

Determinants of SEA effectiveness: an empirical investigation over municipal spatial planning in Sardinia

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Abstract

The late formal tradition of strategic environmental assessment (SEA) European Directive into the Italian planning system has so far induced a variety of behaviour of administrative bodies and planning agencies involved. In Italy and Sardinia, a new approach to landscape planning is characterizing spatial planning practice from the regional to the municipal level. Currently municipalities are adjusting their master plan to the prescriptions of the regional landscape planning instrument (in Italian, Piano Paesaggistico Regionale, PPR), according to processes that have to be integrated with a proper SEA development. With respect to this background, the aim of this paper is to assess the level of SEA implementation on the master plans of Sardinia six years after the approval of the PPR. The first results show that many municipalities are not provided with a master plan (in Italian, Piano Urbanistico Comunale, PUC) and they have in force just an old planning tool. Moreover, just some municipalities have adapted the PUC to the PPR carrying out a SEA process.

Introduction

Italy has acknowledged the European Directive 2001/42/CE (Directive) about the introduction of strategic environmental assessment (SEA) through a series of legislative decrees published from

2006 to 2010. These laws state that SEA must be applied to plans and programs likely to affect the environment and, in particular, interesting given sectors including spatial planning. The Autonomous Region of Sardinia (Region) has acknowledged the Directive by means of two acts approved in 2008 and 2012.

In 2006, the Region has approved a Regional Landscape Plan (in Italian, Piano Paesaggistico Regionale, PPR) constructed according to the Legislative Decree (LD) 42/2004 concerning the code over cultural goods and landscape (Italian Regulation, 2004). The PPR is the main regional landscape planning instrument and it is directed to the protection, valorisation, and promotion of sustainable transformations. The PPR is a spatial coordinator plan, as it indicates guidelines, which need to be implemented by municipal master plan (in Italian, Piano Urbanistico Comunale, PUC). The process of adjustment of the PUC to PPR implies that a SEA procedure is developed in integration with the construction, discussion, and approval of that planning tool.

With respect to this background, the aim of this paper is to assess the level of SEA implementation on the master plans of Sardinia six years after the approval of the PPR.

The paper includes the following arguments. In the next section, the SEA practice context is described, while in the third section some key SEA critical issues are selected and illustrated. In the fourth section, the on-line survey is introduced and referred to the critical issues. In the fifth section, the preliminary results of the survey are shown. In the last section, conclusion is presented.

Materials and methods

SEA implementation on master plans in Sardinia, Italy

Contemporary planning practice in Sardinia is characterized by the design of tools belonging to the last generation of landscape planning instruments. The philosophy of these tools obeys the European Landscape Convention acknowledged in Italy through the LD 42/2004 concerning regulations over cultural goods and landscape (De Montis and Caschili, 2012). In 2006, the Region has approved the PPR and opened a process characterized by the revision of PUCs according to prescriptions and guidelines of the PPR. The adjustment to the PPR is signed by the review of general and special constraints, which represent limitation of property rights and stay in force until master plan design is completed (Aleo, 2012). The first constraints derive from spatial limitations and are imposed by law. The second ones affect goods declared of exceptional importance by means of specific regional administrative acts.

Some authors have pointed out weaknesses and pitfalls. Zoppi (2008) observes how the Region rules over the remaining public bodies according to an inverted subsidiary approach, where local agencies are shadowed by top down hierarchical control processes. In the case of the adjustment of the PUC to the PPR, the municipality plays a marginal role, with respect to planning assumptions and final choices. Deplano and De Montis (2008)

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point out a contradiction: on one side, the PPR was approved without SEA, on the other, provincial and municipal landscape planning instruments must be coherent to PPR and subject to SEA.

There is not an organic regulation about SEA implementation of PUCs. The Region has approved so far two directives (Italian acronym DGR, Deliberazione Giunta Regionale) concerning environmental impact assessment and SEA implementation of plans and programs (RAS, 2008, 2012). The acts constitute the acknowledgement of the decrees approved by Italy about the receipt of the Directive (Italian Regulation, 2006, 2008, 2010).

Municipal spatial planning in Sardinia is regulated by Regional Law (RL) 45/1989 concerning land use and protection (RAS, 1989). According to RL 45/1989, the PUC establishes spatial development of a town and its surrounding environment mostly through zoning.

In 2004, RL 45/1989 has been integrated with the publication of RL 8/2004, concerning the institution and management of the PPR (RAS, 2004). According to RL 8/2004, municipalities should have adjusted their PUC to the PPR within one year from the approval of it. Besides, a SEA procedure should have been developed within the municipal master planning process, and the Region has indicated a path for SEA implementation of PUCs through Guidelines (RAS, 2009).

Only a few municipalities have developed SEA processes in a fairly homogeneous pattern. By contrast, the remaining municipalities have delayed their adhesion to the adjustment process. In front of this complex scenario, an analysis of the status of the SEA implementation is useful, as it enucleates concepts recognized as key issues in the international literature. In the next section, these issues are introduced and referred to a specific state of the art summary.

Key issues for a survey on SEA implementation

Scientific literature on SEA effectiveness is very rich. A general concept is that it is useful to measure SEA effectiveness and efficiency by means of indicators able to assess the performance of SEA processes in quali-quantitative terms. Fischer and Gazzola (2006) propose for Italian SEA practice a list of criteria belonging to two groups: the first attains the institutional and participative scenario; the second one reliability and control of focussed, iterative, flexible and informed processes. Jiricka and Pröbstl (2008) study SEA implementation on municipal master planning in alpine states. They focus on these SEA stages: screening, scoping, Environmental Report, consultation, and follow-up. Noble (2009) examines the Canadian SEA system adopting 15 criteria grouped into three areas under these concepts: SEA system, process, and outcomes. De Montis (2013) studies SEA implementation within provincial strategic spatial planning in Italy by developing two questionnaires about general and special aspects.

The focus is now directed to some key issues that are recognized as crucial for SEA implementation on Sardinian municipal master planning (see Table 1): i) general context, ii) participation, transparency and consensus, iii) quality, and iv) monitoring.

With reference to the general context, Hilding-Rydevik and Bjarnadóttir (2007) analyse the relation between context and SEA, and

detect a special link connecting context awareness and sensibility to successful SEA implementation in northern European countries. Wirutskulshai *et al.* (2011) examine the recent SEA introduction in Thailand, where traditional top-down approach to spatial planning, the limitation to public participation, and the institutional and cultural context have so far minimized the efficacy of environmental assessment and its influence on development planning.

As far as participation, transparency, and consensus are concerned, Rauschmayer and Risse (2005) develop on a criteria list introduced by Wittmer *et al.* (2006) and propose a framework for the evaluation of conflict resolution strategies in SEA processes. This framework includes criteria referred to the following issues: information, legitimacy, social dynamics, and public participation costs. D'Auria and Ó Cinnéide (2009) analyse SEA integration in development plan construction in the case of Kilrush, Ireland. These authors stress that a clear responsibility attribution to stakeholders enhances their awareness of environmental concerns at hand and encourages decision making grounded on consensus building. Van Buuren and Nooteboom (2010) develop two case studies in The Netherlands and investigate SEA success factors, which help producing collaborative governance processes. These conditions attain the following issues: agreement on the ambitions, consensus about the interpretation, acceptance of facts, flexibility, synergy between acceptance of facts and formation of wishes, development of new roles, and formulation of new requirements. Gauthier *et al.* (2011) refer to the link between spatial planning and public participation in Québec. In Canada, SEA practice is flexible and loosely regulated, and requires an agreement about the decisional process and public participation schedule and methods. Participation is relevant in two major SEA stages: scoping and Environmental Report drafting; but it is crucial also during final decision making and follow-up.

With respect to SEA quality, Bonde and Cherp (2000) measure the quality of the Environmental Report of six spatial plans in UK and Sweden by means of an assessment package including 70 relevant themes grouped into four domains: description of the spatial plan, environment, and starting conditions; identification and valuation of main impacts; alternatives, mitigation strategies, and monitoring; results' communication. Thérivel and Minas (2002) develop on the measurement of SEA efficiency and the identification of the following four main factors: responsible authorities, stages and schedule, resources, and documentation. Authors find that crucial SEA implementation determinants are: team's competences in sustainability issues, and SEA timing. Retief (2007) studies SEA implementation quality in South Africa adopting performance indicators grouped into five areas: context, sustainability, participation, pro-action, and efficiency. Fischer (2010) evaluates the Environmental Report of 117 spatial plans in UK, by means of an evaluation package including 43 indicators clustered into six sections: description of the environment and the spatial plan, SEA integration, illustration of key issues, determination of impacts' intensity, consultation, recommendation on the alternatives, and monitoring. Jie Zhang *et al.* (2013) detect critical factors and stages, which influence SEA implementation and performance. According to these

Table 1. Key issues and scientific literature on SEA.

	Key issues	Reference
1	General context	Hilding-Rydevik and Bjarnadóttir (2007), Wirutskulshai <i>et al.</i> (2011)
2	Participation, transparency and consensus	Rauschmayer and Risse (2005), Wittmer <i>et al.</i> (2006), d'Auria and Ó Cinnéide (2009), Van Buuren and Nooteboom (2010), Gauthier <i>et al.</i> (2011)
3	Quality	Bonde and Cherp (2000), Thérivel and Minas (2002), Fischer (2010), Retief (2007), van Doren <i>et al.</i> (2013), Zhang <i>et al.</i> (2013)
4	Monitoring	Hanusch and Glasson (2008)

authors, SEA schedule includes always steps belonging to the following five arenas: Pre-SEA, Preparing the ground, Assess and protect, Wrap it up, and Post SEA. Van Doren *et al.* (2013) measure SEA efficiency, with reference to two key concepts: conformance and performance.

As far as monitoring is concerned, Hanusch and Glasson (2008) explore the patterns of follow-up activities in the context of spatial planning in UK and Germany. The study consists of an exam of Environmental Reports about regional spatial strategies and experts' interviews. The authors focus on the following issues concerning follow-up: reasons of activation, processes to be monitored, responsible bodies, management, timing, and expected results.

Managing the survey: a questionnaire

In this section, the focus is on the design of a user friendly on-line tool that includes sections concerning SEA critical issues drawn from the scientific literature. De Montis (2013) has already experimented on-line services able to support an efficient harvest of information. Google Docs™ (Google Inc., Mountain View, CA, USA) was used as platform for the implementation of the questionnaire.

After three years of experience with on-line questionnaires, in this study we have selected the second generation architecture of Google Docs™ documents, *i.e.* Google Drive. In this way, the database obtained describes scenarios, which can be confronted with international SEA practice. The questionnaire includes four parts corresponding to the themes recognized by international literature as key issues (see Table 2). Questions are directed to obtain closed answers with possible integration in a free text box.

Results

Questionnaire outcomes

In this section, we present the results of the questionnaire. The questionnaire has been submitted to officials belonging to municipalities involved in the adjustment of the PUC to PPR. As the PPR is active

on the first homogeneous coastal domain, only a subset of 196 municipalities is interested (see Figure 1). This section includes two subsections: the first reports on a preliminary screening of the municipalities involved, while the second on the details of the answers provided by a restricted number of municipalities.

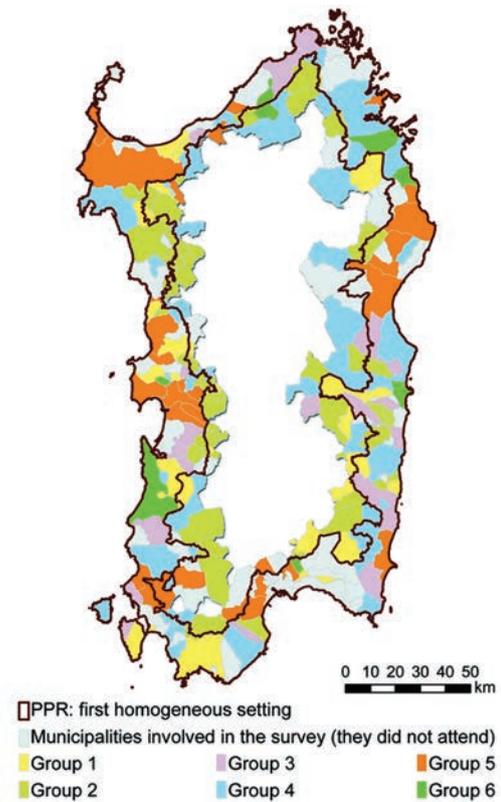


Figure 1. The municipalities aggregated into six groups.

Table 2. Key issues and questions included in the questionnaire on SEA of Sardinian master plans.

Key issues	Questions
1 General context	1. According to which national regulations is the SEA process being (or has been) developed? 2. According to which regional regulations is the SEA process being (or has been) developed? 3. Were (are) the resources adequate to support a SEA process?
2 Participation, transparency and consensus	4. Which competent bodies have been involved? 5. Which are the measures or tools adopted to encourage and stimulate public participation? 6. Which communication instruments have been (is being) used to convey public observations? 7. Which are the main concerns covered during consultation? 8. Which communication instruments have been adopted to disseminate the results? 9. What is your judgement on the time span allowed by law for consultation?
3 Quality	10. Does the plan clearly take into account environmental sustainability concerns? 11. In which stage of the planning process has SEA been developed? 12. Have realistic and well defined master plan's alternatives been considered? 13. Which impacts have been identified, described, and evaluated? 14. Is the controlling authority independent from the proceeding authority (i.e. belonging to another administration)?
4 Monitoring	15. Has the opportunity to monitor the effects of the master plan been considered since the SEA early stages? 16. Is a monitoring plan already active? 17. Have specific guidelines been followed in drafting the monitoring plan? 18. Is the budget sufficient to cover the monitoring plan? 19. Have subjects and bodies responsible for monitoring been identified? 20. Are already available instruments, such as the observatory of spatial transformation, being adopted during the monitoring stage?

Preliminary screening

With respect to 196 municipalities contacted, 158 have replied. Phone interviews have revealed that some municipalities showed similar characteristics with regard to issues related to local land use planning. Hence, we have conceived the idea to group those municipalities who had a similar situation. Thus, municipalities can be clustered into six groups, according to master plan type in force, adjustment to PPR process progress, SEA progress, and interview completion (see Table 3).

Group 1 includes municipalities, which are in the early stages of the PUC design in adjustment to the PPR, and are in the early stages of SEA process. Group 2 embraces municipalities where a PUC is in force, but neither PPR adjustment nor SEA process has started. Group 3 includes municipalities where a PUC is in force, and SEA has progressed to the scoping phase. Group 4 clusters municipalities still have a Programma di Fabbricazione, PdF, *i.e.* Building program (a master plan older and with much simpler contents than the PUC) and/or where an old Piano Regolatore Generale, PRG, *i.e.* General Regulatory Plan, the Italian general release of the PUC, is in force. In these cases, PUC design process has been delayed or impeded by many reasons, such as external shocks (natural disasters), and illegal and unauthorized building. In some cases, PUC design process is in the early stages or municipalities have adopted a PUC, but a PdF or PRG is still in force. Group 5 includes municipalities where the PUC adjustment to PPR and its SEA (usually with Environmental Report completed) processes are being finalized and normal procedural stages are on course: adjustment to comments elaborated by RAS, coherence assessment to be performed by RAS, observation period, and SEA assessment by the competent authority. Group 5 also embraces municipalities which have adopted or approved a PUC and developed completely (or nearly so) its SEA. So, the questionnaire has been administered to the municipalities within group 5. We have put municipalities having filled in the questionnaire within group 6: in such cases, officials have totally or partially completed the questionnaire.

Municipalities belonging to groups 1, 2, 3, and 4 (78% of the total), not being at a sufficiently advanced SEA progress, have not been asked to complete the on-line questionnaire.

The details of the answers

In this section, we provide the reader with the details of the answers of municipalities. Thirty-five municipalities have been invited to fill in the questionnaire and just eight have collaborated. This low level of participation is due to a number of factors like unavailability of municipal officers, due to other urgent commitments, and lack of incentive (questionnaire compilation occurs on voluntary basis, without any remuneration).

In the following sections, we develop on the answers following the key issues of the questionnaire.

Context

In three cases, municipalities have referred SEA implementation to LD 152/2006 updated to LD 4/2008: it has more precisely defined the rules, making the LD 152/2006 more responsive to the Directive. The remaining municipalities have referred to the changes introduced by LD 128/2010 (see Figure 2).

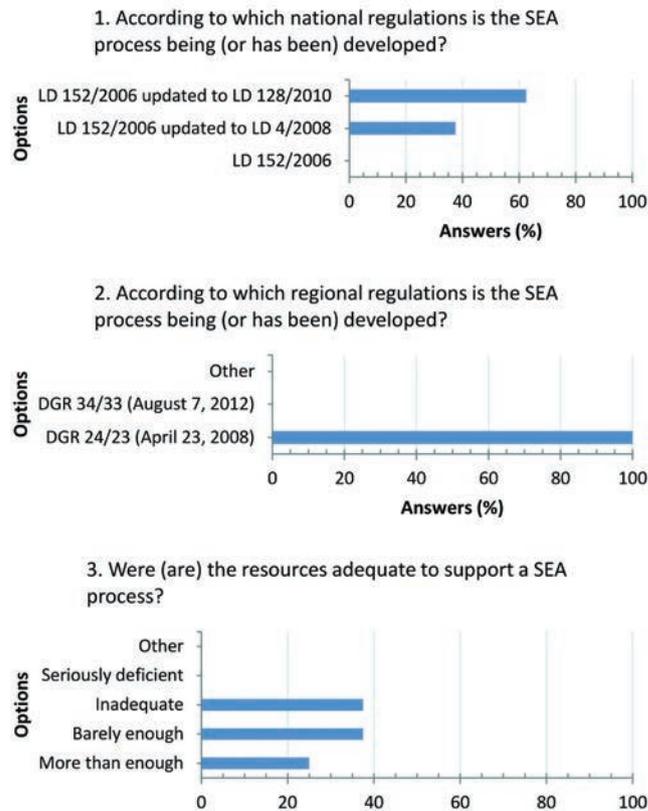


Figure 2. Replies to questions about context: 1. National regulations followed by the municipalities; 2. All municipalities have referred to DGR 24/23 for SEA implementation; 3. Adequateness of financial resources for supporting SEA process.

Table 3. First screening of the municipalities involved.

Group	Number of municipalities	Percentage of contacted municipalities	Master plan instrument in force	Adjustment process of PUC to PPR	SEA progress	On-line survey: interview completed
1	22	14	PUC	Early stages	Not started or very early stages	–
2	44	28	PUC	Not started	Not started	–
3	19	12	PUC	Early stages	Scoping phase	–
4	38	24	PdF, PRG	Not started	Not started	–
5	27	17	PUC	Adopted/completed or nearly so	Environmental report or completed	No
6	8	5	PUC	Adopted/completed or nearly so	Environmental report or completed	Yes

Sardinia does not have a regional law that regulates SEA. With respect to the regional indications, all municipalities have referred to DGR 24/23 issued in 2008.

Finally, municipalities have assessed in different ways the financial resources to carry out the SEA. Three out of eight municipalities believe that the financial resources were insufficient, three barely enough, and two more than enough.

Participation, transparency and consensus

In general, the municipalities have involved almost all the relevant bodies responsible for environmental matters indicated by regional guidelines. Municipalities have always involved the Regional service of environmental sustainability, impact assessment and environmental information systems (Italian acronym SAVI), the corresponding Province and the regional offices for landscape protection (ROLP). Seven municipalities out of eight have involved the Regional agency for environmental protection (Italian acronym ARPAS). Four municipalities have involved management bodies of protected areas (MBPA). In three cases, other actors have been involved, such as the mayors of neighboring municipalities (see Figure 3).

With regard to the instruments used to include the public in the process, the eight municipalities have selected a total of 12 options but none prevails over the others. Public observations have been mainly expressed during meetings.

With reference to nine options selected by the municipalities, the main concern over the public consultation phase refers to time. Problems related to logistics have been considered to be less relevant.

With respect to communication instruments used to disseminate the results, the eight municipalities have selected a total of 11 options. Seven responses have indicated “Documentation on web pages” as the principal tool to inform the public about the results.

Finally, half of the municipalities believes that the time spent in consultations is barely enough.

Quality

Seven out of eight plans have clearly taken into account the goals of environmental sustainability (see Figure 4). In six cases, SEA has been integrated in the early stages of plan preparation. In two cases, it has been integrated in an advanced stage.

Just half of the municipalities have set realistic alternatives with respect to the stated objectives.

All eight municipalities declare to have identified, described and evaluated the direct effects resulting from the adoption of the plan. Indirect effects have been regarded by six municipalities. Half of the municipalities claim to have also described cumulative effects, while just one municipality claims to have also taken into account synergic effects. The controlling authority is always independent from the proceeding authority.

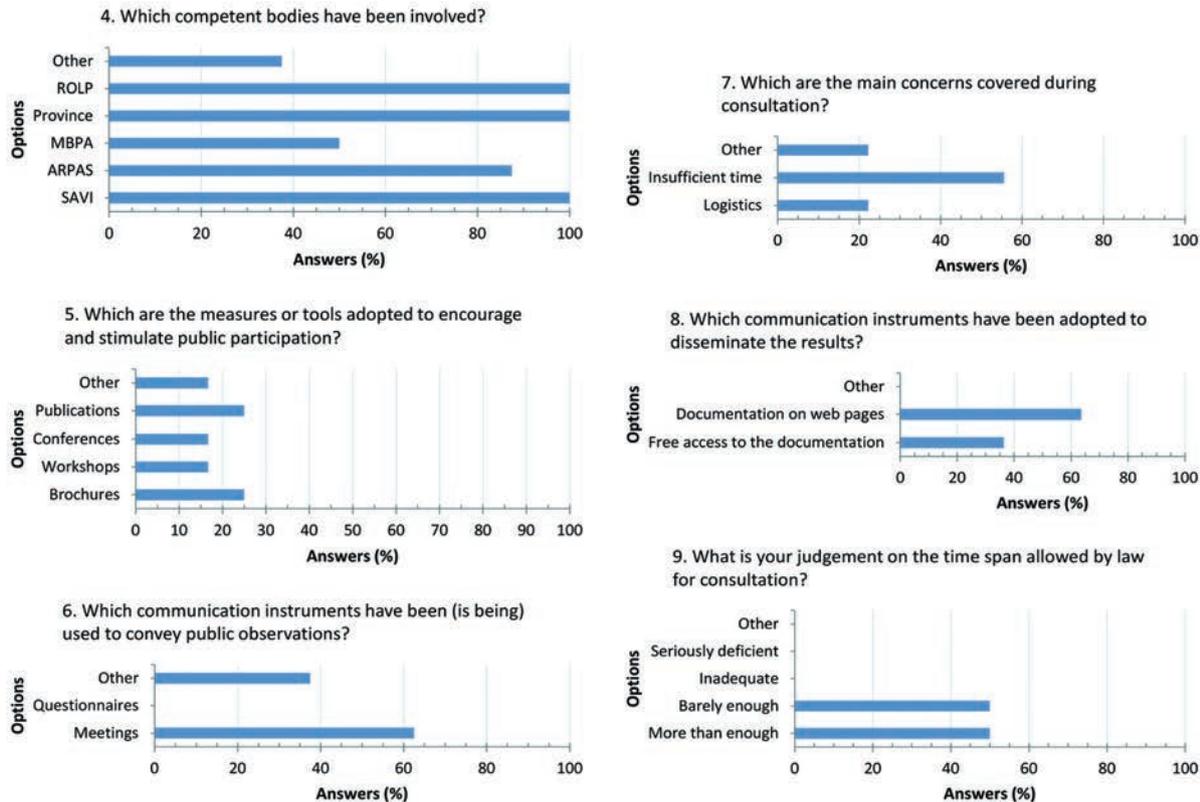


Figure 3. Replies to questions about participation, transparency, and consensus: 4. Competent bodies involved into SEA process; 5. Instruments used to involve the public (question which could be given more answers); 6. Instruments used by the municipalities to convey public observations; 7. The main concerns dealt with during consultation (question which could be given more answers); 8. Communication instruments used by the municipalities to disseminate results (question which could be given more answers); 9. Judgment on the time span allowed by law for consultation.

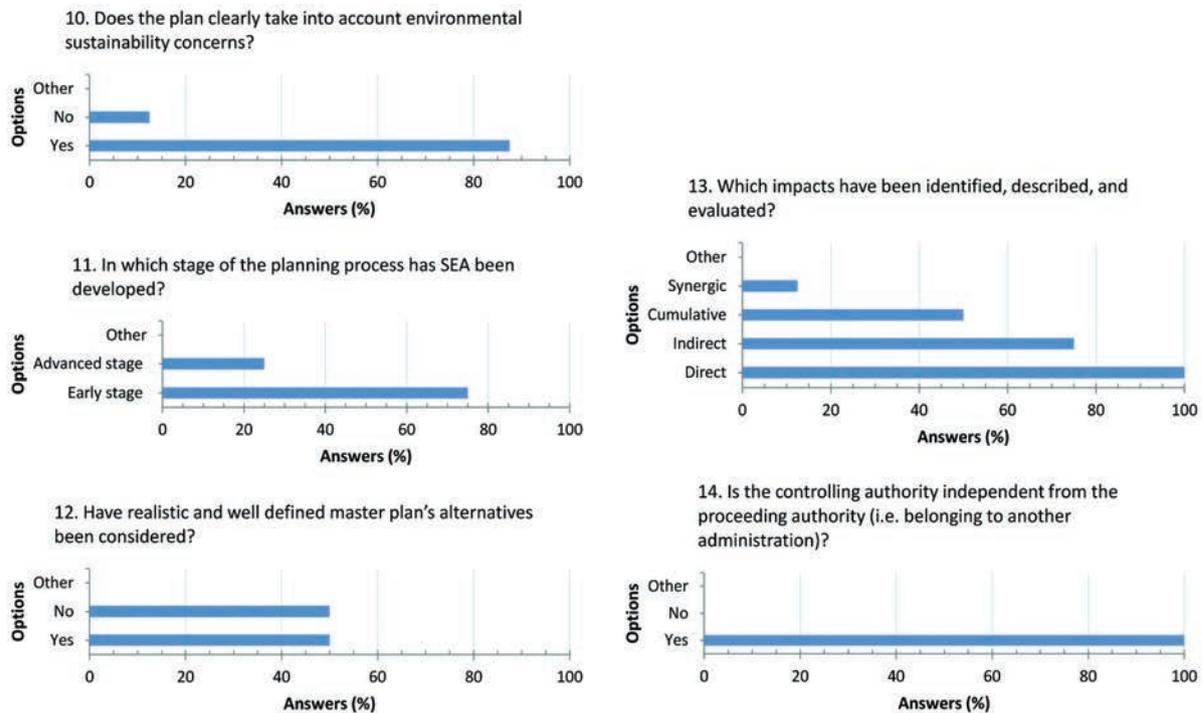


Figure 4. Replies to questions about quality: 10. Environmental sustainability concerns taken into account within plan; 11. Stage in which SEA has been integrated; 12. Master plan's alternatives; 13. Impacts considered; 14. The controlling authority is always independent from the proceeding authority.

Monitoring

With respect to monitoring, most of the municipalities have considered in the scoping phase the ability to track the plan's effects (see Figure 5). In seven out of eight municipalities a monitoring plan is not active yet. Just in three cases, municipalities have followed specific guidelines to elaborate the monitoring plan.

No municipality believes its financial resources are sufficient to carry out the monitoring operations. In five out of eight cases, municipalities

have not identified the subjects who would have taken care of the monitoring; in three cases, existing tools will be used for monitoring.

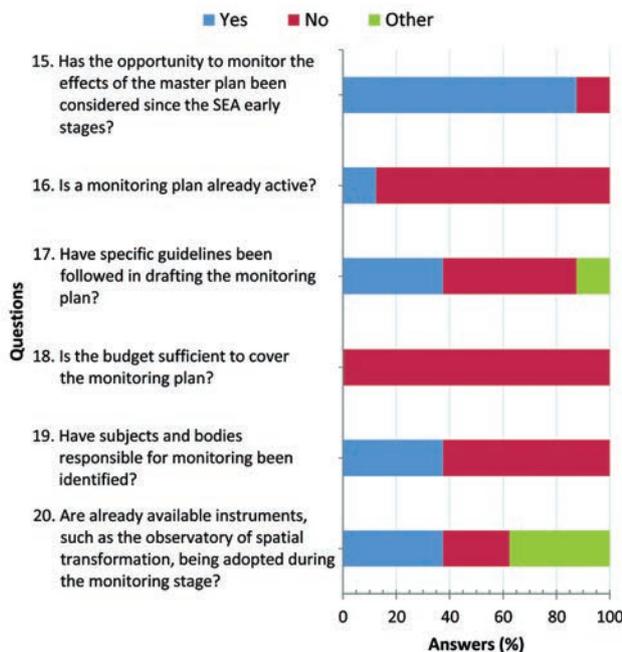


Figure 5. Replies to questions about monitoring within SEA process.

Conclusions

In this paper, the authors discuss a survey about SEA implementation within local master planning, in Sardinia. The main master planning tool, *i.e.* the PUC, is currently subject to renovation in order to adhere to the PPR, Regional Landscape Plan, in force since 2006.

The results of the survey can be analyzed according to two perspectives: the first one relates to the state of local planning, the second relates to SEA implementation at the level of municipal PUCs in coherence with the PPR.

With respect to the first point, results indicate that municipal land use planning still lags behind. Many municipalities involved have an old PdF (or PRG) in force: some of these tools have been approved in the 1980s. Again, many municipalities have approved the PUC, but there is no intention to adapt it to PPR. This is due, in large part, to the absence of political willingness.

With respect to the second point, preliminary results show an overall low level of SEA implementation. Questionnaire responses highlight some critical aspects that are discussed below.

First, contextual aspects regarding SEA procedure have been clarified by national legislation. At the regional level, a law dedicated to SEA still lacks; so far only directives have been issued. Processes of PUC adjustment to the PPR have been delayed because of lack of political interest, and insufficient financial resources.

Second, municipalities have ensured public access to information in a fairly satisfactory way. This is quite a relevant result, since public involvement is a key element in consensus building towards final acceptable decisions.

Third, as far as assessment quality is concerned, almost every municipality has clearly considered in the planning process the environmental sustainability goals. Most municipalities have introduced SEA at the early stages of the planning process. This is crucial, as a lack of adequate consideration of environmental aspects often characterizes SEA processes undertaken at the end of the process. In these cases, SEA is meant as a sort of justification for approving a certain plan, and hardly takes into account environmental matters and stakeholders' opinion. Just half of municipalities claim to have developed other solutions with respect to the plan adopted: it would be interesting to investigate how they have studied other options. This is a very critical aspect of SEA implementation worldwide. With respect to the identification, description and assessment of significant effects resulting from the adoption of the plan, all municipalities claim to have taken into account the direct effects. Sometimes indirect effects have been considered. In some other cases, municipalities have also taken into account the cumulative and synergistic effects. It would be necessary to investigate further to understand how municipalities have been able to consider in the planning process these kind of impacts, as they should be particularly difficult to identify, describe and evaluate. According to the literature, we find that the degree of independence of the competent authority against the proceeding authority helps us to define the quality of a SEA. In our survey, the authorities are always independent: self-evaluation is being avoided.

Finally, although in most cases the municipalities have set a monitoring plan, this tool has not been activated by almost no one. In addition, no municipality has clearly indicated a financial support for this phase and just a few municipalities have identified responsible subjects or bodies. So, monitoring is still one of the critical aspects of the SEA process, even though it incontestably improves understanding of significant effects and early identification of relevant environmental concerns. This may be useful to redirect planning choices, in a continuous adaptive process.

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