaluated as present or absent.

This research was limited to evaluating the presence or absence of each criterion, allowing the identification of SEA system elements addressed by the proposed regulations and their gaps. Therefore, a qualitative analysis of the proposal adequacy was not performed. This methodological choice was based on the understanding that SEA systems must be adapted to the context where applied (HILDING-RYDEVIK; BJARNADÓTTIR, 2007) and that the analysis of the adequacy of what is proposed must be context-specific (which is beyond the scope of this paper but is a critical approach to be considered by future research).

The term "yes" indicated that the proposed regulation addressed a criterion, and the term "no" indicated its absence.

### 3 RESULTS

Based on a bibliographic review, it was identified that Brazil did not have a federal regulation in force to address SEA comprehensively. However, the Interministerial Ordinance nº 198/2012, despite not using the term "Strategic Environmental Assessment", established and regulated the Environmental Assessment of Sedimentary Area (Easa). Easa is a "SEA type" instrument (VILARDO *et al.*, 2020, p. 264) for assessing maritime and terrestrial sedimentary basins. Other proposed federal regulations identified in this research were bills that were filed or bills that were going through the legislative process.

At the state level, it was identified that São Paulo, Minas Gerais and Bahia had their regulations referring to SEA application in their territories. Five proposed regulations were identified at the state level: three from the state of São Paulo (a State Law, a State Decree and a Resolution of the Secretary for Environment), one from the state of Minas Gerais (a State Decree) and one from the state of Bahia (a State Decree). Moreover, the state of Rio de Janeiro had a bill addressing SEA.

Fourteen legal initiatives (proposed regulations or regulations in force) were identified (Table 2), and all of them were accessed and analysed. Results are presented in Table 3 and Figure 1.

**Table 2** | Proposed regulations for SEA in Brazil and their scope of application and status in January 2021.

| <i>Proposed regulation for SEA</i>  | <i>Scope of application</i> | <i>Status</i>                         |
|---|-----------------------------|---------------------------------------|
| State Secretary for Environment Resolution nº 44/1994                             | State of São Paulo          | In force                              |
| Federal Bill nº 2072/2003   | Federal                     | Filed                                 |
| State Decree nº 43372/2003  | State of Minas Gerais       | In force                              |
| State Decree nº 11235/2008  | State of Bahia              | In force                              |
| State Law nº 13798/2009   | State of São Paulo          | In force                              |
| State Decree nº 55947/2010  | State of São Paulo          | In force                              |
| Interministerial Ordinance nº 198/2012  | Federal                     | In force                              |
| State Bill nº. 2261/2013  | State of Rio de Janeiro     | Filed                                 |
| Federal Bill nº. 4996/2013  | Federal                     | Attached to Federal Bill nº 3729/2004 |
| Federal Bill nº 5716/2013   | Federal                     | Attached to Federal Bill nº 3729/2004 |
| Federal Bill nº 8062/2014   | Federal                     | Attached to Federal Bill nº 3729/2004 |
| Senate Bill nº 168/2018   | Federal                     | Ongoing legislative process           |
| Federal Bill nº 4093/2019   | Federal                     | Ongoing legislative process           |
| Global Sub-Amendment of the Plenary of August 8, 2019 - Federal Bill nº 3729/2004 | Federal                     | Ongoing legislative process           |

*Source: Authors.*

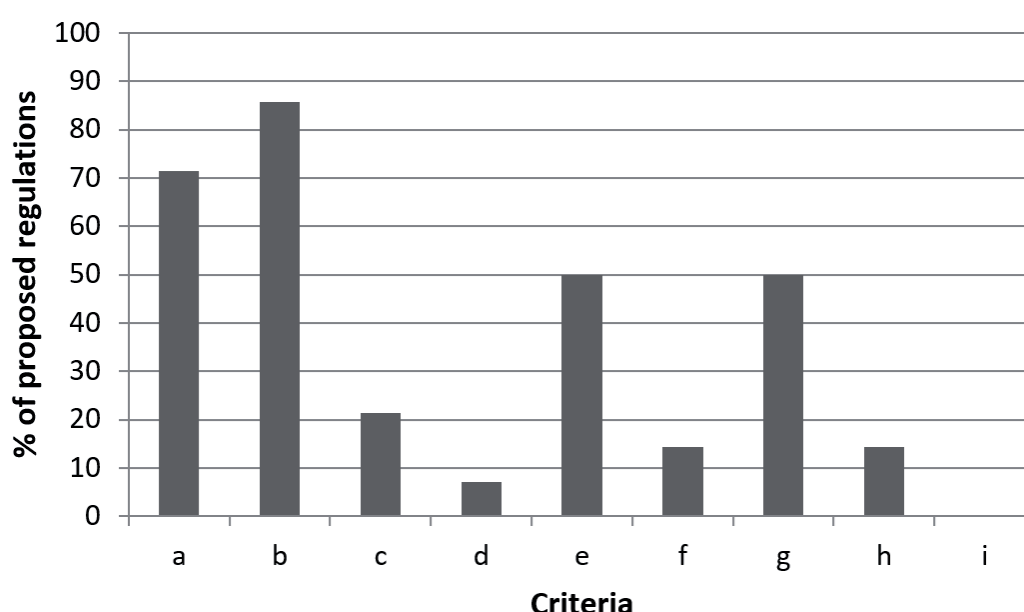
**Table 3** | Analysis of the proposed regulations for SEA in Brazil.

| <i>Proposed regulation for SEA</i>                    | <i>Scope of application</i> | <i>Criteria</i> |          |          |          |          |          |          |          |          |
|---|-----------------------------|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|
|   |                             | <i>a</i>        | <i>b</i> | <i>c</i> | <i>d</i> | <i>e</i> | <i>f</i> | <i>g</i> | <i>h</i> | <i>i</i> |
| State Secretary for Environment Resolution nº 44/1994 | State of São Paulo          | no              | no       | no       | no       | no       | no       | no       | no       | no       |
| Federal Bill nº 2072/2003                             | Federal                     | yes             | yes      | no       | no       | no       | no       | no       | no       | no       |
| State Decree nº 43372/2003                            | State of Minas Gerais       | no              | yes      | no       | no       | no       | no       | yes      | no       | no       |
| State Decree nº 11235/2008                            | State of Bahia              | no              | yes      | no       | no       | no       | no       | yes      | yes      | no       |
| State Law nº 13798/2009                               | State of São Paulo          | yes             | yes      | yes      | no       | yes      | no       | yes      | no       | no       |
| State Decree nº 55947/2010                            | State of São Paulo          | yes             | yes      | yes      | no       | yes      | no       | yes      | no       | no       |
| Interministerial Ordinance nº 198/2012                | Federal                     | yes             | yes      | no       | no       | yes      | yes      | yes      | no       | no       |
| State Bill nº. 2261/2013                              | State of Rio de Janeiro     | yes             | yes      | no       | no       | yes      | no       | no       | no       | no       |



| Proposed regulation for SEA   | Scope of application | Criteria |     |     |     |     |     |     |     |    |
|---|----------------------|----------|-----|-----|-----|-----|-----|-----|-----|----|
|   |                      | a        | b   | c   | d   | e   | f   | g   | h   | i  |
| Federal Bill nº. 4996/2013  | Federal              | yes      | yes | no  | no  | yes | no  | no  | no  | no |
| Federal Bill nº 5716/2013   | Federal              | yes      | yes | no  | no  | yes | yes | yes | yes | no |
| Federal Bill nº 8062/2014   | Federal              | no       | no  | no  | no  | no  | no  | no  | no  | no |
| Senate Bill nº 168/2018   | Federal              | yes      | yes | no  | no  | no  | no  | no  | no  | no |
| Federal Bill nº 4093/2019   | Federal              | yes      | yes | yes | yes | yes | no  | yes | no  | no |
| Global Sub-Amendment of the Plenary of August 8, 2019 - Federal Bill nº 3729/2004 | Federal              | yes      | yes | no  | no  | no  | no  | no  | no  | no |

Source: Authors.



**Figure 1 |** Percentage of proposed regulations – in relation to the total number of proposals (14) – that include each criterion evaluated.

Source: Authors.

Among the proposed regulations, two stand out for not meeting any criteria: the Resolution of the State Secretary for Environment nº 44/1994 (state of São Paulo) and the Federal Bill nº 8062/2014. The first is the oldest Brazilian normative that mentions SEA; however, it was restricted to creating a Strategic Environmental Assessment Commission; the commission would be responsible for verifying the consideration of environmental issues in policies, plans and programs (PPPs) of public interest. However, the Resolution did not address who should compose this SEA commission or how it should act, nor did it mention other elements for a SEA system.

The second is a Federal Bill on Environmental Licensing, which mentions SEA only to suggest that enterprises located in areas that a SEA has assessed should be exempt from the Environmental Licensing or subjected to a simplified Environmental Licensing process. The link between SEA and the assessment of projects is relevant and must be legally predicted (GONZÁLEZ; THERIVEL, 2022); however, this bill only mentioned this possibility without specifying how it should be done.

None of the proposals analysed met all the criteria; 50% (seven proposals) met only two or three criteria, and 36% (five proposals) met five or six criteria (Table 3).

The criteria more frequently met were the criterion that refers to the definition of the strategic actions that should be subject to a SEA (criterion b), which was present in 12 proposed regulations (i.e. in all the proposals, except for the two that only mentioned the SEA) and the criterion that refers to the definition of SEA objectives (criterion a), present in ten proposals (Figure 1). The criteria that refer to the definition of SEA validation procedures (criterion e) and the definition of the stakeholders and their responsibilities (criterion g) were addressed by 50% of the cases (seven proposals) (Figure 1).

Regarding SEA objectives and types of strategic actions that should be assessed, it was observed that the proposed regulations express different expectations for SEA, for example: to promote territorial planning, to evaluate PPPs in relation to climate change, and to evaluate locational alternatives and propose mitigation and compensation measures to environmental impacts of projects. The latter reflects an apparent confusion between SEA and EIA of projects.

The presence of the other criteria – definition of procedure (c), methods (d), link with the decision (f) and guidelines (h) – was restricted to five of the proposed regulations (Table 3). Two of them are from the state of São Paulo and are regulations in force: the State Law nº 13798/2009, which establishes the State Policy on Climate Change (SPCC), and the State Decree nº 55947/2010, which regulates the SPCC and details the SEA system elements that were already indicated by the policy. Both define that SEA aims to systematically analyse public and private PPPs in the face of climate change. In addition to SEA objectives and field of application, these proposals define SEA elaboration and validation procedures and define the stakeholders and their responsibilities.

Another proposed regulation that addresses more criteria is the Interministerial Ordinance nº 198/2012. This regulation establishes the environmental assessment of sedimentary areas subject to oil and natural gas exploration, and it was called Easa. In addition, this regulation explicitly addresses that Easa must be considered by decision-making regarding the exploration of oil and gas (criterion f), a SEA system element that is rarely addressed by the proposed regulations evaluated in this research (two out of 14 proposals).

The two cases that addressed the highest number of criteria (six criteria each) were the Federal Bill nº 5716/2013 and the Federal Bill nº 4093/2019. While defining a more significant number of elements for the SEA system, the first indicates the same objectives for the Environmental Impact Statement (EIS) and SEA, indicating confusion between the concepts and applicability of the two instruments.

Finally, it was observed that none of the proposed regulations defined available resources for implementing the SEA system (criterion i).

## 4 DISCUSSION

Until 2021, more than a dozen regulations addressing the Strategic Environmental Assessment were proposed in Brazil. However, none presented all the elements that outline a SEA system, indicating the lack of institutional maturity regarding SEA. As noted by Montaña, Malvestio and Opperman (2013), whereas a SEA regulation in Brazil has been expected for years, the institutional framework for SEA pointed to a slow evolution of SEA in the country until that moment. Almost ten years later, this paper reinforces the country's lethargy regarding incorporating SEA into its legal framework.

It is essential to highlight that even the proposed regulations did not include sufficient elements for a proper SEA regulation. In this regard, the Federal Bill nº 3729/2004, approved by the Brazilian Chamber of Deputies in 2021, stands out because it intends to be an Impact Assessment law, but SEA is not even mentioned – unlike previous versions of the same bill and bills attached to it, that addressed SEA.



It was also observed that expectations regarding the SEA objectives and application varied depending on the proposal. This diversity is not necessarily a problem and is even observed globally. As illustrated by Fischer and González (2021) and Noble and Nwanekezie (2016), different SEA types and approaches can serve different contexts. However, it is crucial to define these characteristics considering the context needs (HILDING-RYDEVIK; BJARNADÓTTIR, 2007).

Among the main gaps of the proposed SEA systems, it is possible to highlight the lack of definition of how SEA should be considered in decision-making. Supporting decision-making to ensure environmental issues' consideration is a key function of SEA (FISCHER, 2007; PARTIDÁRIO, 1996). Therefore, SEA plays a key role in contexts where planning has not been able to incorporate these issues, which is the case of Brazil (MALVESTIO; FISCHER; MONTAÑO, 2018; PIZELLA; SOUZA, 2012). However, by not defining the need for SEA to be considered in the decision-making process, there is a risk that it will not be observed. It is already the case in Brazil concerning linking other planning instruments (PORTO, M. F. A.; PORTO, R. L. L., 2008).

Another gap that stands out regards the definition of resources for implementing the SEA system. Budget constraints and the low institutional capacity of Brazilian environmental agencies has been a reality for several years (FONSECA; SÁNCHEZ; RIBEIRO, 2017). Therefore, it can be expected that the absence of resources for implementing the SEA system would be a constraint to the implementation of a structured and systematic SEA practice. Ironically, most SEAs already carried out in Brazil were motivated by financing, requested by multilateral development agencies (PELLIN *et al.*, 2011; SÁNCHEZ, 2017).

The practice of Strategic Environmental Assessment globally shows that SEA systems are diverse, varying in relation to the administrative and strategic levels to which they are applied, procedures and approaches adopted, and operationalisation mechanisms, among other characteristics (FISCHER; GONZÁLEZ, 2021; WALLINGTON; BINA; THISSEN, 2007).

Although it is possible to obtain benefits from the SEA application in non-regulated systems (RETIEF; STEENKAMP; ALBERTS, 2021; TSHIBANGU; MONTAÑO, 2019), regulation continues to be widely perceived as necessary due to the potential to contribute, for example, to the improvement of SEA practice based on explicit guidance and accumulated experience (MONTAÑO *et al.*, 2014; WIRUTSKULSHAI; SAJOR; COOWANITWONG, 2011), an adaptation of SEA principles to specific needs (MADRID; HICKEY; BOUCHARD, 2011), the definition of a solid structure to coordinate the system (KELLY; JACKSON; WILLIAMS, 2012; MALVESTIO; MONTAÑO, 2019) and ensure the integration of SEA into the planning process (RETIEF; STEENKAMP; ALBERTS, 2021).

In the case of Brazil, better structuring of the SEA system has been repeatedly suggested as a condition for improving SEA effectiveness (MALVESTIO; MONTANO, 2019; SÁNCHEZ, 2017). However, although regulation may be a way to improve SEA effectiveness, this research indicates that Brazilian legislators still do not understand this instrument well. Additionally, Brazil is living in an unfavourable context for environmental issues, which has had adverse effects on the country's environmental legislation, as illustrated by Athayde *et al.* (2022) and Fonseca and Gibson (2020).

Finally, it is noteworthy that including SEA into the legal framework in a non-articulated and incomplete way may not result in practical effects for its application, as Sánchez (2017) observed. Furthermore, the establishment of the SEA system through legislation may not be sufficient to promote the improvement of SEA practice (MONTAÑO; TSHIBANGU; MALVESTIO, 2021b) and does not guarantee that the system will be adequately implemented because the implementation is significantly influenced by the context (VICTOR; AGAMUTHU, 2014). These arguments reinforce the importance of considering the context and the experience accumulated by the country from the voluntary SEA practice to support the design of SEA regulations.

## 5 CONCLUSION

In this research, 14 proposed regulations for Strategic Environmental Assessment in Brazil were identified, including initiatives at the federal level and in four states (Bahia, Minas Gerais, Rio de Janeiro and São Paulo), the oldest being from 1994. However, from the analysis of these proposed regulations in relation to elements that characterise a SEA system, none of the proposed regulations addressed a complete system.

The definition of SEA objectives and of PPPs that would be required to be assessed were the most frequent elements addressed by the proposals. However, they express different expectations for SEA, which may be related to the specific characteristics of the context for which the instrument was proposed. On the other hand, the indication of resources, prediction of guidance mechanisms (such as guidelines), the definition of methods and the link between SEA and decision-making were the least frequent elements. These results show a context that is still not mature regarding the Strategic Environmental Assessment.

As Fischer and González (2021) highlighted, SEA is still the only socio-scientific instrument able to consider the environment as a whole and advocate for the environment as a value in planning processes strategic decisions. Therefore, it remains a globally relevant environmental policy instrument. In Brazil, SEA also remains necessary and demands the structuring of a solid system that enables a more proactive and effective practice (MONTANO; TSIBANBU; MALVESTIO, 2021a). The regulation, then, remains a critical proposal to address the existing gaps in the current SEA practice (SÁNCHEZ, 2017).

Finally, it is noteworthy that the academy has produced relevant analyses and reflections on SEA in Brazil (GALLARDO; MACHADO; KNISS, 2021), contributing to elaborating a solid regulation for SEA that suits the specificities of the Brazilian context.

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