

Strategic Environmental Assessment: An Overview of the European Experiences



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Abstract Since the last decades Strategic Environmental Assessment (SEA) has been recognized as a very important and rapidly growing area of research and application in the domain of sustainable development and spatial planning. The objective of this chapter is to provide an overview of the SEA, exploring its implementation across the different European countries and focusing on the different sectors of application. Starting from a deep state-of-the-art review, the article also highlights open questions and research needs, which allow to identify possible future recommendations.

Keywords Decision-making · Evaluation · Sustainability · Projects/plans/programmes

1 Introduction

Strategic Environmental Assessment (SEA) is a policy instrument which has been developed since the '80s as a means to influence strategic decision-making in policies, plans or programs of public bodies or responsible authorities (Partidario 2000).

More formally, SEA can be defined as a systemic process designed to assess the environmental consequences of policies, plans and programs (PPPs), in order to ensure that these consequences are included to all intents and adequately addressed from the early stages of the decision-making process, to the same level of economic and social considerations (Bottero et al. 2014; Ferretti 2012). There are many other definitions of SEA (Noble and Nwanekezie 2017) but they are all variant on this theme and they are based on the same basic principles that can be summarized as follows (Therivel 2004):

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1. SEA is a tool for improving the strategic action;
2. SEA should promote participation of all the stakeholders;
3. SEA should focus on key environmental and sustainability constrains;
4. SEA should help in identifying the best option among a set of alternative solutions;
5. SEA aims at minimizing negative impacts, optimizing positive ones and compensating for the loss of valuable features and elements;
6. SEA should ensure that actions under examination do not cause irreversible impacts and damages.

The SEA procedure has been introduced in the Member States of European Union by the European Directive 2001/42/CE, on the assessment of the effects of certain plans and programs on the environment (European Commission 2001). The SEA Directive was conceived with the intention of incorporating more regard to sustainability principles into public plans and programmes across a wide range of sectors, such as transport, energy, regional development, spatial use, and so on. Indeed, its aim is to encourage the development of better plans, considering and evaluating long-term effects and wider impacts on the environment, also combining the benefits with an informed decision-making process that enables to guarantee a greater public understanding and acceptance (Nilsson and Dalkmann 2001).

Actually, after sever applications in the different Member States and many different studies, SEA is considered as a means of control of the sustainability of all the programmed actions, as a moment of comparison between objectives that may conflict with the environmental ones, and as an instrument of participation and transparency, to support an informed decision-making process.

Starting from a review of the practical experiences of SEA in the European context, this article reflects on the current state of the procedure, focusing on the main applications and the related effectiveness and exploring future possible perspectives (Fundingsland Tetlow and Hanusch 2012; Stoeglehner and Wegerer 2006; Wegerer and Stoeglehner 2004).

2 The SEA Directive

2.1 Principles and Phases of the Evaluation

The European Directive 42/2001 on the assessment of the effects of certain plans and programmes on the environment went into force in June 27th 2001, as a result of a long scientific, cultural and institutional journey. The Directive, which is composed by 20 recitals, 15 articles and two annexes, sets out the objective, the general process and the protocol and clarifies the framework that the Member States should carrying out for implementing SEA in the legal norms, whether in a separate SEA-law, or integrating it in existing laws and planning procedures.

According to the Directive, SEA develops itself in subsequent steps that consider: Screening (Is SEA necessary for the PPP under investigation?), Scoping (What are the environmental objectives of PPP? Which issues should be discussed in the assessment? Which assessment method is feasible with the available data?), Environmental Assessment (How significant are the impacts? How can these be reduced if necessary? How should these be monitored after decision-making?), Review (Is the report user-friendly and unbiased? Are all the relevant issues, including alternatives, discussed? Are the forecasts and the associated methods presented clearly?), Implementation and Monitoring (Is it clear how the transport infrastructure plan is to be implemented? Are proposals for monitoring set down clearly? Is there a mechanism for correcting any unacceptable aspects of implementation?), Consultation and Participation (Is there any plan for public participation? Is there a procedure to interact with the authorities of another country in case of transboundary corridor?), Decision (Is the SEA integrated into the planning process? Is the SEA linked with other types of assessment? Is the SEA fully considered in decision-making?) (Vincente and Partidario 2006).

Figure 1 gives a schematic representation of the overall SEA process, highlighting the participatory and integrative approach advocated by the procedure.

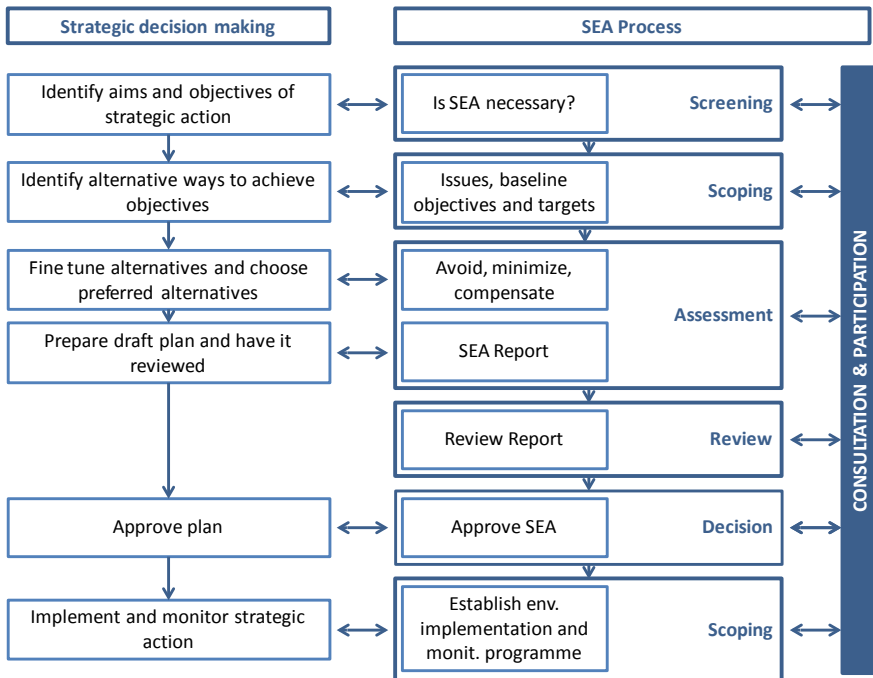


Fig. 1 Representation of the SEA process as defined by the EU Directive 42/2001

2.2 *Implementation of the Directive*

Since its adoption, the implementation of the SEA Directive has required Member States to re-think traditional approaches to planning, strengthening the consideration of long term sustainable development in planning procedures. As far as its implementation is considered, it is possible to recall the SEA Directive was received in different way by the Member States, so legislative framework varies between them, depending on their administrative structure. Table 1 reports an overview of national legislation in the domain of SEA in the European context. As it possible to see, the majority of the Member States have introduced the SEA legislation into their existing arrangements, e.g. Environmental Code or other legal acts; a number of Member States have also implemented several amendments to existing sectoral legislation, with specific reference to spatial planning procedures.

3 SEA state of play

As already seen, there is no universal approach to SEA and the Member States consider specific legislation frameworks and guide lines. However, it seems to be interesting to compare the situation in the different countries in order to provide a complete picture of the situation across Europe.

According to the information gathered by a review of different studies and European documents (European Commission 2016; Weilinad 2010; Dusik and Sadler 2004), it is possible to define the average number of concluded SEA procedures carried out each year, for the period 2007–2014. The number of SEAs performed per year has a wide range of variation, that goes from 2 procedures per year in Malta to 3000 procedures per year in Germany (Fig. 2). This variance strictly depends on the size of the State and also on its SEA implementation and legislative framework. Despite these large differences, it is possible to observe that small Member States carry out few SEAs per year, as in the case of Luxembourg with 15 SEAs for year. It is also worthy notice that Belgium has only 9 SEAs per year, which could reflect the national government's lack of competences in this field. With particular reference to the Italian situation, the information collected in a specific study carried on by the European Commission (2016) highlights that the number of completed SEAs in the period 2009–2013 is 600 on average per year with 1000 screening procedures per year.

As far as the sectors of application are concerned, Fig. 3 summarizes the general level of diffusion of SEA across the different countries. As it is possible to see, the domain of spatial planning, including town and country plans, covers the majority of SEA completed applications. Also water plans play an important role in the existing applications, followed by transport and energy plans.

Other interesting findings emerge from the overall analysis of the SEA procedures in Europe in the same period are reported in Fig. 4. Examining this graph

Table 1 Type of national legislation transposing the SEA Directive

Integrated legislation				
	Specific SEA legislation	Environnemental code/Environnemental Protection Act	EIA legislation	Sectoral legislation
Austria	X ^a			X ^b
Belgium Federal	X			
Belgium—Flanders Region	X		X	X
Belgium—Brussels Capital Region	X			X
Belgium—Wallonia Region		X		X
Bulgaria	X	X		
Croatia	X	X		
Cyprus	X			
Czech Republic			X	X
Denmark	X			
Estonia			X	X
Finland	X			X
France		X		
Germany	X		X	X
Greece	X			
Hungary	X	X		
Ireland	X			X
Italy	X	X ^c	X ^d	
Latvia	X		X	
Lithuania	X			X
Luxembourg	X			X
Malta	X			
Netherlands		X	X	X
Poland		X	X	X
Portugal	X			
Romania	X			
Slovakia			X	
Slovenia		X		
Spain	X		X	
Sweden		X	X	
UK	X			X

^aSome Provinces

^bFederal level and some Provinces

^cSEA/EIA at National/Regional level

^dSome Regions

Source elaboration from European Commission (2016)

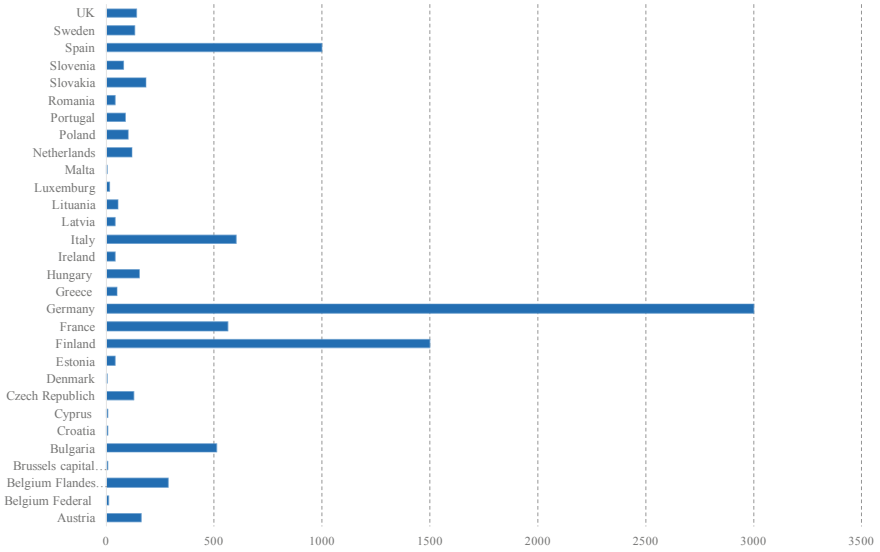


Fig. 2 Average number of SEA procedure carried out each year 2007–2014 (Source Elaboration from European Commission 2016)

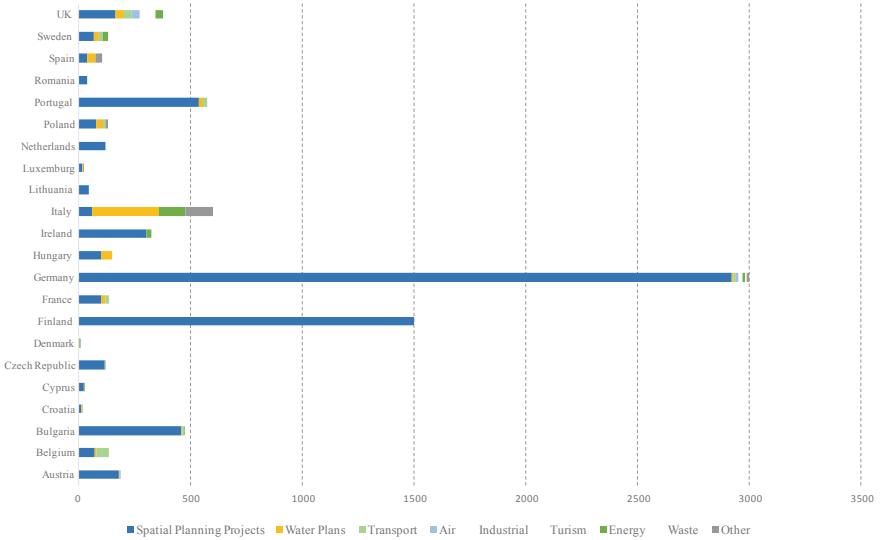


Fig. 3 Most common types of plan and programs considered in the SEA procedures in the period 2007–2013 across the different European countries (Source Elaboration from European Commission 2016)

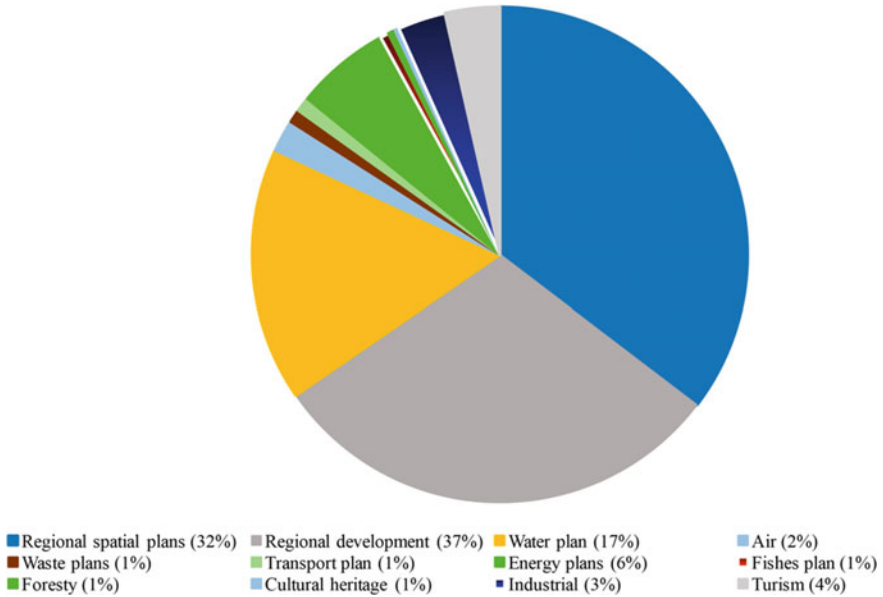


Fig. 4 Distribution of the SEAs procedures in the different sectors of application in Europe in the period 2007–2013 (Source Elaboration from European Commission 2016)

it is confirmed that the areas of prevailing applications are those related to spatial planning projects, even if other categories are important such as forestry, cultural heritage, industrial activities and tourism. As far as these categories are considered, it is important to define that Italy, despite being a small country, is one of the major countries that is experimenting the SEA in these minor areas of application, undertaking around the 20% of the total SEAs procedures in the cultural heritage and tourism domain.

4 Discussion and Conclusions

After having explored the SEA applications in the European context, it is interesting to reflect about its effectiveness and performance. This is a very complex task because the SEA success strictly depends on the context where it is applied and from the specific legislation adopted by each country. In this sense, many scholars and researchers have made an attempt of measuring SEA effectiveness using rigorous analytical tools (van Doren et al. 2012; Sheate and Eales 2016; Partidario and Fisher 2004; Fischer 2007). Generally speaking, these studies distinguish three main components of the concept, that can be described as follows:

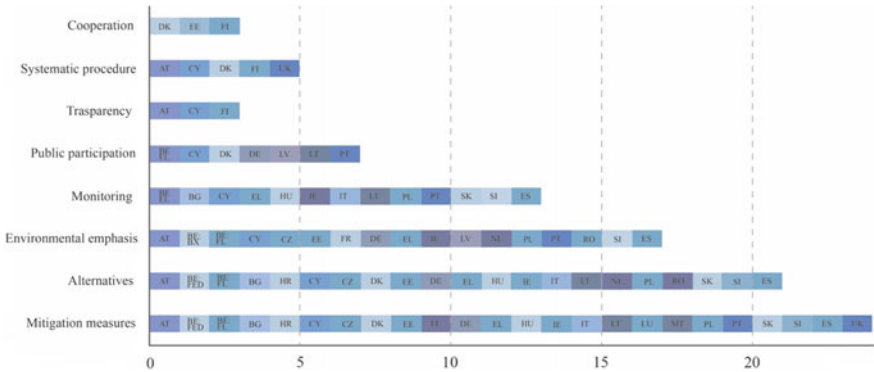


Fig. 5 Perceived influence of SEA applications in planning processes (Source Elaboration from European Commission 2016)

- substantive effectiveness, which allows to understand if SEA achieves its purpose and is able to inform the decision-making process;
- procedural effectiveness, which looks at whether SEA follows the legal requirements;
- transformative effectiveness, that takes into account more intangible benefits, such as the creation of social learning processes and knowledge exchanges.

In a recent survey carried on by the European Commission (2016), a questionnaire was submitted to the representatives of the different Member States in order to collect information about the results of SEA implementation. As far as the SEA influence on planning processes is concerned, the study highlights that the most significant consequences are related to the increase of the environmental emphasis at the preliminary phases of the process, to the consideration of a number of alternatives and to inclusion of mitigation measures (Fig. 5).

These findings are also confirmed by the relevant literature in the domain of SEA where the most relevant benefits are connected to the following elements (Marsden and De Mulder 2005; Sadler and Verheem 1996; Jones 2005; Theophilou et al. 2010):

- SEA allows for a solid decision-making process, allowing transparency in the procedure, supporting the participation of the stakeholders and anticipating threats and negative impacts;
- SEA permits to create and develop a credible alternative as a result of its ability to lead and shape projects;
- SEA ensure strategic thinking, appraising actions and scenarios since the very early stages of the decision process.

However, different authors put in evidence also limits of SEA, focusing on the insufficient attention devoted to monitoring activities in the completed procedures which lack in the use of specific indicators and indexes able to measure the real effectiveness of the considered plans. Another weakness is related to the difficulties in the

Table 2 SWOT analysis resulting from the SEA state-of-the-art-review

Strengths	Weaknesses
<ul style="list-style-type: none"> • SEA increasingly leads to changes in PPP contents • SEA is becoming more integrated into planning processes • Raising awareness around environmental implications of decisions • Leading to more transparent processes • Widespread application • Contributing to capacity building 	<ul style="list-style-type: none"> • Capacity of SEA to exert limited influence • Long-standing shortcomings related to SEA process limitations
Opportunities	Threats
<ul style="list-style-type: none"> • Better integration with decision-making • Facing global challenges: considering environmental limits, ecosystems services and climate change issues • Strategic SEA supporting good governance 	<ul style="list-style-type: none"> • Unclear role and aim of SEA • Overload of SEA expectations • Recession causing limited resources available for SEA

Source Elaboration from Fundingsland Tetlow and Hanusch (2012)

correct definition of compensatory measures for balancing the negative environmental impacts of the plans. In this sense, a very promising innovation is related to the introduction of ecosystems services within the SEA practice that could support the quantitative evaluation of the alteration of the environmental system. A final drawback emerging from the analysis of SEA reports and scientific documents is related to the poor culture of the practitioners in the field of environmental assessment who tend to perceive SEA as an exercise to meet legislative requirements, rather than a process which adds real value to the planning process.

In line with the aforementioned considerations, Fundingsland Tetlow and Hanusch (2012) summarise the main strengths, weaknesses, opportunities and threats reflected during the state-of-the-art review of the SEA procedure (Table 2).

In conclusion it is possible to say that even if SEA is still evolving and has not yet reach its full potential, nevertheless there are important arguments supporting its positive role in raising awareness of the environmental implications of strategic decisions (Mondini 2016, 2019).

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