Environmental Impact Assessment Review 73 (2018) 60–69

Contents lists available at ScienceDirect

Environmental Impact Assessment Review

journal homepage: www.elsevier.com/locate/eiar

Investigating the substantive effectiveness of Strategic Environmental Assessment of urban planning: Evidence from Italy and Spain☆

Carlo Rega[a,*,1], Juan P. Singer[b], Davide Geneletti[c]

[a] ITERAS – Research Centre for Sustainability and Territorial Innovation, Via C. Colombo, Bari 70126, Italy
[b] GMS International, Carrer Cuba 7, Local | 08030 Barcelona |, Spain
[c] Planning and Design for Sustainable Places Lab – DICAM, University of Trento, Italy

ARTICLE INFO

Keywords:
Urban planning
Strategic Environmental Assessment
Effectiveness
Legal frameworks
SEA authority

ABSTRACT

We investigated the substantive effectiveness of Strategic Environmental Assessment (SEA) of urban planning in Italy and Spain, by looking at the changes made to the original plan as a result of the SEA process. The Italian and Spanish SEA legislations establish an SEA Authority, different from the one that elaborates the plan and the Environmental Report. This authority is in charge of supervising the SEA process and issuing a final statement containing directions and prescriptions on environmental issues to be implemented in the plan as a prerequisite for its approval. After having reviewed a sample of SEA in these two countries, we found that in the great majority of cases the SEA authority required some changes, despite the fact that the plans had undergone an environmental assessment. Results also indicate that the legal arrangements, and in particular the level of independence of the SEA authority (which in Italy and Spain is determined at the regional level), affect the quality and quantity of requested changes. In regions where the SEA Authority is established at a higher level in the planning hierarchy, more substantial changes tended to be required, including more mitigation and compensation measures. On the contrary, in regions where a subsidiary approach is in place, i.e. the SEA authority is established within the same municipality that elaborates the plan, less substantial modifications are more often required. We conclude that in the Spanish and Italian contexts a more effective SEA, in terms of environmental performance of urban plans, is supported by institutional arrangements that provide for an SEA Authority clearly separated and fully independent from the planning Authority.

1. Introduction

The literature on Strategic Environmental Assessment (SEA) has grown steadily over the past 20 years, and it is now one of the liveliest fields of impact assessment research, as shown for example by the bibliometric analysis presented in Li and Zhao (2015). This literature has focused on a number of issues, such as the meaning and the philosophy of SEA, the identification of different systems and procedures, the review of real-world practices, and the overall understanding of what makes SEA effective (Fischer and Onyango, 2012).

Increasingly, scholars have been countering the somewhat self-referential nature of the early SEA literature by bridging the gap between other academic domains and linking SEA to key topics in planning and policy-making, like organizational learning (Jha-Thakur et al., 2009; Gazzola et al., 2011), public participation (Gauthier et al., 2011; Walker et al., 2014; Rega and Bonifazi, 2014), governance (Meuleman, 2015; Monteiro and Partidário, 2017), environmental justice (Connelly and Richardson 2005, Jackson and Illsley, 2007, McLauchlan and João, 2012), and power (Walker, 2010; Cashmore and Richardson, 2013).

A key point emphasized by the literature is the significance of the broader context in which SEA takes place in influencing how SEA is conducted and how effective it is (Kørnøv and Thissen, 2000; Fischer and Gazzola, 2006, Hilding-Rydevik and Bjarnadóttir, 2007; Wang et al., 2012). SEA indeed does not occur in an empty space, but is embedded in a broader political and decision-making context, made of different actors with different aims and perspectives. Since the early

☆ The authors equally contributed in designing the research. CR carried out the analysis on the Italian case studies, JPS carried out the analysis on the Spanish case studies. As for the writing of the paper, CR wrote sections 2.1, 3 (with contribution from both authors), 4.1, 4.2.1 and 5 (with contribution from both authors) and contributed to section 1; JPS wrote sections 2.2, 4.2.2 and contributed to sections 3 and 5. DG wrote section 1, (with contributions from CR) and contributed to sections 3 and 5. Section 6 is the result of the equal contribution of the three authors, who read and approved the final manuscript.

* Corresponding author.
E-mail address: carlo.rega@ec.europa.eu (C. Rega).
[1] Currently at: European Commission Joint Research Centre, Directorate for Sustainable Resources, Ispra (VA), Italy.

https://doi.org/10.1016/j.eiar.2018.07.004
Received 5 February 2018; Received in revised form 18 June 2018; Accepted 13 July 2018

days of SEA, it was recognized that the '*implementation of SEA depends on effective political will…'* needing *'administrative and institutional mechanisms (…) and the most appropriate ways to ensure a certain degree of accountability'*, (Partidario, 1996: 9,), a concern subsequently shared by other authors (Kørnøv and Thissen, 2000; Wallington, 2002; Bina, 2003 as cited by Monteiro and Partidário, 2017).

The literature has thus widely advocated the need for SEA to analyse the broad decision-making context in which it is integrated, to increase its effectiveness (Kørnøv and Thissen, 2000; Nitz and Brown, 2001; Dalkmann et al., 2004; Hilding-Rydevik and Bjarnadóttir, 2007; Monteiro and Partidário, 2017). The decision-making context and the legal arrangements are in turn key factors that determine the SEA outcomes (Nykvist and Nilsson, 2009; Wang et al., 2012). In reviewing critical factors for SEA implementation, Zhang et al. (2013) pointed out that legal framework can provide a firm basis for effective implementation including, inter alia, legally binding roles and responsibilities of related actors (Noble, 2009; van Buuren and Nooteboom, 2009), and well defined legal provisions (Buckley, 2000; Noble, 2004). The debate however is still open as regards which characteristics of the institutional framework lead to more effective SEA, as the empirical evidence in this respect is very limited.

In this research, we considered a specific element of the institutional framework: the degree of independence of the SEA Authority from the planning authority. In some SEA systems (referred to as "independent" hereafter), the SEA Authority is separated from the planning authority, typically because it sits at a higher tier (e.g. a regional authority that oversees SEA of municipal planning). In other systems ("subsidiary", hereafter), the SEA Authority is appointed within the same administration responsible for the plan (e.g., the planning authority is the Planning Department of a municipality, whilst the SEA Authority is the Environment Department of the same municipality).

In principle, both models have pros and cons: the independent model clearly decreases the risk of lack of impartiality in the assessment but creates a "distance" between the planning and the SEA authority, which might affect communication flow, lengthen the procedure and lead to inter-institutional conflicts. The subsidiary model may lead to auto-referential assessment, but on the other hand, the "proximity" between the two authorities can facilitate communication and consultation and expedite the procedure. A "local" SEA Authority can also have a more accurate knowledge of specific environmental (and socio-economic) problems of the Municipality and the expectations of the citizenships. On the other hand, by the same reason, it might lack a comprehensive vision of broader environmental problems acting at a larger scale (e.g. air/water pollution, ecological networks).

The concept of SEA effectiveness has received constant attention through the years, since the early identification of key elements for an effective SEA (Partidário, 2000), to the proposal of more specific criteria to evaluate practice in different contexts and for different purposes (Retief, 2007; van Buuren and Nooteboom, 2009; Therivel et al., 2009), until the most recent attempts to assess the actual impact of SEA (Acharibasam and Noble, 2014).

Definitions of effectiveness in SEA, and more generally in impact assessment, are not always consistent, and the debate on the different dimensions and nuances of effectiveness is still open (see for example Bond et al., 2013 and Cashmore et al., 2010). Overviews and discussions of the wide variety of perspectives associated to effectiveness in impact assessment are presented in Loomis and Dziedzic (2018) and Chanchitpricha and Bond (2013). Bina et al. (2011) propose to distinguish between procedural, incremental, and substantive effectiveness. Procedural effectiveness focuses on the fulfilment of the procedural and legal requirements of SEA, including for example transparency, independency, and credibility (see also van Buuren and Nooteboom, 2009). Incremental effectiveness refers to the contribution of SEA to the broader concept of better environmental governance and management, which include the analysis of SEA outcomes in the medium- and long-term with respect to issues such as social, organizational and institutional learning (e.g., Jha-Thakur et al., 2009). Finally, substantive effectiveness includes the effects that the SEA produce "in the decision-makers' understanding or awareness of environmental and sustainability issues, and in the extent to which such issues are considered throughout the planning and decision-making" (Bina et al., 2011, p. 573).

In this paper, we focus on substantive effectiveness of SEA for urban planning, and particularly on the changes that SEA produces in the plans in which it is applied. These changes represent the immediate effects of SEA (Acharibasam and Noble, 2014). Although they address just a part of the effectiveness concept, it is not one that can be neglected (Geneletti, 2015; Geneletti et al., 2017). The analysis of the changes determined by the SEA allows understanding whether SEA is actually delivering in terms of providing for a high level of environmental protection, using the wording of the European Union "SEA Directive". In the words of Partidário (2000), ultimately "the success of the SEA should be measured in relation to the quality of the final decision, and the extent to which the decision was improved as a result of the SEA approach."

Several criteria to evaluate SEA substantive effectiveness (as well as other dimension of effectiveness) have been developed over the years by scholars, international organizations and associations of experts/practitioners (see e.g. IAIA (International Association for Impact Assessment), 2002; Therivel, 2004; IEMA (Institute of Environ. Manag. and Assessment), 2005; OECD (Organization for Economic Cooperation and Development), 2007; Partidario, 2007). For instance, the OECD (2007) defines two sets of criteria to evaluate SEA's effectiveness: the first set is used to evaluate the delivery of envisaged outcomes, the second one is a quality control check of SEA as a process Thus, the first one evaluate substantial effectiveness, whilst the second one evaluate procedural and incremental effectiveness. The key questions to evaluate substantive effectiveness are: "*Did the SEA predict future outcomes correctly*"; "*Did the SEA succeed in actually changing the PPP/making the PPP more environmentally sound?*" And "*Did the SEA succeed in actually changing the PPP implementation or budget plans, or other subsequent measures, making the PPP more environmentally sound?*" (OECD, 2007; pag. 125–126). Thus, the focus here is on how the plan actually changed as a result of SEA.

Concerning the relationship of SEA with the decision-making process, two key principles can be singled out from the body of literature of SEA effectiveness (Fischer and Gazzola, 2006): i) flexibility and capability to adapt to the decision-making process and ii) accountability (e.g., professionalism, rigor, impartiality, presence of independent checks). However, as discussed by Fischer and Gazzola (2006), SEA effectiveness criteria have been developed mainly in the UK and northern European countries, so they may not be as much valid in other contexts, like Mediterranean countries featuring different planning/programming traditions and institutional cultures. They discuss the case of Italy and concluded that in this Country SEA should be based on a rigid and structured process subjected to rigorous controls, rather than a flexible and adaptive one. The risk would be to have non-transparent and non-accountable SEA systems.

Empirical studies of substantive effectiveness are largely based on two approaches: reviews of SEA reports, and interviews with actors (Acharibasam and Noble, 2014; Therivel et al., 2009; Fischer, 2010; Rega and Bonifazi, 2014). Both methods, and particularly their combination, provide important insights on how good and effective a given SEA system is, and support the formulation of recommendation and suggestions for improvement (Bragagnolo et al., 2012). However, there are shortcomings associated to these approaches. The review of SEA reports is limited by the fact that the reports are not always explicit in describing how the interaction between plan making and SEA occurred, hence it can be difficult to determine the actual role played by SEA in shaping the content of the plan (Rega and Bonifazi, 2014). Additionally, SEA reports may contain recommendations or suggestions (e.g., related to mitigation measures), which are not necessarily reflected in the

plans, and it can be challenging to single out the elements that were actually included in the final decision. As a result, the risk with this approach is to evaluate the appropriateness and completeness of the SEA report, more than to provide evidence on the actual output of the process in terms of influencing the plan. Interviews suffer from the limitations associated to self-reporting in general, such as the presence of biases and of different interpretations and understanding (Stone et al., 1999). Biases can be particularly evident in those contexts where the interaction between planners, SEA experts and public officers is very close, leading to overlaps in roles and alteration of the perception of the contribution of the SEA process.

In this paper, we propose a different approach to evaluate SEA effectiveness. We selected a sample of SEA then analyzed the changes in the plans enforced by SEA authorities. These changes are therefore an explicit and unequivocal result of the SEA process.

As mentioned before, two main SEA legal systems are in place Italy and Spain, differing with regard to the degree of independence of the SEA authorities. This lead to the formulation of our specific research objective: understanding whether the substantive effectiveness of SEA is influenced by that factor. To the best of our knowledge, this issue has not been addressed by previous research, at least in an international context. To increase the international relevance of our approach, the study was conducted in two countries, Italy and Spain: they were selected because the coexistence of the two SEA models within the same national legislations at regional level allows investigating the influence of this specific aspect within contexts that are otherwise similar. Furthermore, these two countries, in particular Spain, have received relatively less attention from the SEA literature compared to Anglo-Saxon and northern European ones, so providing empirical evidence from them may add novel empirical insights to the SEA literature on effectiveness (in line with Fischer and Gazzola, 2006). The authors have direct experience as SEA scholars and practitioners in these countries and could access first-hand information and relevant documents.

The key elements of the Italian and Spanish SEA systems are presented in Section 2. Section 3 describes the methods used to select the sample of SEA processes, and extract the information relevant for the study. Results are presented in Section 4, first by showing the overall results for the whole sample of SEA, and then more specific insights from four selected case studies. Finally, Section 5 discusses the results in the frame of the international debate of SEA effectiveness, and Section 6 provides some conclusive remarks.

2. Overview of relevant elements of the Italian and Spanish SEA systems

2.1. Italy

The Italian SEA law (contained in the National Decree 152 of April 3, 2006, amended in 2008 and finally in 2010) substantially adheres to the EU Directive's text as regards most aspects of the SEA procedure but it introduces an innovative element as far as the decision-making process is concerned: a SEA Authority different from the Authority that draws the plan. The former is in charge of supervising the SEA process and evaluate the environmental compatibility of the proposed plan based on the information provided in Environmental Report (whose elaboration is the responsibility of the Authority that elaborates the plan), the outcomes of consultations and its own evaluations.

The SEA Authority issues a Reasoned Opinion (*Parere Motivato),* i.e. a final statement on the overall compatibility of the plan, which may contain request for changes (including mitigation measures) in the plan's content, if the expected environmental impacts are considered not acceptable. The Authority in change of the plan must amend it accordingly, before proceeding to the approval procedure. These arrangements thus follow an EIA-like approach, with an external Authority in charge of issuing a formal approval of the plan based on environmental considerations.

Another key feature of the Italian SEA system is its regional diversification. Legal provisions thus vary between Regions that, according to the national Law, have to identify the Administration that shall act as the SEA Authority. Some regions made a clear distinction between the SEA Authority and the ones that elaborates the plans, whilst other opted for a "subsidiarity" model, where the SEA Authority is a different Department within the same Administration. In the case of Urban Planning, municipalities are in charge of their elaboration, whilst, depending on the regional arrangements, the SEA Authority may be established at the Regional level or at the Municipal level.

2.2. Spain

European Directive 2001/42/EC has been transposed in the Spanish legislation through national law n. 9/2006. Similarly to Italy, the law introduces a clear difference between the Authority responsible for elaborating and adopting the plan (called *Órgano Promotor*) and the Authority responsible for the evaluation of the environmental impact of the proposed plan/program and for the supervision of the whole SEA process (*Órgano Ambiental* – Environmental Authority). Once the plan and attached SEA report is finalised, the Environmental Authority is in charge to evaluate it and issue an official statement (*Memoria Ambiental*) in which the actual consideration of the environmental issues into the plan is evaluated, as well as the outcomes of public consultations and their integration into the plan. This document may also contain legally binding prescriptions concerning environmental issues (such as mitigation or compensation measures) and it is therefore analogous to the Italian "Reasoned Opinion".

The implementation of this national legal framework is the responsibility of Regional Authorities that, through regional legislation, appoint the Environmental Authority for the different types of plans and programs. In the case of urban planning, some Regions appointed a clearly distinguished Authority as the Environmental Authority, usually at a higher governance level, whilst other ones identified it as a separate department/office within the same planning Authority.

3. Methods

The method is based on the review of the documents containing the "Reasoned Opinions" i.e. the final statement issued by the SEA Authorities envisaged by both the Italian and Spanish legislations that formally concludes the SEA procedure. These documents summarize the inquiry carried out by the authorities on the overall environmental compatibility of the proposed urban plans. As such, they provide more valuable information than the Environmental Reports alone, as they are the outcome of an independent inquiry that benefitted also from the inputs provided by the public and the consulted authorities with specific environmental responsibilities.

We selected a sample of 40 urban plans, 20 from Italy (10 each from the Lombardy and Piedmont regions) and 20 from Spain (12 from Catalonia, 8 from the Basque Country) (Table 1). In both countries, we focused on regions with different arrangements in terms of the SEA Authority, and then selected the sample based on the following criteria:

- Plans that had already completed the SEA procedures, so that the Reasoned Opinion was available
- Availability of documents on the web
- Coverage of different geographic and environmental contexts, (i.e. both small and large municipalities with different environmental conditions)

In Piedmont and Catalonia, the SEA competent authority for municipal plans is established at the Regional level, so that it is fully independent from the Planning Authority; we therefore grouped these two regions under the "independent" SEA model. Conversely, in Lombardy, the regional legislation appoints the SEA Authority within

Table 1
List of the Municipalities in Italy and Spain whose urban plans and Reasoned Opinion were analyzed in this study, with the corresponding Region and SEA Competent Authority model.

State	Region	SEA authority	Municipalities
Italy	Lombardy	Subsidiary	Bergamo
			Brescia
			Crema
			Cremona
			Lodi
			Mantova
			Milano
			Sesto S. Giovani
			Sondrio
			Vigevano
	Piedmont	Independent	Arona
			Bra
			Busca
			Cassine
			Fiorano Canavese
			Masio
			Montanaro
			Nole
			Roasio
			Villastellone
Spain	Catalonia	Independent	Alguaire
			Ampolla
			Arnés
			Barcelona-Vallbona
			Blanes
			Cabacés
			Castelló d'Ampúries
			Girona
			Sils
			Tarragona
			Vallés Oriental
	Basque Country	Subsidiary	MP NNSS Mungia
			Deba
			Azkoitia
			Hondarribia
			Vitoria Gasteiz
			PTP Laguardia
			Gasteiz-Zabalgana
			Bilbao-Zorrotzaurre

the same municipality, while in the Basque Country the SEA Authority elaborates the Environmental Impact Joint Assessment Report jointly with the planning authority or the promotor of the plan. These two regions were thus grouped under the "Subsidiary" SEA model.[2]

The following questions were used to guide the review of the Reasoned Opinion documents:

- Did the Reasoned Opinion request minor modifications to the Plan? If so, which aspect did they concern?
- Did the Reasoned Opinion request major modifications to the plan? If so, which aspect did they concern?
- Did the Reasoned Opinion request the planning authority to introduce measures (not already envisaged in the original plan/ Environmental Report) to mitigate and/or compensate identified negative impacts? If so, which ones?
- Did the Reasoned Opinion request amendments to the monitoring plan?

[2] In the Basque Country, the new 211/2012 Decree regulating the SEA process came into force on November the 20th, 2012. However, this paper focus on the previous 3/1998 SEA regulation has and corresponding documents have been analyzed. According to the latter administrative process, the last document released by the EA is called Final Report ("Informe Definitivo"). This report is equivalent to the Environmental Report as called out in the National Law 6/2009 regulation and is issued by the Environmental Authority.

For the purpose of this study, "major modifications" mean significant changes to the Plan aimed at avoiding unacceptable environmental impact. They include for example the decrease/cancellation of new areas envisaged for urban development, changes of envisaged land use destinations (e.g. from agricultural to residential/industrial), or significant decreases in the building indexes in development areas. Minor modifications are adjustments required to avoid residual environmental impacts, which however do not substantially affect the plan (see Table 2 for examples).

Mitigation measures include all actions aimed at reducing to an acceptable level the impact of new envisaged developments, such as the provision for minimum impermeable areas in new developments sites, preservation of ecological corridors, or provisions for higher energy efficiency in new buildings. Compensation measures were defined as those proactive actions required to offset unavoidable residual impacts such as creation of new green areas, natural restoration and ecological enhancement - e.g. tree planting, land remediation (Rega, 2013). Mitigations and compensations could entail either minor or major changes to the plans, as defined previously, although mitigations were more frequently minor ones and vice versa for compensation. Amendments to the monitoring plan concern the provisions of art. 10 of the SEA Directive, which requires planning authority to monitor over time the environmental effects of the implemented plan or program.

For each examined case, we thus recorded the main environmental issues raised by the Reasoned Opinion to identify the recurrent ones and the specific mitigation and compensation measures required, as well as other changes requested by the SEA Authority. To test whether the degree of independence of the SEA Authority affects SEA effectiveness, we first conducted the analysis by separating Italian and Spanish cases, then split them according to the Region and finally re-grouped them according to the "SEA system" (independent vs subsidiary).

To gain a deeper understanding of the influence of different SEA systems on plans' outcomes, we then enriched our analysis with an in-depth examination of 4 case studies, two for each country and SEA system. We looked closely at the specific requests made by SEA authority to the planning authorities ad their relevance with respect to the plans' contents and their environmental significance. Through this analysis, we aim at providing additional evidence supporting and complementing the results of the overarching analysis.

4. Results

4.1. Overarching analysis

After reviewing the plans and the correspondent Reasoned Opinions, we grouped the most recurring environmental issues addressed by the SEA authority in the 13 categories listed in Table 2, where examples for each category are provided.

Table 3 shows the relative frequency of amendments to the original plan required by the Reasoned Opinion, with reference to the environmental issues listed above. In both countries, requests to decrease land take emerge as the most frequently addressed issue, followed by inclusion/increase of green areas and decrease of urban density. Overall, changes to the original plan were required in 95% of Spanish cases and 90% of Italian ones. In Table 4 the results are broken-down by region. The percentage of cases for which some changes to the plan was required as result of the SEA process are 100% in Catalonia, 87.5% in the Basque Country and 90% in Lombardy and Piedmont each. Differences can be observed as concerns the environmental issues addressed by the Reasoned Opinion: in Piedmont, 90% of them required modification of planned land use changes (mainly requesting decreases in urban development), while the figure in Lombardy is relatively lower: 60%. 42% of plans in Catalonia and 40% in Lombardy were requested to lower the planned densities of urban areas, while this was never the case in Piedmont and only in 12.5% of cases in Basque Country. A more detailed analysis suggests that in the Italian regions the difference is

Table 2
Examples of major and minor modifications required by the Reasoned Opinion documents.

Environmental Issues	Examples of major modification	Examples of minor modification
Decrease of land take	Removal of new planned developments or strong decrease of the allowed area for new developments;	Slight decrease of the planned area of new developments; prescription and directives to decrease soil sealing (e.g. use of permeable covers in parking areas)
Density of urban areas	Strong decrease of planned residential density in new developments (no. of allowed new residents per areal unit)	Slight decrease of planned residential density in new developments
Inclusion of green areas	Prescription for including new green areas in new developments, originally not foreseen by the plan;	Increase of the surface of new green areas already foreseen by the plan.
Sustainable modes of transport	Establishment of transport infrastructure or systems to decrease the use of private cars, e.g. new public transport lines	Establishment of cycling paths, pedestrian zones, enhancement of public transport (e.g. new bus stops), to
EIA/Project tier: *prescriptions and directives for future projects subject to EIA*	Exclusion of certain types of projects (e.g. industrial developments, power plants etc.) in certain areas	Limitation and directives for future projects (e.g. maximum size, minimum distance from residential areas)
Livestock regulation	Prohibition of dispersal of slurry in sensitive areas;	Limits to the allowed quantity of slurry that can be dispersed, delineation of specific dispersal areas
Use of water sources and sustainable use of water	Prescriptions for the construction of systems for water collection and recycling in new planned developments.	Prescription and directions to increase domestic water use efficiency, e.g. technical solutions to control tap water fluxes.
Waste management	Prescriptions for the construction of new systems for waste collection and recycling in new planned developments.	Enhancement of existing waste collection systems (e.g. provision of additional garbage bins for recycling)
Civil protection	Identification of buffer zones around industrial plants at risk of major accident where new developments are not allowed or are subject to specific constraints	Slight increase of buffer zones around industrial sites.
Energetic efficiency of new buildings	Strict definition of minimum required energy efficiency of new buildings;	Directions to improve energy efficiency of new building, e.g. better
Construction of new roads	Removal of new foreseen roads, major changes to roads blueprints (alternative routes not to interfere with natural areas)	Slight changes to road blueprints (e.g. to guarantee a minimum distance from residential areas), prescription of technical improvements (e.g. acoustic barriers)
Landscape impact of new buildings	Establishment of maximum heights of new buildings	Prescription/directives on the use of materials, styles and layout of new buildings to correctly insert them in the landscape context
Acoustic impact	–	Creation of anti-noise barriers.

Table 3
No. of cases in which the SEA competent authority required changes to the original plan in relation to the main identified environmental issues in Italy and Spain.

Environmental issues	No of cases that included changes due to RO		% of cases that included changes due to RO	
	Spain	Italy	% Spain	% Italy
Land use changes	18	15	94.7%	83.3%
Inclusion of green areas	9	3	47.4%	16.7%
Density of urban areas	6	4	31.6%	22.2%
Use of water sources and sustainable use of water	5	4	26.3%	22.2%
Sustainable modes of transport	4	0	21.1%	0.0%
Waste management	4	3	21.1%	16.7%
Civil protection	2	3	10.5%	16.7%
EIA/Project tier	1	0	5.3%	0.0%
Livestock	1	0	5.3%	0.0%
Energy efficiency of new buildings	1	8	5.3%	44.4%
Landscape impact of new buildings	2	3	10.5%	16.7%
Acoustic impact	1	2	5.3%	11.1%
Construction of new roads (alternative routes not to interfere with natural areas)	0	3	0.0%	16.7%
Cases that included changes due to RO – total	19	18	95.0%	90.0%

mainly due to the fact that in Piedmont the Reasoned Opinion in many cases required to remove provisions for new urban development, whilst in Lombardy the SEA Authority only required to reduce in size or density the development proposals.

The magnitude of the changes to the original plans required by the SEA Competent Authorities is shown by Fig. 1, illustrating the differences between Italy and Spain (upper panel) and by showing the four Regions individually (lower panel). When the two countries are compared, the main difference refers to monitoring requirements, with higher frequency in Italy than Spain (55% vs 20%). No changes were required in 5 and 10% of the cases, respectively for Spain and Italy). Mitigation/compensation measures were required in 75% of the cases in both countries. Finally, minor/no changes occurred more frequently in Spain than Italy (55% vs 45%), while a specular figure was found for major changes (Italy 55% of plans; Spain 45%).

More insights can be gained by analyzing the four regions separately (Fig. 1, lower panel). In Catalonia, the number of plans with minor/no changes is the same as the number of plans with major changes. In the Basque Country, a difference emerges: minor/no changes occurred in 63% of the cases, while major ones in 38%. In Piedmont, the difference is even larger: minor/no changes occurred only in 20% of the examined plans, whilst for the remaining 80% major modification were required. Conversely, in Lombardy the SEA Authority required minor changes in the majority of the cases (70%) and major changes only in 30% of the plans. In Catalonia and Piedmont, additional mitigation/compensation measures were required with similar frequency (83 and 90% respectively), higher than in Basque Country and Lombardy (respectively 62.5% and 60%).

In short, these results suggest that the regional SEA model (as defined in Section 2) can better explain observed differences than the

Table 4
No and % of cases in which the SEA competent authority required changes to the original plan in relation to the main identified environmental issues in the four examined Regions.

Environmental issues	No. of cases that included changes due to RO				% of cases that included changes due to RO			
	Catalonia	Basque C	Piedmont	Lombardy	Catalonia	Basque C	Piedmont	Lombardy
Soil use changes	10	8	9	6	83.3%	100.0%	90.0%	60.0%
Inclusion of green areas	5	4	2	1	41.7%	50.0%	20.0%	10.0%
Density of urban areas	5	1	0	4	41.7%	12.5%	0.0%	40.0%
Sustainable modes of transport	4	0	0	0	33.3%	0.0%	0.0%	0.0%
Waste management	3	1	3	0	25.0%	12.5%	30.0%	0.0%
Use of water sources and sustainable use of water	4	1	1	3	33.3%	12.5%	10.0%	30.0%
Civil protection	2	0	2	1	16.7%	0.0%	20.0%	10.0%
EIA/Project tier	1	0	0	0	8.3%	0.0%	0.0%	0.0%
Livestock	1	0	0	0	8.3%	0.0%	0.0%	0.0%
Energy efficiency of new buildings	0	1	4	4	0.0%	12.5%	40.0%	40.0%
Landscape impact of new buildings	1	1	2	1	8.3%	12.5%	20.0%	10.0%
Acoustic impact	1	0	0	2	8.3%	0.0%	0.0%	20.0%
Construction of new roads (alternative routes not to interfere with natural areas)	0	0	3	0	0.0%	0.0%	30.0%	0.0%
Cases that included changes due to RO	12	7	9	9	100.0%	87.5%	90.0%	90.0%

comparison at the country level. When the two SEA models are compared by groping cases from Catalonia and Piedmont, and Lombardy and Basque Country differences become evident (Fig. 2). Under the subsidiary model, the SEA authority required major changes, overall, only in one third of the case and minor amendments in two thirds of the examined plans. The situation is almost exactly specular under the independent model: in this case, major changes were required in 64% of the plans and minor ones in the remaining 36%. SEA Authorities more often requested also additional compensation/mitigation measures under the independent model compared to the subsidiary one (86% of cases vs 61%) as well as additional monitoring requirements, although in this last case the difference is less pronounced (41% vs 33%).

4.2. Case studies

In order to gain insights on the actual changes required to plans under different SEA models, in this section we provide more detailed information on the contents of the RO in four plans, two in Italy and two in Spain, one for each Region and SEA model. Synthetic information on the four case studies is provided in Table 5.

4.2.1. Italy

The two selected plans are those of Crema (Lombardy) and Bra (Piedmont). The size and characteristics of the two towns are comparable (Table 5). Both towns are the centre of highly productive agricultural areas and have a strong industrial fabric of small and medium enterprises linked to agriculture, livestock raising, mechanics and textile. At the same time, economic changes occurred in the last years have determined the abandonment of productive sites in the urban fabric prone to brownfields redevelopment. Both plans envisage new residential and mixed developments, part of which on brownfield and part as new expansions on agricultural areas.

The environmental assessment of the plan's measures is carried out through matrixes crossing actions and possible environmental receptors. Concerning new developments, a deeper analysis is performed through the elaboration of specific fiches for each new area and an assessment of the additional anthropic load in terms of soil sealed, new potential inhabitants and derived impacts such as increased waste production and energy and water consumption. Mitigation measures are then proposed and in both cases include the creation of green buffers, directions for adequate landscape insertion of new buildings, and other sustainability measures - e.g. requirements of energetic efficiency of new buildings, water saving devices, rain water recycling and minimum percentage of permeable soil in new developments. None of the report, however, contain a detailed description of considered alternatives.

The first version of the urban plan of Crema was adopted by the municipal Council in December 2010. The main feature of the plan is the identification of 10 new development areas, 7 of which inside the urban fabric (brownfield redevelopments) and 3 on remnants of agricultural areas in the outskirts. The RO issued by the SEA Competent Authority (the environmental department of the same municipality) deemed the plan environmentally compatible subject to some conditions. These did not entail major changes to plan's main strategies (identification of new development areas) but rather introduced minor restrictions like the prohibition of specific land uses and the need to fully implement the mitigation measures described in the Environmental Report. In some cases the RO provided more detail on specific mitigation measures, but overall no substantial additional measures other that those contained in the Environmental Report were requested. Other minor requirements concerned the integration to baseline data of the Environmental Report and a clearer description of monitoring provisions. In sum, the prescriptions contained in the RO do not alter the overall anthropic load envisaged by the plan in terms of new built volume and potential new inhabitants. The final version of the plan was officially approved in June 2011. At this stage, no further amendments were required by the SEA competent Authority, which just confirmed the statements expressed in the first RO.

The plan of Bra was approved in November 2012. The main actions envisaged by the plan is the identification of 9 areas for new residential and productive developments, 5 of which within the urban fabric and 4 on undeveloped areas (agricultural land). Several major revisions to the plan were requested by the SEA competent Authority (the Regional Environmental Department) in its RO. It was first requested to consider different alternatives for new developments and to enhance the monitoring program with new indicators concerning the level of habitat fragmentation and landscape preservation through visual analysis from salient vista points and the elaboration of rendering and simulations for new buildings in sensible areas evolution in time. The main request was the complete removal of the 4 new residential areas foreseen by the plan on fertile agricultural soil. The mitigation measures envisaged by the Environmental Report were not considered sufficient by the SEA Authority that required the increase of a green buffer zone near the motorway and the introduction of similar buffer zones near other major roads. It also enforced the use of techniques and materials to decrease the total soil sealed for the realization of car parking areas and the adequate management of canals and irrigation systems. Plan's norms were subjected to integration to guarantee an adequate management of

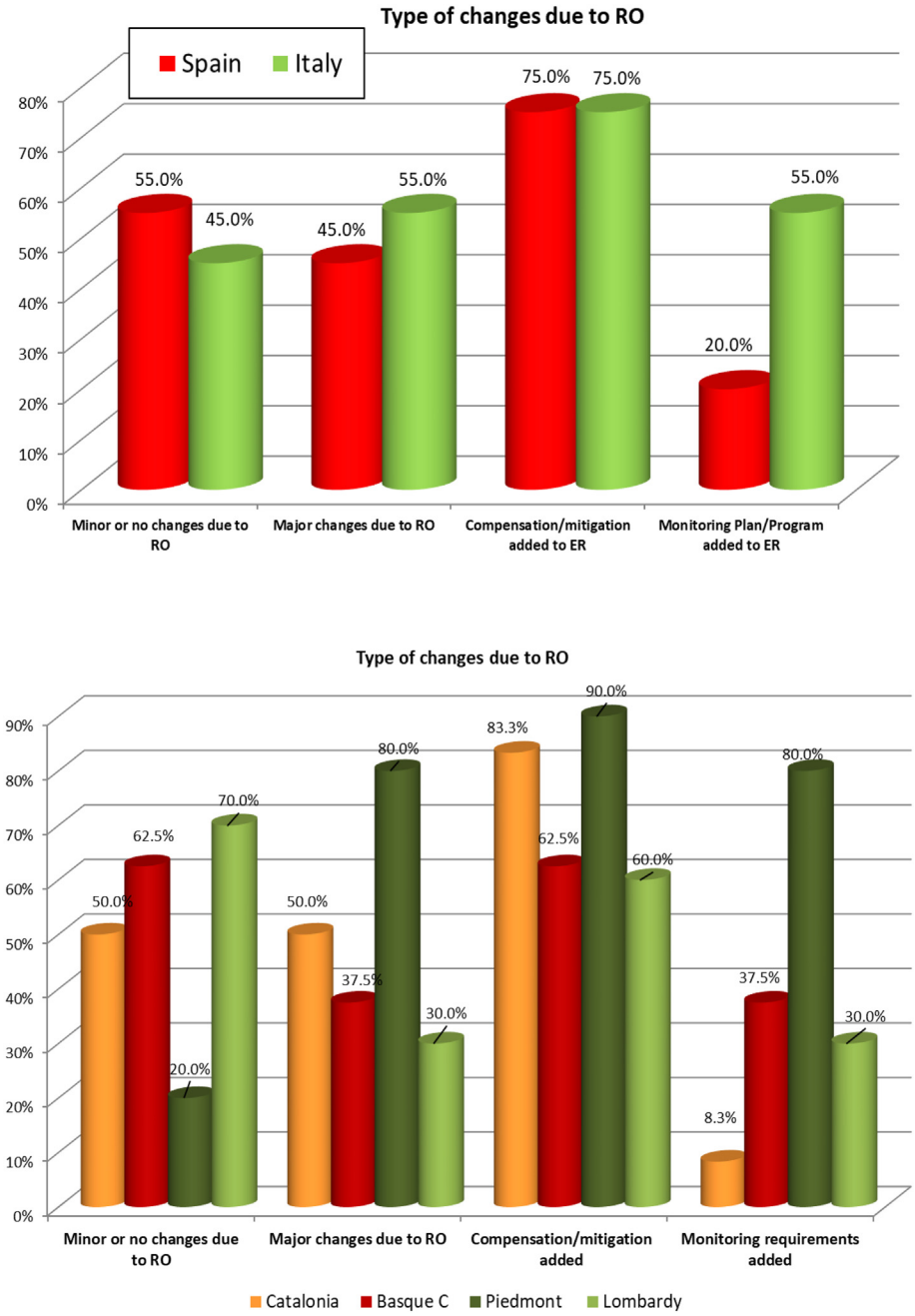

Fig. 1. Upper panel: frequency of the types of changes to the plan requested by the SEA competent Authority in Italy (Piedmont and Lombardy) and Spain (Catalonia and Basque Country). Lower panel: Frequency of the different types of changes to the urban plan required by the SEA Authority in the four examined regions.

rain waters superficial flows; measures to mitigate the impact on birds of new retail buildings with transparent facades were also introduced, as well as the compulsoriness of offsets measure for woodland clearance. Finally, it was requested to decrease the maximum height of new buildings in two identified urban expansions and to provide a specific analysis on industrial sites at risk of major incidents. The RO thus altered significantly the overall anthropic load of new foreseen development, not only by introducing additional mitigation measures but also by substantially decreasing the number and size of new developments on unsealed soil.

4.2.2. Spain

The selected plans in Spain are Vitoria Gasteiz's Urban General Plan Partial Amendment (VG UGPA, Basque Country) and L'Ampolla's Urban Plan (LA UP Catalonia). Although the towns are not comparable in terms of overall population and area (Vitoria Gasteiz is much larger than l'Ampolla), the VG UGPA targets a small portion of the city, namely Olarizu Avenue, embracing a total population which may be comparable to L'Ampolla. The plans provide a good examples of subsidiary versus independent models in the Spanish context.

The Reasoned Opinion to LA UP requested major modifications to the Plan through a major modification in the Environmental Report. Changes concerning the urban development overall area, urban classification of soils in different sectors, particularly in two sectors (named ×1 and Z, where additional services were planned away from the urban area by the draft Urban Plan) were requested.

The first Environmental Report issued in August 7th, 2009 was rejected by the environmental authority due to major fails on Strategic Environmental Assessment provisions and particularly on the Environmental Report environmental considerations.

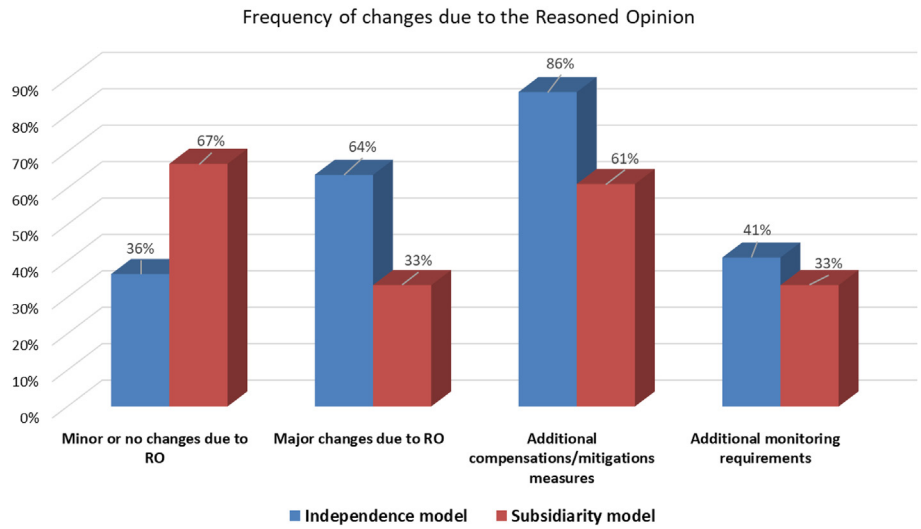

Fig. 2. Frequency of the types of changes requested by the SEA competent Authorities grouped by SEA model (Independence = Catalonia + Piedmont; Subsidiarity = Basque country + Lombardy).

Table 5
background inforation on the 4 selected case studies.

Country	Region	Town	SEA model	Population	Area
Italy	Piedmont	Bra	Independent	30,000	59 km^2
	Lombardy	Crema	Subsidiary	34,000	34.5 km^2
Spain	Catalonia	L'Ampolla	Independent	3300	35.6 km^2
	Basque Country	Vitoria-Gasteiz	Subsidiary	247,000	276.8 km^2

The second Environmental Report was issued on January 19th, 2010 and delivered to the Environmental Authority by L'Ampolla town Planning Department. Additional environmental mitigation and compensation measures were set out by the environmental authority to the Environmental Report, such as:

- X1 sector final soil classification as non-urban;
- Fully review the Urban Plan soil provision in terms of land occupation and use;
- Guarantee ecological connectivity in sectors included in project X as well as in Barranc de Sant Pere, Barranc de Baconer i de Cap Roig;
- To include in the Urban Plan's derived regulations all provisions as called out in the RO.

In this case, the RO had played a significant role in the implementation of sound environmental changes to the Urban Plan by reducing the land take and guaranteeing environmental connectivity.

The VG UGPA main goal was to define a new urban boundary in the Olarizu Avenue by substituting 124 properties and resettle their owners while enhancing the land take to improve new homes' conditions. The land take would affect non-urban areas that were being used as agricultural land.

The RO did not entail major changes to the plan. Although the RO raised that the EsECIA (joint environmental impact assessment report) lacked of a comparative analysis with the Agenda 21 and the Agroforest Territorial Sector Plan, major modifications were not requested in the RO. Furthermore, the RO requested the Urban Plan included preventive and protective measures as well as monitoring program as proposed by the EsECIA. The goal is that these measures were included in the tender documents released for the development of the Plan. Finally, the RO requested in a rather general way that associated documents to the Urban Plan promoted environmental provisions as included in the Reference Document.

In this case the prescriptions contained in the RO did not entailed significant modifications of the initial Urban Plan. Only some general drivers about mainstreaming environmental provisions into the planning process were set out.

5. Discussion

The results of this study can be examined and discussed in the frame of the wider international debate on SEA effectiveness in different contexts, and can help to shed some light on the issues raised in section 1 about the influence of the legal context on substantive effectiveness and the possible tension between the two criteria of flexibility and accountability. Concerning the first point, our results clearly show how the substantive effectiveness of SEA – the degree of changes of original plans towards more environmentally sustainable courses of action – was affected by the 'context' in terms of legal arrangements of the SEA authority, and at the same time they bring out a trade-off between accountability and flexibility.

It should be noted in fact that in the examined cases, SEA was indeed adaptive to the decision making mechanisms in which it was embedded. Actually, the distinction between an independent and subsidiary approach in the SEA models in the examined regions simply reflects already existing mechanisms for urban plan's approval. In Lombardy and the Basque Country municipalities have a strong discretionary power in the final approval of their own plans, while the contrary happens in Catalonia and Piedmont. The SEA legal arrangements in place thus seem to be well adapted to the planning contexts. However, this raises issues concerning accountability.

To this regard, it is important to remark that changes in the examined RO were requested by the SEA authority after the environmental assessment carried out by the proponent was completed. That is, the contribution of the SEA to the plan from within the planning authority, responsible for elaborating the ER, is often not considered sufficient by the SEA authorities. The situation in the two countries is thus still far from one in which environmental considerations are fully integrated in planning from the outset, with no need for further procedures, which should be the ultimate goal of SEA (Partidario, 2000). This also suggests that the presence of an external SEA authority, provided for by the Italian and Spanish legislations, is indeed necessary. This responds to the accountability criteria, whereby, as mentioned earlier, SEA should be impartial and subjected to external check and verification.

However, our results show that the level of external verification

varied significantly between the two SEA models. When examined at the aggregate national level, no striking differences emerged between Italian and Spanish cases (Fig. 1 upper panel). Instead, clear differences emerged when grouping the cases according to the SEA model, indicating that this factor has a higher explanatory power in explaining the observations (Figs. 1 and 2). The relevance of the changes required by SEA Authorities is higher under the independent model, this including two key elements of environmental assessment, such as offset/mitigation measures and environmental monitoring arrangements. An external SEA authority, distinguished from the planning one, seems thus abler to ensure a full consideration of the environmental issues in plan making; conversely, a high degree of subsidiarity seems to lead to laxer assessments and more watered down environmental prescriptions. The dialectical contraposition of two distinct bodies seems to ensure a stricter scrutiny of the environmental impacts of the plan and adds authority and credibility to the whole SEA process.

Such results could be interpreted also in a different way, namely that under the subsidiary model the closer relation between the planning body and the SEA Authority leads to a better consideration of environmental impacts from the outset of the planning process, so that less modifications are required afterwards. The content analysis of planning documents we carried out, however, did not show any evident qualitative difference in the environmental content of the examined plans in the two different SEA systems, so in principle the environmental performance of the plans before the issuing of the Reasoned Opinion can be considered comparable. This is supported also by the in-depth analysis of the four case studies. Furthermore, at least for Italy, previous studies on municipal plans' SEA effectiveness conducted by Italian SEA scholars and practitioners report less effective SEA in regions where the planning and SEA Authority substantially coincide (Pompilio, 2010a, 2010b; Modena and Zangheri, 2010).

Our results are therefore an empirical support to the argument of Fischer and Gazzola (2006), mentioned in Section 1. They far-sighted prevision was that under the planning frame in Lombardy, municipalities would self-approve their own plans and related SEA, without any proper independent checks, warning that this would lead to lack of accountability. Given the similarity between the two systems, such considerations can be extended to Spain as well.

Overall, our findings indicate that the cons of the subsidiary model prevail on the potential pros in the examined contexts and that there might be an inherent tension between the advocated adaptability and flexibility of SEA and the need for accountability. We are not arguing that similar considerations apply to all SEA systems around the world: in cases where adequate context conditions are in place, as those listed by Fischer and Gazzola (2006), these two criteria might not conflict. So, a similar research in different countries may produce different resulst. However, reports on SEA effectiveness in systems that are considered more mature than the Italian and Spanish ones showed mixed results. For instance in Canada, Noble (2009) reported that overall SEA had limited influence over, or contribution to, plans' development or downstream actions and that out of 10 examined cases, only five clearly demonstrated assurance of impartiality and independence of the assessment and review process. Lights and shadows were also reported by Fischer (2010) in the UK and by Weiland (2010) in Germany. Overall, this would point to the importance of investigating whether there is a relation between shortcomings in SEA and the context conditions in terms of flexibility, accountability and external check in different SEA systems.

Finally, some considerations on the advantages and disadvantages of the approach used in this research are useful. As argued in the introduction, the clear advantage in examining the Reasoned Opinion lies in the fact that in allows identifying the changes made to a plan, which are an unequivocal results of the SEA process. This decrease the risk of subjective interpretation when reading for example the Environmental Reports. However, a certain amount of subjectivity is inevitable under this approach too, as in all methods entailing the classification and systematization of complex, written texts into a defined number of categories. For instance, the definition of minor and major changes, although based as much as possible on a common and agreed definition, incorporate a certain degree of subjectivity as well. Overall, however, we think that our approach maintains the level of subjectivity acceptable and enable eliciting relevant information on SEA's substantial effectiveness.

6. Conclusions

One of the criteria that should guide the evaluation of SEA effectiveness is the environmental performance of the object it is applied to, i.e. the final plan or program. In this paper, we addressed this issue within the field of urban planning in Italy and Spain. These two countries implemented the SEA Directive by providing for an SEA Authority, distinct from the planning Authority, interacting with the latter in a dialectical way and with the power to require changes to the plan through the Reasoned Opinion, a legally binding statement. Through the examination of a sample of urban plans and related Reasoned Opinion, complemented with an in-depth analysis of four case studies, we conclude that the such SEA arrangement strongly influences the SEA outcomes in terms of environmental contents and performance of the final urban plans. The environmental assessment carried out by planning authority on their own - the results of which are reported in the Environmental Report – is not considered sufficient in providing for adequate consideration of the environmental factors in urban plans, and further changes were almost always required. However, we also demonstrated that the relevance of the required changes is related to the degree of independence of the SEA Authority from the planning authority. When the two authorities tend to coincide or be close and politically dependent from the same municipal council, the environmental scrutiny of the plans seems laxer as reflected by the requests of changes.

Overall, we conclude that in the Italian and Spanish contexts there seems to be a tension between the need for SEA to flexibly adapt to the existing decision-making process and the accountability criteria. An external SEA Authority is needed to empower and add credibility and effectiveness to the SEA process, as the environmental assessment carried out internally by planning bodies does not guarantee a full and appropriate consideration of all the environmental aspects and the plan's impacts. However, to improve effectiveness, our results suggest that such an Authority should be clearly separated and independent from the planning one, and possibly be established at a higher level in the governance hierarchy (e.g. Province or Region).

Acknowledgments

The authors received no founding for carrying out the research. We thank three anonymous reviewers for their useful comments.

References

Acharibasam, J.B., Noble, B.F., 2014. Assessing the impact of strategic environmental assessment. Impact Assess. Proj. Appr. 32 (3), 177–187.
Bina, O., 2003. Re-conceptualizing strategic environmental assessment: theoretical overview and case study from Chile. Newnham College, University of Cambridge, United Kingdom.
Bina, O., Jing, W., Brown, L., Partidário, M.R., 2011. An inquiry into the concept of SEA effectiveness: towards criteria for Chinese practice. Environ. Impact Assess. Rev. 31 (6), 572–581.
Bond, A., Morrison-Saunders, A., Howitt, R., 2013. Framework for Comparing and Evaluating Sustainability Assessment Practice. Taylor & Francis Group, Routledge, pp. 117–131.
Bragagnolo, C., Geneletti, D., Fischer, T.B., 2012. Cumulative effects in SEA of spatial plans — evidence from Italy and England. Impact Assess. Proj. Appr. 30 (2), 100–110.
Buckley, R., 2000. Strategic environmental assessment of policies and plans: legislation and implementation. Impact Assess. Proj. Apprais. 18 (3), 209–215. https://doi.org/10.3152/147154600781767439.
Cashmore, M., Richardson, T., 2013. Power and environmental assessment: introduction to the special issue. Environ. Impact Assess. Rev. 39, 1–4.

Cashmore, M., Richardson, T., Hilding-Ryedvik, T., Emmelin, L., 2010. Evaluating the effectiveness of impact assessment instruments: theorising the nature and implications of their political constitution. Environ. Impact Assess. Rev. 30 (6), 371–379.
Chanchitpricha, C., Bond, A., 2013. Conceptualising the effectiveness of impact assessment processes. Environ. Impact Assess. Rev. 43, 65–72.
Connelly, S., Richardson, T., 2005. Value-driven SEA: time for an environmental justice perspective? Environ. Impact Assess. Rev. 25 (4), 391–409. https://doi.org/10.1016/j.eiar.2004.09.002.
Dalkmann, H., Jiliberto Herrera, R., Bongardt, D., 2004. Analytical strategic environmental assessment (ANSEA) developing a new approach to SEA. Environ. Impact Assess. Rev. 24 (4), 385–402. https://doi.org/10.1016/j.eiar.2003.10.021.
Fischer, T.B., 2010. Reviewing the quality of strategic environmental assessment reports for english spatial plan core strategies. Environ. Impact Assess. Rev. 30 (1), 62–69. https://doi.org/10.1016/j.eiar.2009.04.002.
Fischer, T.B., Gazzola, P., 2006. SEA effectiveness criteria-equally valid in all countries? The case of Italy. Environ. Impact Assess. Rev. 26 (4), 396–409.
Fischer, T.B., Onyango, V., 2012. Strategic environmental assessment-related research projects and journal articles: an overview of the past 20 years. Impact Assess. Proj. Appr. 30 (4), 253–263.
Gauthier, M., Simard, L., Waaub, J.-., 2011. Public participation in strategic environmental assessment (SEA): critical review and the quebec (canada) approach. Environ. Impact Assess. Rev. 31 (1), 48–60. https://doi.org/10.1016/j.eiar.2010.01.006.
Gazzola, P., Jha-Thakur, U., Kidd, S., Peel, D., Fischer, T., 2011. Enhancing environmental appraisal effectiveness: towards an understanding of internal context conditions in Organisational learning. Plann. Theory Pract. 122, 183–204. https://doi.org/10.1080/14649357.2011.581008.
Geneletti, D., 2015. Research in strategic environmental assessment needs to better address analytical methods. J. Environ. Assess. Policy Manag. 17 (01), 1550014.
Geneletti, D., Biasiolli, A., Morrison-Saunders, A., 2017. Land take and the effectiveness of project screening in environmental impact assessment: findings from an empirical study. Environ. Impact Assess. Rev. 67, 117–123.
Hilding-Rydevik, T., Bjarnadóttir, H., 2007. Context awareness and sensitivity in SEA implementation. Environ. Impact Assess. Rev. 27 (7), 666–684.
IAIA (International Association for Impact Assessment), 2002. SEA performance criteria. IAIA Special publication series 1. http://www.iaia.org/publications-resources/downloadablepublications.aspx.
IEMA (Institute of Environ. Manag. and Assessment), 2005. Strategic Environmental Assessment Environmental Report Review Criteria. Institute of Environ. Manag. and Assessment, Lincoln.
Jackson, T., Illsley, B., 2007. An analysis of the theoretical rationale for using strategic environmental assessment to deliver environmental justice in the light of the Scottish environmental assessment act. Environ. Impact Assess. Rev. 27 (7), 607–623.
Jha-Thakur, U., Gazzola, P., Peel, D., Fischer, T.B., Kidd, S., 2009. Effectiveness of strategic environmental assessment-the significance of learning. Impact Assess. Proj. Appr. 27 (2), 133–144.
Kørnøv, L., Thissen, W.A.H., 2000. Rationality in decision- and policy-making: implications for strategic environmental assessment. Impact Assess. and Proj. Apprais. 18, 191–200. https://doi.org/10.3152/147154600781767402.
Li, W., Zhao, Y., 2015. Bibliomatric analysis of global environmental assessment research in a 20-year period. Environ. Impact Assess. Rev. 50 (1), 158–166.
Loomis, J.J., Dziedzic, M., 2018. Evaluating EIA systems' effectiveness: a state of the art. Environ. Impact Assess. Rev. 68, 29–37.
McLauchlan, A., João, E., 2012. The inherent tensions arising fromattempting to carry out strategic environmental assessments on all policies, plans and programmes. Environ. Impact Assess. Rev. 36, 23–33.
Meuleman, L., 2015. Owl meets beehive: how impact assessment and governance relate. Impact Assess. Proj. Appr. 30, 4–15.
Modena, P., Zangheri, P., 2010. Piani urbanistici e VAS. Efficacia del papere motivato in Veneto. [urban plans and SEA. The effectiveness of the reasoned opinion in Veneto]. In Pompilio M, (ed.) L'Autoritá competente nella VAS Dei piani comunali, parte seconda [*The SEA Competent Authority of municipal plans, second part*]. Valutazione Ambientale 18, 23–25.
Monteiro, M.B., Partidário, M.R., 2017. Governance in strategic environmental assessment: lessons from the Portuguese practice. Environ. Impact Assess. Rev. 65, 125–138.
Nitz, T., Brown, L., 2001. SEA must learn how policy making works. J. Environ. Assess. Policy Manag. 3, 329–342. https://doi.org/10.1142/S146433320100073X.
Noble, B.F., 2004. A state-of-practice survey of policy, plan, and program assessment in Canadian provinces. Environ. Impact Assess. Rev. 24, 351–361.
Noble, B.F., 2009. Promise and dismay: the state of strategic environmental assessment systems and practices in Canada. Environ. Impact Assess. Rev. 29, 66–75.
Nykvist, B., Nilsson, M., 2009. Are impact assessment procedures actually promoting sustainable development? institutional perspectives on barriers and opportunities found in the swedish committee system. Environ. Impact Assess. Rev. 29 (1), 15–24. https://doi.org/10.1016/j.eiar.2008.04.002.
OECD (Organization for Economic Cooperation and Development), 2007. Applying Strategic Environmental Assessment-Good Practice Guidance for Development Co-Operation. OECD, Paris.
Partidario, M.R., 1996. Strategic environmental assessment: key issues emerging from recent practice. Environ. Impact Assess. Rev. 16, 31–55. https://doi.org/10.1016/0195-9255(95)00106-9.
Partidário, M.R., 2000. Elements of an SEA framework—improving the added-value of SEA. Environ. Impact Assess. Rev. 20 (6), 647–663.
Partidario, M.R., 2007. Strategic Environmental Assessment Good Practices: Methodological Guidance. Portuguese Environment Agency, Lisbon.
Pompilio, M., 2010a. (ed.) L'Autoritá competente nella VAS Dei piani comunali, parte seconda [*The SEA Competent Authority of municipal plans, second part*]. Valutazione Ambientale 18, 23–35.
Pompilio, M., 2010b. (ed.) L'Autoritá competente nella VAS Dei piani comunali, prima parte [*The SEA Competent Authority of municipal plans, first part*]. Valutazione Ambientale 17, 27–45.
Rega, C., 2013. Ecological compensation in spatial planning in Italy. Impact Assess. Proj. Appr. 31 (1), 45–51.
Rega, C., Bonifazi, A., 2014. Strategic environmental assessment and spatial planning in Italy: sustainability, integration and democracy. J. Environ. Plann. Manag. 57 (9), 1333–1358.
Retief, F., 2007. A performance evaluation of strategic environmental assessment (SEA) processes within the South African context. Environ. Impact Assess. Rev. 27, 84–100.
Stone, A.A., Bachrach, C.A., Jobe, J.B., Kurtzman, H.S., Cain, V.S., 1999. The Science of Self-Report: Implications for Research and Practice. Psychology Press.
Therivel, R., 2004. Strategic Environmental Assessment in Action. Earthscan, London.
Therivel, R., Christian, G., Craig, C., Grinham, R., Mackins, D., Smith, J., Sneller, T., Turner, R., Walker, D., Yamane, M., 2009. Sustainability-focused impact assessment: English experiences. Impact Assess. Proj. Appr. 27 (2), 155–168.
van Buuren, A., Nooteboom, S., 2009. Evaluating strategic environmental assessment in the Netherlands: content, process and procedure as indissoluble criteria for effectiveness. Impact Assess. Proj. Appr. 27 (2), 145–154.
Walker, G., 2010. Environmental justice, impact assessment and the politics of knowledge: the implications of assessing the social distribution of environmental outcomes. Environ. Impact Assess. Rev. 30 (5), 312–318.
Walker, H., Sinclair, J., Spaling, H., 2014. Public participation in and learning through SEA in Kenya. Environ. Impact Assess. Rev. 45, 1–9.
Wallington, T., 2002. Civic Environmental Pragmatism: A Dialogue Framework for Strategic Environmental Assessment. Institute for Sustainability and Technology Policy. Murdoch University, Western Australia.
Wang, H., Bai, H., Liu, J., Xu, H., 2012. Measurement indicators and an evaluation approach for assessing strategic environmental assessment effectiveness. Ecol. Indic. 23, 413–420. https://doi.org/10.1016/j.ecolind.2012.04.021.
Zhang, J., Christensen, P., Kørnøv, L., 2013. Review of critical factors for SEA implementation. Environ. Impact Assess. Rev. 38, 88–98.