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Advances in Implementing Strategic Environmental Assessment (SEA) Techniques in Central America and the Caribbean

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Abstract: The use of Strategic Environmental Assessment (SEA) systems is essential to ensure the sustainability of plans, programs and policies. This work shows, for the first time in the scientific literature, a joint vision of the current situation of SEA systems in Costa Rica, El Salvador, Guatemala, Panama and the Dominican Republic. The analysis has been performed using data collected from an exhaustive review of the pre-existing literature and specific information obtained from personal interviews carried out during the SEA forum held in Bogotá in 2018. Legal mechanisms in the Central American and Caribbean region reveal that specific regulation is not necessary to apply and develop SEA systems. Little experience in SEA development in the region is evidenced in the absence of SEA methodologies adapted to the different contexts of policies, plans, programs and governance circumstances. SEA results' dissemination procedures have been performed only in El Salvador and Costa Rica. Besides, results show that no monitoring mechanisms for the programs implemented under SEA processes have been applied to date. To ensure the future development of SEA processes in the region under sustainable criteria, it is essential to ensure the support of decision makers so that plans and policies can be properly adapted.

Keywords: strategic environmental assessment; legislation; development; capacities

1. Introduction

Strategic Environmental Assessment (SEA) is described as an 'assessment of the likely environmental effects of policies, plans and programmes [1]. SEA intends to shift policies, plans and programmes toward sustainable results [2], and is considered a solid support for informed decision making with a view towards sustainability [3–5]. SEA is a process designed to ensure that significant environmental effects arising from proposed plans and programmes are identified, assessed, subjected to public participation, taken into account by decision-makers and monitored. SEA set the framework for the future assessment of the development projects, some of which require Environmental Impact Assessment (EIA). SEA is therefore a set of logical steps which structure the preparation of plans and programmes. They involve building on and developing the practices that already accompany the process of planning by deepening the analysis and formalizing the results in an autonomous report [6].

Performing SEA involves answering a number of basic analytical questions: What is the nature, magnitude and evolution of the problem? What should be the objectives pursued? What are the main options for reaching these objectives? What are the likely economic, social and environmental impacts of those options? What are the advantages and disadvantages of the main options? Last but not least, how could future monitoring and evaluation be organized?

SEA analyses do not need to involve a long and detailed study in every case, but they should allow for an informed debate in all cases. Stakeholder consultation and expertise collection can run throughout the process. Consequently, the key analytical steps in impact assessment are:

1. Identify the problem;
2. Define the objectives;
3. Develop main actions;
4. Analyze their impacts;
5. Compare the options;
6. Outline monitoring and evaluation.

The role of SEA is dictated by how and where it fits into the decision-making process. SEA can fulfil two broad roles. Firstly, it can appraise the performance of plans or programmes that have already been created, or secondly, one can recognize the fact that SEA is a systematic process that can develop, assess, amend, implement, monitor and review a PPP. This distinction will depend upon the nature of the decision-making process and the communication between different actors related to both the PPP process and the SEA procedure.

Only certain plans and programmes are subject to the SEA Directive, although SEA is a useful process to aid decision-making for a plan maker whether or not it is statutorily required. However, the SEA Directive potentially has a large scope and may cover a wide range of plans and programmes. It will almost certainly cover land use plans and programmes and those produced in eight different sectors, from transport to energy to agriculture. The relationship between SEA and EIA is illustrated in Figure 1.

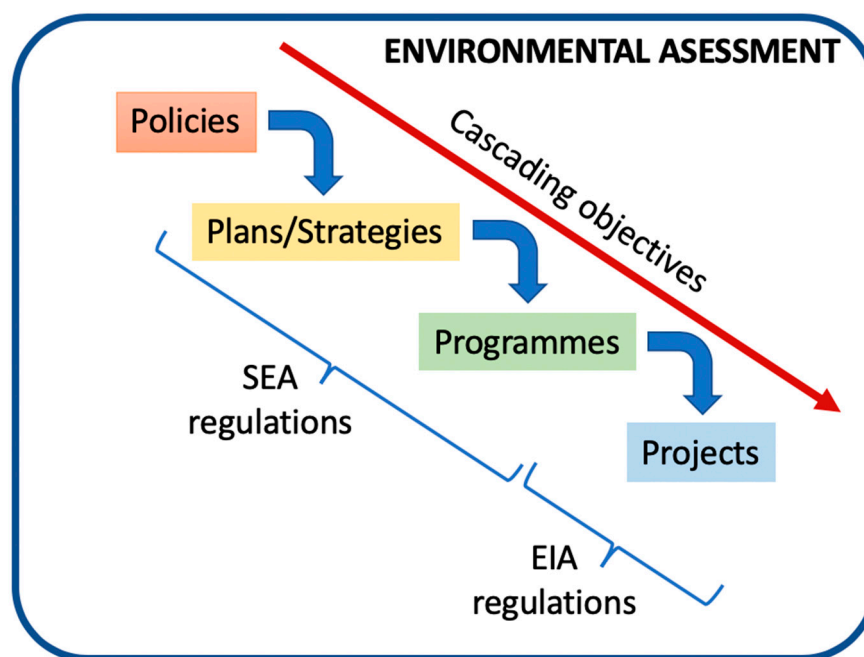


Figure 1. Relations between strategic environmental assessment (SEA) and environmental impact assessment (EIA).

Figure 1 shows the hierarchical relationship between different tiers of assessment, with higher levels of assessment informing subsequent ones. Although this is clearly a simplification of reality, the vertical relationship between assessment stages is important in SEA. Figure 1 also summarizes the legislative requirements for assessment at different stages of the process. There is no legal requirement for an SEA of high-level policies. SEA should inform subsequent assessment tiers, and to do this effectively it must take account of information needs and delivery mechanisms. SEA helps with the

preparation of EIA but does not remove the need for it. SEA provides many benefits and it ensures that a wider range of alternative options are examined at an early stage in the decision-making process, and in so doing, overcomes some of the shortcomings of project-level EIA.

According to [3], linking planning activities to the process that involves a SEA is fundamental for an environmental assessment to be successful. This interconnection marks a clear difference with the environmental impact assessment, whose processes do not need to be completely scheduled [7]. Managing a SEA along with planning tasks allows environmental criteria to be incorporated, such as impacts, risks and opportunities, in early decision-making stages [8] which, in turn, allows individual projects to be set up within a broader sustainability framework [5]. SEA supports strategic decisions to be completed with an environmental impact assessment, in which case, a more detailed analysis with a more limited scope is applied [9]. Ref. [10] considers that “the increased use of SEA is not a substitute for environmental impact assessment, but more of an up-front supplement that can ensure long-term benefits for the environment, intergenerational equity as regards natural resources, and can finally lead to sustainable development.”

2. Scope and Objectives

SEA systems have been applied since the 1980s in the Low Countries, Denmark and the UK [11]. It was at that time that the term SEA was formally introduced and became popular [12]. The SEA practice stood out in the 1990s and the first decade of the 21st century [4,12]. In 2011, there were 60 countries with an SEA system, of which only Canada and the USA corresponded to the American continent [4].

General Context of Strategic Environmental Assessment in Latin America

In Latin America, performing an SEA has been reviewed by several authors in countries like Bolivia, Brazil, Colombia, Chile, Mexico and Peru [13–16], and they revealed a marked heterogeneity in the levels of SEA-related legal and practical advances [14,16]. The diversity of the legal component among these countries varies with general laws, like those found in Bolivia, Chile and Peru. The law in Peru was amended by a Decree-Law, or by a law with a city scope application, as in Mexico for the Mexican Federal District, or laws for a specific plan, as in Colombia, which passed its “2003–2006 National Development Plan” which, in turn, was passed by Law No. 812 of 2013 [14]. However, there is either a general lack of national legal framework, or simply there is no legislative framework, as in Brazil, which possesses an application for provinces, specifically for those of Bahía, Minas Gerais and São Paulo [16,17].

The experience in Latin America shows that the existence of legal components does not guarantee that the implementation of the SEA leads to integrating sustainability criteria into the instruments evaluated, whether they are policies or plans. Such is the case of Peru and Brazil, the latter specifically in the province of São Paulo. In Peru, the developed SEAs respond to the demands of bilateral agreements between sectors and development agencies, despite having legal guidelines, this being the result of the non-mandatory preparation of SEAs, until before 2016 [16]. Ministerial resolution 175–2016 approves the criteria and mechanisms for the implementation of SEA, contemplating the mandatory nature of the SEA, the procedures and responsibilities of both the promoter and the environmental authority, and the scope levels, among other considerations [18].

In the province of São Paulo (Brazil), SEAs are executed in order to meet financing requirements. The absence of institutional and procedural frameworks limits the proper development of evaluations. This bottleneck in the advancement of the SEA results from the lack of political support to make the execution of the SEA’s mandatory [19]. The first SEA was carried out on the Rodoanel road infrastructure program [17]. The results of the authorities’ assessment were conducted with the criteria used for an EIA. This SEA was approved despite showing omissions such as the analysis of alternatives, the assessment of cumulative impacts and weaknesses in the response to the results of public participation, this being a consequence of the lack of guidelines for SEA assessment procedures [17]

and the lack of SEA competencies of the technical evaluators. The practice levels in Brazil are limited to sectoral programmes such as the one mentioned and long-term projects. Regarding experience, the literature indicates the existence of few cases of SEAs, mainly in tourism, energy and infrastructure programmes [19].

However, Chile shows substantial improvements in its SEA system. In 2010, SEAs were conceived as based on EIAs. They focused on formal aspects and the final product was based on the application of a checklist of legal aspects, while ignoring the basic concepts of an SEA. In 2015, guidance guides were promoted and they were first applied to the National Spatial Planning policy (2017). These guides establish the SEA process in stages, and they have the support of senior management, which can provide training that has transformed the existing process into a strategic thinking model [15].

The adoption of SEA processes has been marked by processes that have slowed them down in their different stages. This situation is no different for countries in Central America and the Caribbean, with irrefutable differences in the way SEAs are applied to those that exist in the aforementioned Latin American countries. From the mid-20th century, many efforts have been made in Central America to formalize environmental assessment instruments, among which the creation of the following stands out: the Organization of Central American States in 1951, the Central American Commission for the Environment and Development in 1991, the Central American Integration System in 1991 [20,21], as well as other agreements and action plans. The summary of all these actions is shown in Table 1 [20,21].

Table 1. Background of actions taken in the Central American region.

Proposers	Country	Date	Proposed Agreement
Meeting for Foreign Secretaries from Central America	El Salvador	1951	The San Salvador Charter document was signed, which gave way to the Organization of Central American States
Summit of Presidents	El Salvador	1989	The Central American Commission for the Environment and Development was created
9th Encounter of Central American presidents	Honduras	1991	The Tegucigalpa Protocol was signed, which gave way to the Central American Integration System that formally came into being in 1993.
Forum of ministers from Central America and the Caribbean	Cuba	1995	Promote environmental impact assessments in Central America and the Caribbean. This agreement was reinforced in Buenos Aires in 1996.
Permanent Environmental Committee of the Latin American Parliament (Parlatino)	-	1995	The United Nations Environment Programme prepared a model law on SEA
Presidents of Central American countries	-	1996	Regional agreement about environmental impacts on human activities. This document was not signed and no new version has appeared to date.
Ministries of the Environment and Natural Resources		2002	They signed the 'Agreement to reinforce environmental impact assessment systems in Central America'

The mission for forming the Central American Commission for the Environment and Development was to develop a regional regime of cooperation and environmental integration that contributes to improve the life quality of the populations in its Member States [22]. These Member States are grouped in the Central American Integration System, which was initially created by Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. Belize joined in 2000, as did the Dominican Republic in 2013 [23].

In 2002, the Central American Commission for the Environment and Development acknowledged that a tool with a more holistic focus than an EIA was necessary, and it contemplated two strategic large-scale assessment instruments: accumulated effects assessments and SEA. The differences between both lie in the first being used to assess regional impacts, and the second to assess policies, plans and programmes and territorial environmental ordering. The development of reference manuals for these instruments to assess impacts was also proposed [20].

Nowadays, the Central American Commission for the Environment and Development works with the 2015–2020 “Regional Environmental Framework Strategy”, whose objective is to promote a region’s environmental integration toward the socio-economic development of its people by investing efforts and empowering available resources [22].

Given the growing interest shown by regional authorities in using SEA techniques, this paper presents for the first time the joint view of the situation of SEA systems in the Central American and Caribbean countries. In the current scientific literature, information regarding the use of SEA procedures has been only identified for some South American countries, but there has been no compilation of the processes carried out by governmental institutions in the Central American and Caribbean region to date. Consequently, this paper also intends to bridge the information gap observed in the acceptance and implementation of SEA techniques used in this region. Discussion lies in the common points that appear in the success or failure of using SEAs. SEA characteristics in this region and the most relevant information gaps are herein presented. The conclusion centers on highlighting the common points, virtues and challenges of SEA systems, and the proposals made for taking necessary and immediate implementation actions in this region.

3. Materials and Methods

This research work aims to learn the details of applying SEAs to Central American and the Caribbean region. The countries to be evaluated were initially the Central American Integration System member states: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and the Dominican Republic [23]. Finally, Belize, Honduras and Nicaragua were withdrawn due to a complete lack of information.

Field data and specific information were obtained during the forum “Exchange of experiences with countries of the Central American region on Strategic Environmental Assessment (SEA)” held in Bogotá between 23rd–26th July 2018, hosted by the Ministry of the Environment and Sustainable Development of Colombia (Minambiente) and sponsored by the Presidential Cooperation Agency (APC-Colombia). The objective of this forum was to share and exchange experiences in environmental assessment matters between member countries of the Central American Commission for Environment and Development (CCAD). The forum was an exchange workshop on the Colombian experience in the appropriation of the use of Strategic Environmental Assessments, Strategic Environmental and Social Assessments and Regional Strategic Environmental Assessments, in order to obtain and disseminate new knowledge and skills within a framework of international technical cooperation and long-term mutual support.

This forum was part of the activities of the Mesoamerica Project, which promotes expanding and improving capacities and making effective the implementation of specific projects for societies in the field of infrastructure, interconnectivity and social development in Belize, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama and the Dominican Republic.

The method applied to collect the information consisted of individual consultations regarding each of the representatives of the assessed countries. This activity was carried out during the forum development. Every official of the governmental institutions represented in the forum was approached, conducting a personal interview using a common questionnaire. In addition, an extensive literature review was carried out, which confirmed the information gap on SEA systems for the countries under analysis.

Therefore, the research methodology was done following two steps: (i) fieldwork and (ii) collection of existing data. More details about these two steps are given below.

3.1. Fieldwork

Data were collected from face-to-face interviews and surveys given to government officials of the five countries of the Central American and Caribbean region. The surveys included both open and exploratory questions. The respondents were the people in charge of managing the processes related to the SEA within the ministries and/or governmental agencies. The selection of the respondents–interviewees was based on the fact that they are the ones who have complete knowledge of the functioning of the SEA systems and, therefore, are able to provide reliable information. The institutions and posts of those surveyed in each country are shown in Table 2.

Table 2. List of institutions and civil servants of the processed surveys.

Country	Institution	Post of the Surveyed Person
Costa Rica	National Technical Environmental Secretary	Head of the of the Strategic Environmental Assessment Dep.
El Salvador	Ministry of the Environment and Natural Resources	Specialist in Strategic Environmental Assessment
Guatemala	Ministry of the Environment and Natural Resources	Environmental Consultant
Panama	Ministry of the Environment	Environmental Policy Manager
Dominican Republic	Ministry of the Environment and Natural Resources	Planning Management-Environmental Regulations and Research Dep.

Surveys and interviews were held on 27th–28th July 2018 and were forwarded by email. The distributed questionnaire included eleven questions about both the legal–institutional component and the methodological component. Of the eleven questions about the methodological component, the last six of them were not answered in the majority of cases as they were related to stages of the SEA study that are yet to be implemented (e.g., analyzing alternatives, determining uncertainties, the costs of conducting SEA studies, etc.). The full set of questions included in the survey is shown in Table 3.

Table 3. SEA Survey. Full set of questions.

Legal-Institutional Component	Methodological Component
1. What is needed to implement SEA in your Ministry of Environment?	1. Has your Ministry of Environment an official methodology with which all SEAs must be governed?
2. In what types of policies, plans and programmes do you have experience applying SEA?	2. What is the name of the methodology used by your Ministry?
3. Is it mandatory under your legislation to apply the SEA to all policies, plans and programmes?	3. Indicate which types of criteria and formats are required.
4. Which criteria apply to identify which policy, plan or program require SEA?	4. Which procedures are used to evaluate SEAs from the environmental governing body perspective?
5. When a certain SEA is satisfactory for your Ministry, which type of permit or license is issued?	5. Which phase of SEA is considered to be the most important to achieve the objectives of the alternatives?
6. According to the legislation, who is in charge of carrying out the SEA: the Ministry or the owner of the plan or policy?	6. How is evaluated the environmental and sustainability contributions of each alternative with respect to the objectives?
7. Which is the internal structure of your Ministry to support the SEA elaboration process?	7. How are the selection criteria of the optimal alternative established?
8. What is the economic cost of applying a SEA?	8. Do you consider that the methods of evaluating current alternatives lead to optimal results? Why?
9. Who does the SEA Department or its equivalent inside your Ministry depend on?	9. If you had to focus the selection of alternatives, would you focus on risks or on uncertainties? Why?
10. Does the Ministry require private consultants to provide some type of certification to prepare SEAs?	10. If you needed to formulate an alternative, what basic characteristics should not be missing in this one?
11. What are those requirements or procedures to be certified consultants by the Ministry?	11. Based on the progress that the SEA has had, what point or phase or procedure do you consider to be the Achilles' heel of the SEA?

Responses were supplemented by the data collected with the documents provided by each country during the forum “Exchange of experiences with countries of the Central American region on Strategic Environmental Assessment (SEA)” aforementioned. Later, surveys were sent to civil servants to confirm the collected data.

3.2. Collection of Existing Data

Step 2 consisted of revising the state-of-the-art of the scientific papers published about SEA applications in the Central American Integration System countries. The search criterion was to search for the term “Strategic Environmental Assessment” and include the country’s name at the end. Findings were limited to: (i) the 2012 World Bank document entitled “The Strategic Environmental Assessment in the World Bank” (specifically Chapter 7, on the Latin America and the Caribbean region) and (ii) the 2018 publication by the UN Economic Commission for Latin America and the Caribbean (where Chapter IV is about the use of SEA as a strategic management instrument by 18 countries). Other documents obtained from the websites of governmental and regional institutions were also used.

The description of how the SEA systems operate in each country was made according to the following characteristics: (i) existence of legislation and regulations; (ii) performance responsibilities in the SEA system; (iii) the sectors in which developments are underway; (iv) existence of a methodology, authorizations or approval criteria of SEA studies; and (v) local professional capacities.

4. Results

Results have been obtained first in terms of the institutional and legal framework characteristics and the procedures followed by the environmental organizations in charge. Secondly, the application of the SEA is analysed in terms of their operating capacity and procedures.

4.1. Legal Framework

In the studied Central American and Caribbean region countries, environmental by-laws date back to the 1990s, except for Guatemala, whose environmental law was passed in 1986. Initially, the environmental legislation of Guatemala and Panama did not contemplate SEAs as an environmental management instrument. These legislations have been amended so they can adapt components to the international commitments that each country makes and include some aspects required by the scientific advances made in these areas.

In Costa Rica, Executive Decree No. 31849-MINAE-S-MOPT-MAG-MEIC was passed, being this the General Regulation about environmental impact assessment procedures. Point 37 (Art. 3) defines the concept of SEA management. Chapter VII (Art. 62 to 67) sets out very precise outlines about a specific operational process.

El Salvador has an organized legal framework, which denotes the maturity of the system. The legal instrument is its Environmental Law, passed on 2nd March 1998 with Decree No. 233. (Art. 5), which defines SEA as an environmental assessment instrument to be used as part of an environmental assessment system (Art. 16). Article 17 specifies the responsibilities and general actions to be taken as regards this instrument.

El Salvador also possesses specific legislation about SEA, through its General Regulation on the Natural Environment, which was published on 21st March 2000. Articles 14, 15, 16 and 17 define environmental authorities’ functions, the obligations of those featured in the document in relation with environmental assessments. Article 16 provides details of the SEA reports’ contents. Article 17 refers to the ways of presenting and passing reports. Apart from this regulation, the operational process of SEA making is addressed by the procedures included in these documents: issuing guidelines and evaluating SEA reports (EAM-EIA-PR-01) and supervising to ensure that the setout SEA recommendations are met (EAM-EAE-PR-02), both of which are dated 18th January 2017.

Among all the countries studied, Guatemala and Panama are the only ones that did not consider SEA when their legal environmental instrument was enacted. Guatemala has had an environmental

law since 28th November 1986, published under Decree 68–86. Moreover, Governmental Agreement No. 137 of 11th July 2016 publishes environmental assessment, control and follow-up (RECSA). Its Article 29 defines and depicts the responsibilities of the governing body and of those who promote the documents to be assessed. The environmental law of Panama (known as Law 41–98) dates back to 1st July 1998, and has been considered the first legislation about SEA because its Article 5 regulates the Environmental Law by means of the Executive Decree No. 4 of 1st February 2017. All this means that El Salvador is the country in the study area that has most widely integrated the SEA system into its legislation.

The environmental legislation of the Dominican Republic came into force on 18th August 2000 with the General Environmental Law (64–00). Article 16 point 27 defines the concept of SEA as an instrument in the environmental assessment process according to Article 38. Article 39 confers this law to be of specific application, and also assigns the respective operational responsibilities to carry out the operational process. Article 39 also regulates the creation of SEA guidelines to perform the SEA process. A draft has been available since November 2018, but it is still pending.

Details of the legal instruments and articles that promote the application of SEA techniques in each country are shown in Table 4.

Table 4. Environmental laws and regulations.

Country	Legal Instrument	Date	SEA Articles	Regulation
Costa Rica	Executive Decree 31849-MINAE-S-MOPT-MAG-MEIC	28th June 2004	Art. 3.37 Arts 62–70	General Regulation on environmental impact assessment procedures
El Salvador	Environmental Law (Decree No. 233)	2nd March 1998	Art. 17	General Regulation of Environmental Law 21st March 2000. Art. 14, 15, 16, 17.
Guatemala	Law on protecting and improving the natural environment, Decree No. 68–86	28th Nov 1986	It does not include SEA	Regulation on the evaluation, control and environmental follow-up (RECSA). Governmental agreement No. 137-2016, 11th July 2016. Art. 29
Panama	General Environmental Law. Law 41–98	1st July 1998	SEA not included in legislation (1)	
Dominican Republic	General Environmental Law. Law 64–00	18th Aug 2000	Art. 16.27, 16.38–39	Guidelines being reviewed

Note: This assessment is considered in Executive Decree No. 4 of 1st February 2017, which regulates Art. 5 of the Environmental Law.

All these environmental laws, as part of the execution and responsibility mandates of the SEA, as well as the authorizations that the governing environmental organization must issue after revising the SEA documentation, present high heterogeneity. Performing SEA is considered compulsory in El Salvador and the Dominican Republic, while Costa Rica expects SEA to be only applied to territorial planning, as regulated by Decree 32967, which supplements the aforementioned Decree 31849. Unlike the aforementioned countries, this Decree is voluntary in Panama. In Guatemala, the mandatory nature of the process is not indicated.

The legislations of El Salvador, Panama, Guatemala and the Dominican Republic explicitly indicate that the responsibility for making SEAs is assigned to those featured in the instrument to be evaluated. This fact is not explicitly indicated in the legislation of Costa Rica.

Table 5 summarizes these legal and institutional components.

Table 5. Summary of legal/institutional components.

Integration of SEA in the Legislation	
Costa Rica	Executive Decree No. 31849-MINAE-S-MOPT-MAG-MEIC. SEA matters appear in Art. 3, point 37 and in Chapter 7 (Art. 62–70). However, from the practical point of view, only one exercise known as SEA is regulated for territorial planning, with no regulation in force to apply policies, plans and programmes.
El Salvador	Art. 17 of the Environmental Law, and in Arts. 14, 15, 16 and 17 of the General Regulation of the Environmental Law
Guatemala	Law on protecting and improving the natural environment, Decree No. 68–86. SEA is considered in the Regulation on the assessment, control and environmental follow-up (RECSA). Governmental agreement No. 137-2016, dated 11th July 2016. Art. 29.
Panama	Law 41 of 1st July 1998 (General Environmental Law, Rep. of Panama) “It includes the reforms passed by laws: 18 of 2003; 44 of 2006; 65 of 2010 and 8 of 2015. Thus, SEA is established as an environmental management instrument in the Rep. of Panama in Title II, Chap. 1, Art. 5.
Dominican Rep.	Yes, in Law 64–00 and its articles 16, 38 and 39.
Existence of Regulations and/or Guidelines	
Costa Rica	They do not exist
El Salvador	There possess guidelines
Guatemala	Only RECSA, but no guidelines exist
Panama	Regulation on the Environmental Impact Assessment process (in 2009), which includes: “Title XII: Strategic Environmental Assessment of Plans and Programmes”.
Dominican Rep.	A draft of guidelines exists, but has not yet been published
Compulsory Nature of SEA	
Costa Rica	Only for territorial planning
El Salvador	Compulsory
Guatemala	Not indicated
Panama	Voluntary
Dominican Rep.	Compulsory
Responsibility of Executing SEA	
Costa Rica	Not defined
El Salvador	The person/organization featured on the instrument to be assessed
Guatemala	The person/organization featured on the instrument to be assessed
Panama	The person/organization featured on the instrument to be assessed
Dominican Rep.	The person/organization featured on the instrument to be assessed
Permits Issued after Assessing the Document	
Costa Rica	Not defined
El Salvador	Resolution is issued to pass the report
Guatemala	Not defined
Panama	No license type is issued
Dominican Rep.	Not defined
Governing Organizations’ Structure to Support SEA	
Costa Rica	It does not exist
El Salvador	Assessment Management
Guatemala	It does not exist
Panama	Planning Management
Dominican Rep.	It does not exist

4.2. Operating Capacity/Procedures

Despite the little experience acquired in making SEAs, the conducted survey identified how the hierarchical structures of the studied countries share one common element: they place the technical support units in SEA close to decision makers. Costa Rica, El Salvador and Panama have an administrative/technical structure in charge of processing SEAs. Costa Rica and El Salvador conceive

them as assessment guidelines, while Panama's management of the operating capacity of processes is based on planning. Guatemala and the Dominican Republic do not currently possess an organic structure for SEAs. However, when the Dominican Republic environmental law came into force, namely Law 64–00, its first flow chart included a SEA department in its environmental assessment management department, which was in operation until 2004.

In those countries with active operational units, these units are in charge of issuing the reference terms that act as a guide to making SEAs. In El Salvador, the assessment management department issues the guidelines that adapt to the policies, plans and programme type. The methodology is only expected to be based on environmental sustainability mechanisms. These same requirements apply in Costa Rica. Meanwhile, Guatemala, Panama and the Dominican Republic do not possess any methodological outlines to be applied.

According to the survey results, a total number of 163 SEAs studies have been performed in Central American countries to date. The experiences in the studied countries focus on the following sectors: energy, metal mining and two more studies related with health and infrastructure sectors in El Salvador (five SEAs in total); the expected territorial planning in legal terms for Costa Rica, with a total number of 153 SEAs; protected areas and those with wildlife for Panama, with a total number of three SEAs; energy for the Dominican Republic, as well as an SEA document in the sanitation sector, devised according to the principles rooted in an environmental impact assessment, with a total number of two SEAs. No sectors are indicated for performing SEAs in Guatemala, although the literature review reflects that a project pilot was carried out in 1997 called "Private participation in infrastructure" [24]. Figures 2 and 3 shows the distribution of SEAs by countries and productive sectors.

When surveying civil servants about how policies, plans and programmes are selected so an SEA is applied to them, collected data indicate that in Panama, "possession criteria are applied to some type of natural resource that has been made a priority or is important in national life". According to legal terms, Costa Rica applies the SEA methodology only to territorial planning, while the remaining countries have not set criteria to define which instruments must be assessed by strategic environmental techniques.

Very poor operational development was found regarding the conditions to issue final licenses or grants. After evaluating the SEA document, only Costa Rica and El Salvador have issued a resolution to pass reports. None of the other countries have established conditions to deliver such a permit or defined documents that back the SEAs that have been performed, even by the environmental authorities themselves.

Regarding the existence of local technical capacity, we must record that, although some legislation systems have considered drawing up lists of certified consultants in SEA matters, none of the studied countries has an authorized list of local consultants for performing SEA tasks, nor was any evidence found for a follow-up process for some of the SEAs made.

Table 6 summarizes the operational capacity and procedures component.

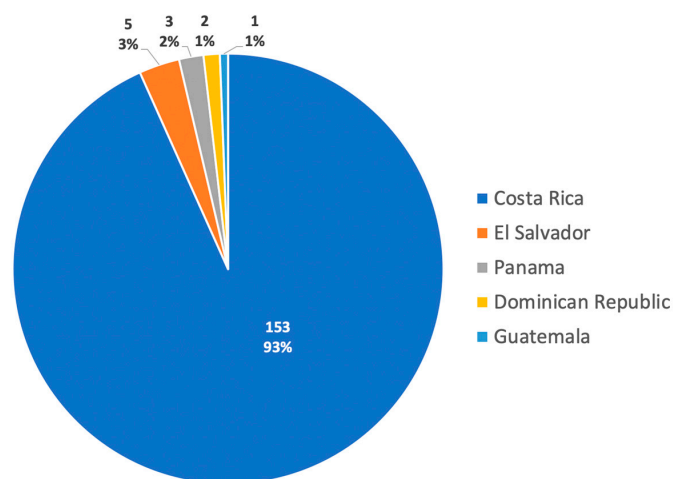


Figure 2. Number of SEA analysis on each Central American country.

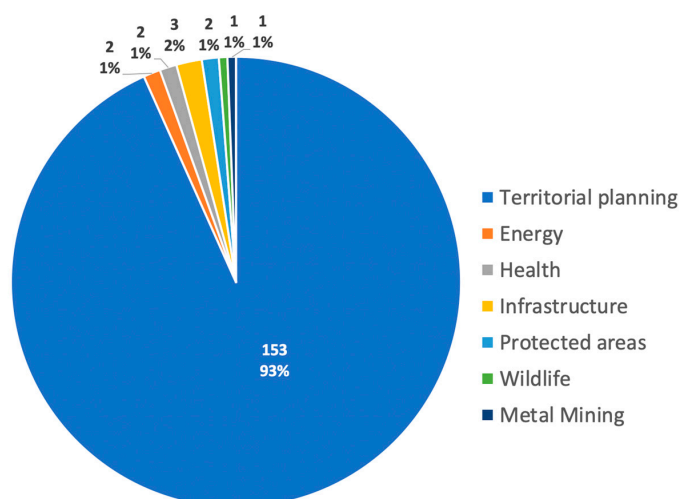


Figure 3. Distribution of SEAs analysis by productive sectors.

Table 6. Summary of the operational capacity/procedures component.

Type of Projects Undertaken	
Costa Rica	National Technical Environmental Secretary has no SEA registered for policies, plans and programmes. There are registers of 153 cases of territorial planning that have conducted environmental studies according to SEA principles, of which 90% are regulatory plans.
El Salvador	Biofuel policy, energy policy, metal mining sector, development strategy in marine coastal strips.
Guatemala	No projects have been undertaken.
Panama	Instruments related to Protected Areas and Wildlife
Dominican Rep.	National Energy Plan. An SEA also exists for the sanitation sector with methodologies rooted in environmental impact assessments.
Instruments Determined that Required SEA	
Costa Rica	Only territorial planning, as set out in legislative terms.
El Salvador	Not determined
Guatemala	Not determined
Panama	Criteria of belonging applied to some type of natural resource that is a priority or is important in national life.
Dominican Rep.	Not determined
Expected or Proposed Methodology	
Costa Rica	It does not exist
El Salvador	Suitable guidelines for policies, plans and programmes are issued and an environmental sustainability-based methodology is requested.
Guatemala	It does not exist
Panama	It does not exist
Dominican Rep.	It does not exist
Certified Consultants by a Government Environmental Organization	
Costa Rica	No SEA outlines exist. No list of certified consultants exists.
El Salvador	No SEA outlines exist. No list of certified consultants exists.
Guatemala	No such list exists, despite being included in environmental assessment, control and follow-up (RECSA).
Panama	No such list exists, although work is being doing on these requirements.
Dominican Rep.	Neither legally expected outlines, nor lists of certified consultants for strategic assessments exist.

5. Discussion

The work carried out reveals that SEA systems and their development are clearly evidenced in the studied countries. Despite the heterogeneity of the extent of advances made in the region, the characteristics of these SEA systems can be summarized by the following three main aspects:

1. Importance attached to the legal component. One of the distinctive features of the SEA experience is that each country has generated its own instruments [25]. Currently, all the evaluated legal frameworks include the SEA figure, and they clearly define the SEA concept, which is considered as an instrument of environmental application. Sometimes, they even define who is in charge of leading the SEA study. To put an SEA system into practice, these specifications are beneficial because the meaning of SEA is potentially very broad and, unless it is limited by legislation, a regulation or some form of mutual agreement, its purpose and scope can be easily misinterpreted [17]. The legal mechanisms in the region reveal that a legal mandate or regulation is not necessary to apply and develop a SEA system. This is especially true in those countries where these assessments are considered as compulsory, for which a large gap in the progress made in SEA matters has been identified. According to the World Bank, if there is no legal basis, there is no incentive to use public resources when applying an SEA [24]. Nonetheless, the analysis of data collected in this study allows us to disagree, as data evidences that the decision makers' willingness is the essential driver for an SEA system to be set up. Ref. [26] refers to decision makers and politicians as "the groups that decide whether the SEA must be set up or not". As an example, it has been seen that in Panama, SEA development is voluntary, although several performed SEAs exist. Conversely, SEA is compulsory in the Dominican Republic, yet only one SEA has been performed in the 19 years that environmental legislation, including SEAs, exists. El Salvador has a functional and operational evaluation system with a strategic vision, due to the one-and-a-half-year training received and sponsored by decision makers, a fact that makes a difference compared to the other countries of the region. Therefore, if decision makers are not receptive to other (environmental) values while making decisions, the use and influence of SEA will diminish [27], and SEA will be used only to bridge implementation gaps [28]. In this sense, it is necessary to promote knowledge of SEA among decision-makers, with the aim that their capacity or interest increases, therefore making the progress of SEA consistent with their legal requirements;
2. No specified methodologies. The fact that little experience has been acquired in the region has not allowed methodologies that adapt to the different contexts of policies, plans and programmes and governance circumstances of development. Only El Salvador and Costa Rica have promoted methodological outlines based on sustainability criteria. Methodological guidelines in El Salvador contain indications about SEA report contents by referring to those applied in Europe;
3. Gaps in the final response mechanisms of governing organizations and follow-up organizations, as well as limited local technical capacities. Once the components used to perform SEA studies have been seen, the effect of local experience clearly comes over. Except for El Salvador and Costa Rica, the answers given by the governmental institutions in charge of evaluating SEA studies indicate that procedures are lacking to communicate the results of the revisions made. It has not been possible to identify the follow-up mechanisms used in the evaluated countries, and the continuity stage and effect of SEA on the projects that depend on policies, plans and programmes proved futile. When these procedures are applied, SEA evaluation can be done, but the impact that SEA has on executed programmes is not being assessed [29] because the application of the strategic assessment results are not being followed up. No official list of local SEA professionals exists, despite the legislation specifies a requirement to draw up these lists; that is, despite possessing lists for EIA specialists, these lists are missing for SEA. In some Latin American countries, international experience has been sought to bridge this gap until local capacities have been generated.

- (1) The experience in Latin America shows that the existence of legal components does not guarantee that SEA implementation leads to integrating sustainability criteria into the instruments evaluated, whether they are policies or plans. This is evident in the operation of the SEA management systems in Chile and El Salvador. They both share a common characteristic which has been responsible for the successful advancement of these systems. Both Chile and El Salvador have received support from decision makers and this has translated into an increase in the response capacity of their SEA management systems. These two countries have specific legislation about SEA. However, the implementation of SEA systems was only possible when the decision makers understood the importance of applying SEA to ensure development under sustainability criteria as a real matter of concern. Both Chile and El Salvador are examples of the positive impact of having the support of decision makers to advance the implementation of SEA systems. To illustrate an opposite case, we cite the situation in the Dominican Republic, where SEA has existed as an environmental assessment instrument since the legislation was enacted. However, the lack of support from senior management has hampered the progress of the management system, being, at present, still at its early stages;
- (2) The SEA systems of Chile and El Salvador have distinctive features with respect to countries that have legislation and carried out SEA studies, but without obtaining results from sustainable strategies. These peculiar features were acquired by Chile and El Salvador after the support of the decision makers. They can be summarized as follows:
 - (a) Training: civil servants received SEA training, which allowed obtaining a system based on strategic thinking and not for the sole purpose of simple legal compliance
 - (b) Regulation: Formation of guidelines and orientation guidelines in which they have developed in detail the stages of the SEA process;
 - (c) Disclosure of concepts: Knowledge of SEA concepts and the legal responsibilities of proponents of SEA studies;
- (3) The SEA management system of the province of São Paulo in Brazil is a benchmark of the results that a management system produces when it lacks training, regulation and knowledge of SEA concepts. Finally, the consequences of the lack of a strategic scheme have great impact on projects derived from SEA-free plans and policies developed without sustainability criteria, and on environmental impact assessments performed only under general legal requirements.

6. Conclusions

For the first time, this paper presents an up-to-date overview of the advances made in Central America and the Caribbean region in the application of SEA techniques. As the existing literature does not include detailed information on each of the SEA systems in these countries, this work allows, finally, to acquire precise and detailed information obtained from the governments of the current SEA development in the Central American and Caribbean countries. In addition to the originality of the information presented, it should be noted that this work includes a detailed scrutiny, which makes it a useful tool for decision-making by regional authorities, who have shown increasing interest in the implementation of SEAs for their region.

The diagnosis made sheds light on the necessary points to work on in all the countries of the region, which will improve SEA systems and, at the same time, minimize the information gap existing in the SEA management of the region.

Results shown in this work reveal a region where SEA practical evaluation and necessary follow-up mechanisms have not been set up yet. However, keen interest has been shown in possessing legislation in SEA matters, a strong starting point, as it is much easier to lead decision makers to promote these assessments if they are legally required. This fact indicates that SEA analyses are executed thanks only

to decision maker's willingness. This strong point was evidenced in all the countries of the study area. However, the state of SEA application in each one of the five studied countries of the Central American and Caribbean region is different:

- El Salvador is the one that has most widely integrated SEA into its legislation and made it operational. The country has conceived and structured its SEA management system based on strategic thinking, which allows SEA's results to integrate sustainability criteria;
- Panama needs to invest efforts to extend regulations that offer details of operational SEA functioning, because it lacks specific guidelines to run SEA processes. It still requires promoting the importance of SEA tools under sustainable development criteria at high decision-making levels, and thus being able to receive support to develop the whole SEA system;
- The position of Costa Rica is still very basic as it limits the sectors for which SEAs are applied to those considered by the 2002 Central American Commission for the Environment and Development recommendations that indicate the application of SEAs to territorial planning matters. Although Costa Rica is the country in the Central American and Caribbean region with the most SEA reports executed, they are all of a general nature, supported by its legislation and limited to a single productive sector. These implementation characteristics, plus the absence of regulations that define the SEA's scope and training based on sustainability criteria, do not place Costa Rica as the country in the region with the highest development of SEA management. The progress level of the SEA management system should not be measured by the number of SEA reports made, but by the results provided by them in the context of sustainability. A similar experience in Latin America has been found in Chile. Between 2010–2015, Chile performed 300 SEAs. However, they did not present progress with the results obtained until incorporating strategic thinking into their SEA management system;
- Guatemala and the Dominican Republic need to consolidate both their legal and operational components, which are currently almost nonexistent. These two countries have the least experience and progress in the implementation of SEA systems in the Central American and Caribbean region. The Dominican Republic and Guatemala have in common the lack of support from decision-makers due to their ignorance of the importance of the SEA process. Under this scope, the performance of SEAs is motivated by simple legal compliance.

In the region, the main obstacle for the development of SEA systems is the lack of knowledge of decision-makers in the application of SEA techniques. When overcoming this difficulty, the performance of SEA systems will be greatly improved, also accounting for sufficient technical conditions to achieve sustainable results. Those systems should integrate strategic thinking views which allow integrating sustainability criteria while also adapting SEA to the planning processes.

It is important to highlight one common aspect that has been found for all the countries except for El Salvador: in the region, there is no methodology which allows providing comprehensible and achievable alternatives and there is a lack of techniques to ensure that the most suitable alternative for regional contexts is selected. The existence of these techniques will facilitate the development of achievable strategic measures in each country in the region.

SEA systems evolve with time, as do regional variations, and all these changes are influenced by social, economic and technological contexts [30]. The Central American Commission for the Environment and Development has considered, since 2002, an accurate route to be followed by SEAs, which evidently focuses on the environmental assessment criteria established at that time. Nowadays, SEA appears to be better-established after almost two decades of research and work experience. The main weaknesses of the aforementioned strategic management systems indicate that an immediate set of actions is required for the whole region:

1. Incorporate guidelines establishing SEA processes or stages;
2. Draft technical guidance documents allowing the implementation of the guidelines;
3. Raise levels of awareness and understanding in decision makers;

4. Identify the institutional changes required in each country to guarantee the success of SEA implementation;
5. Add to the legal framework of each country the necessary requirement to synchronize SEA with planning;
6. Create regional agreements for the dissemination and exchange of experiences. These may consist of sharing practical experience through forums or regional meetings;
7. Develop good practice guides adapted to the actual conditions of the region;
8. Develop SEA methodologies adapted to the realities of the region. These methodologies must include an analysis of alternatives and consider simple criteria for selecting the most viable alternative;
9. Create an inter-institutional disclosure mechanism, whose objective is to establish a gear between all the actors involved. This measure will increase the awareness and responsibility of each institution while complying with SEA legislation;
10. Development of SEA capabilities. These should consider the participation of decision makers, officials both from the governing body and from other governmental institutions, and consultants;
11. Establish profiles of the technical teams that will develop SEAs, defining competencies and previous experience;
12. Generate a list of SEA consultants for the region;
13. Establish quality control indicators for SEA documents;
14. Carry out internal and external audits of the management system, whose main objective is verifying the performance levels in each country. Regional authorities are responsible for external audits;
15. Propose regional environmental goals regarding SEA. The goals finally established must correspond to the reality of each country, both socially, economically and at the level of implementation of the SEA management system;
16. Propose a follow-up mechanism to the established regional goals.

Putting into practice these actions will reinforce the cross-sectional axis of “A regional system for environmental systems” [22], allowing the region to establish norms for the operational levels of the SEA system based on these indicators while narrowing or even closing gaps in the region’s strategic management system.

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