

TeMA

Journal of
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This special issue collects a selection of peer-review papers presented at the 8th International Conference INPUT 2014 titled "Smart City: planning for energy, transportation and sustainability of urban systems", held on 4-6 June in Naples, Italy. The issue includes recent developments on the theme of relationship between innovation and city management and planning.

Tema is the Journal of Land use, Mobility and Environment and offers papers with a unified approach to planning and mobility. TeMA Journal has also received the Sparc Europe Seal of Open Access Journals released by Scholarly Publishing and Academic Resources Coalition (SPARC Europe) and the Directory of Open Access Journals (DOAJ).

INPUT 2014

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Smart City

planning for energy, transportation
and sustainability of the urban system

SMART CITY

PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

Special Issue, June 2014

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TeMA

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TeMA. Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of transport, land use and environment. Domains include engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science, and complex systems.

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This special issue of TeMA collects the papers presented at the 8th International Conference INPUT 2014 which will take place in Naples from 4th to 6th June. The Conference focuses on one of the central topics within the urban studies debate and combines, in a new perspective, researches concerning the relationship between innovation and management of city changing.



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EIGHTH INTERNATIONAL CONFERENCE INPUT 2014

SMART CITY. PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

This special issue of TeMA collects the papers presented at the Eighth International Conference INPUT, 2014, titled "Smart City. Planning for energy, transportation and sustainability of the urban system" that takes place in Naples from 4 to 6 of June 2014.

INPUT (Innovation in Urban Planning and Territorial) consists of an informal group/network of academic researchers Italians and foreigners working in several areas related to urban and territorial planning. Starting from the first conference, held in Venice in 1999, INPUT has represented an opportunity to reflect on the use of Information and Communication Technologies (ICTs) as key planning support tools. The theme of the eighth conference focuses on one of the most topical debate of urban studies that combines , in a new perspective, researches concerning the relationship between innovation (technological, methodological, of process etc..) and the management of the changes of the city. The Smart City is also currently the most investigated subject by TeMA that with this number is intended to provide a broad overview of the research activities currently in place in Italy and a number of European countries. Naples, with its tradition of studies in this particular research field, represents the best place to review progress on what is being done and try to identify some structural elements of a planning approach.

Furthermore the conference has represented the ideal space of mind comparison and ideas exchanging about a number of topics like: planning support systems, models to geo-design, qualitative cognitive models and formal ontologies, smart mobility and urban transport, Visualization and spatial perception in urban planning innovative processes for urban regeneration, smart city and smart citizen, the Smart Energy Master project, urban entropy and evaluation in urban planning, etc..

The conference INPUT Naples 2014 were sent 84 papers, through a computerized procedure using the website www.input2014.it . The papers were subjected to a series of monitoring and control operations. The first fundamental phase saw the submission of the papers to reviewers. To enable a blind procedure the papers have been checked in advance, in order to eliminate any reference to the authors. The review was carried out on a form set up by the local scientific committee. The review forms received were sent to the authors who have adapted the papers, in a more or less extensive way, on the base of the received comments. At this point (third stage), the new version of the paper was subjected to control for to standardize the content to the layout required for the publication within TeMA. In parallel, the Local Scientific Committee, along with the Editorial Board of the magazine, has provided to the technical operation on the site TeMA (insertion of data for the indexing and insertion of pdf version of the papers). In the light of the time's shortness and of the high number of contributions the Local Scientific Committee decided to publish the papers by applying some simplifies compared with the normal procedures used by TeMA. Specifically:

- Each paper was equipped with cover, TeMA Editorial Advisory Board, INPUT Scientific Committee, introductory page of INPUT 2014 and summary;
- Summary and sorting of the papers are in alphabetical order, based on the surname of the first author;
- Each paper is indexed with own DOI codex which can be found in the electronic version on TeMA website (www.tema.unina.it). The codex is not present on the pdf version of the papers.

SMART CITY PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM Special Issue, June 2014

Contents

- 1. The Plan in Addressing the Post Shock Conflicts 2009-2014.
A First Balance Sheet of the Reconstruction of L'Aquila** 1-13
Fabio Andreassi, Pierluigi Properzi
- 2. Assessment on the Expansion of Basic Sanitation Infrastructure.
In the Metropolitan Area of Belo Horizonte - 2000/2010** 15-26
Grazielle Anjos Carvalho
- 3. Temporary Dwelling of Social Housing in Turin.
New Responses to Housing Discomfort** 27-37
Giulia Baù, Luisa Ingaramo
- 4. Smart Communities. Social Innovation at the Service of the Smart Cities** 39-51
Massimiliano Bencardino, Ilaria Greco
- 5. Online Citizen Reporting on Urban Maintenance:
A Collection, Evaluation and Decision Support System** 53-63
Ivan Blečić, Dario Canu, Arnaldo Cecchini, Giuseppe Andrea Trunfio
- 6. Walkability Explorer. An Evaluation and Design Support Tool for Walkability** 65-76
Ivan Blečić, Arnaldo Cecchini, Tanja Congiu, Giovanna Fancello, Giuseppe Andrea Trunfio
- 7. Diachronic Analysis of Parking Usage: The Case Study of Brescia** 77-85
Riccardo Bonotti, Silvia Rossetti, Michela Tiboni, Maurizio Tira
- 8. Crowdsourcing. A Citizen Participation Challenge** 87-96
Júnia Borges, Camila Zyngier
- 9. Spatial Perception and Cognition Review.
Considering Geotechnologies as Urban Planning Strategy** 97-108
Júnia Borges, Camila Zyngier, Karen Lourenço, Jonatha Santos

- 10. Dilemmas in the Analysis of Technological Change. A Cognitive Approach to Understand Innovation and Change in the Water Sector** 109-127
Dino Borri, Laura Grassini
- 11. Learning and Sharing Technology in Informal Contexts. A Multiagent-Based Ontological Approach** 129-140
Dino Borri, Domenico Camarda, Laura Grassini, Mauro Patano
- 12. Smartness and Italian Cities. A Cluster Analysis** 141-152
Flavio Boscacci, Ila Maltese, Ilaria Mariotti
- 13. Beyond Defining the Smart City. Meeting Top-Down and Bottom-Up Approaches in the Middle** 153-164
Jonas Breuer, Nils Walravens, Pieter Ballon
- 14. Resilience Through Ecological Network** 165-173
Grazia Brunetta, Angioletta Voghera
- 15. ITS System to Manage Parking Supply: Considerations on Application to the “Ring” in the City of Brescia** 175-186
Susanna Bulferetti, Francesca Ferrari, Stefano Riccardi
- 16. Formal Ontologies and Uncertainty. In Geographical Knowledge** 187-198
Matteo Caglioni, Giovanni Fusco
- 17. Geodesign From Theory to Practice: In the Search for Geodesign Principles in Italian Planning Regulations** 199-210
Michele Campagna, Elisabetta Anna Di Cesare
- 18. Geodesign from Theory to Practice: From Metaplanning to 2nd Generation of Planning Support Systems** 211-221
Michele Campagna
- 19. The Energy Networks Landscape. Impacts on Rural Land in the Molise Region** 223-234
Donatella Cialdea, Alessandra Maccarone
- 20. Marginality Phenomena and New Uses on the Agricultural Land. Diachronic and Spatial Analyses of the Molise Coastal Area** 235-245
Donatella Cialdea, Luigi Mastronardi
- 21. Spatial Analysis of Urban Squares. ‘Siccome Umbellico al corpo dell’uomo’** 247-258
Valerio Cutini

- 22. Co-Creative, Re-Generative Smart Cities.
Smart Cities and Planning in a Living Lab Perspective 2** **259-270**
Luciano De Bonis, Grazia Concilio, Eugenio Leanza, Jesse Marsh, Ferdinando Trapani
- 23. The Model of Voronoi's Polygons and Density:
Diagnosis of Spatial Distribution of Education Services of EJA
in Divinópolis, Minas Gerais, Brazil** **271-283**
Diogo De Castro Guadalupe, Ana Clara Mourão Moura
- 24. Rural Architectural Intensification: A Multidisciplinary Planning Tool** **285-295**
Roberto De Lotto, Tiziano Cattaneo, Cecilia Morelli Di Popolo, Sara Morettini,
Susanna Sturla, Elisabetta Venco
- 25. Landscape Planning and Ecological Networks.
Part A. A Rural System in Nuoro, Sardinia** **297-307**
Andrea De Montis, Maria Antonietta Bardi, Amedeo Ganciu, Antonio Ledda,
Simone Caschili, Maurizio Mulas, Leonarda Dessena, Giuseppe Modica,
Luigi Laudari, Carmelo Riccardo Fichera
- 26. Landscape Planning and Ecological Networks.
Part B. A Rural System in Nuoro, Sardinia** **309-320**
Andrea De Montis, Maria Antonietta Bardi, Amedeo Ganciu, Antonio Ledda,
Simone Caschili, Maurizio Mulas, Leonarda Dessena, Giuseppe Modica,
Luigi Laudari, Carmelo Riccardo Fichera
- 27. Sea Guidelines. A Comparative Analysis: First Outcomes** **321-330**
Andrea De Montis, Antonio Ledda, Simone Caschili, Amedeo Ganciu, Mario Barra,
Gianluca Cocco, Agnese Marcus
- 28. Energy And Environment in Urban Regeneration.
Studies for a Method of Analysis of Urban Periphery** **331-339**
Paolo De Pascali, Valentina Alberti, Daniela De Ioris, Michele Reginaldi
- 29. Achieving Smart Energy Planning Objectives.
The Approach of the Transform Project** **341-351**
Ilaria Delponte
- 30. From a Smart City to a Smart Up-Country.
The New City-Territory of L'Aquila** **353-364**
Donato Di Ludovico, Pierluigi Properzi, Fabio Graziosi
- 31. Geovisualization Tool on Urban Quality.
Interactive Tool for Urban Planning** **365-375**
Enrico Eynard, Marco Santangelo, Matteo Tabasso

- 32. Visual Impact in the Urban Environment.
The Case of Out-of-Scale Buildings** 377-388
Enrico Fabrizio, Gabriele Garnerò
- 33. Smart Dialogue for Smart Citizens:
Assertive Approaches for Strategic Planning** 389-401
Isidoro Fasolino, Maria Veronica Izzo
- 34. Digital Social Networks and Urban Spaces** 403-415
Pablo Vieira Florentino, Maria Célia Furtado Rocha, Gilberto Corso Pereira
- 35. Social Media Geographic Information in Tourism Planning** 417-430
Roberta Floris, Michele Campagna
- 36. Re-Use/Re-Cycle Territories:
A Retroactive Conceptualisation for East Naples** 431-440
Enrico Formato, Michelangelo Russo
- 37. Urban Land Uses and Smart Mobility** 441-452
Mauro Francini, Annunziata Palermo, Maria Francesca Viapiana
- 38. The Design of Signalised Intersections at Area Level.
Models and Methods** 453-464
Mariano Gallo, Giuseppina De Luca, Luca D'acierno
- 39. Piano dei Servizi. Proposal for Contents and Guidelines** 465-476
Roberto Gerundo, Gabriella Graziuso
- 40. Social Housing in Urban Regeneration.
Regeneration Heritage Existing Building: Methods and Strategies** 477-486
Maria Antonia Giannino, Ferdinando Orabona
- 41. Using GIS to Record and Analyse Historical Urban Areas** 487-497
Maria Giannopoulou, Athanasios P. Vavatsikos,
Konstantinos Lykostratis, Anastasia Roukouni
- 42. Network Screening for Smarter Road Sites: A Regional Case** 499-509
Attila Grieco, Chiara Montaldo, Sylvie Ocelli, Silvia Tarditi
- 43. Li-Fi for a Digital Urban Infrastructure:
A Novel Technology for the Smart City** 511-522
Corrado Iannucci, Fabrizio Pini
- 44. Open Spaces and Urban Ecosystem Services.
Cooling Effect towards Urban Planning in South American Cities** 523-534
Luis Inostroza

- 45. From RLP to SLP: Two Different Approaches to Landscape Planning** 535-543
Federica Isola, Cheti Pira
- 46. Revitalization and its Impact on Public. Space Organization A Case Study of Manchester in UK, Lyon in France and Łódź in Poland** 545-556
Jaroslaw Kazimierzczak
- 47. Geodesign for Urban Ecosystem Services** 557-565
Daniele La Rosa
- 48. An Ontology of Implementation Plans of Historic Centers: A Case Study Concerning Sardinia, Italy** 567-579
Sabrina Lai, Corrado Zoppi
- 49. Open Data for Territorial Specialization Assessment. Territorial Specialization in Attracting Local Development Funds: an Assessment. Procedure Based on Open Data and Open Tools** 581-595
Giuseppe Las Casas, Silvana Lombardo, Beniamino Murgante, Piergiuseppe Pontrandolfi, Francesco Scorza
- 50. Sustainability And Planning. Thinking and Acting According to Thermodynamics Laws** 597-606
Antonio Leone, Federica Gobattoni, Raffaele Pelorosso
- 51. Strategic Planning of Municipal Historic Centers. A Case Study Concerning Sardinia, Italy** 607-619
Federica Leone, Corrado Zoppi
- 52. A GIS Approach to Supporting Nightlife Impact Management: The Case of Milan** 621-632
Giorgio Limonta
- 53. Dealing with Resilience Conceptualisation. Formal Ontologies as a Tool for Implementation of Intelligent Geographic Information Systems** 633-644
Giampiero Lombardini
- 54. Social Media Geographic Information: Recent Findings and Opportunities for Smart Spatial Planning** 645-658
Pierangelo Massa, Michele Campagna
- 55. Zero Emission Mobility Systems in Cities. Inductive Recharge System Planning in Urban Areas** 659-669
Giulio Maternini, Stefano Riccardi, Margherita Cadei

- 56. Urban Labelling: Resilience and Vulnerability as Key Concepts for a Sustainable Planning** 671-682
Giuseppe Mazzeo
- 57. Defining Smart City. A Conceptual Framework Based on Keyword Analysis** 683-694
Farnaz Mosannenzadeh, Daniele Vettorato
- 58. Parametric Modeling of Urban Landscape: Decoding the Brasilia of Lucio Costa from Modernism to Present Days** 695-708
Ana Clara Moura, Suellen Ribeiro, Isadora Correa, Bruno Braga
- 59. Smart Mediterranean Logics. Old-New Dimensions and Transformations of Territories and Cites-Ports in Mediterranean** 709-718
Emanuela Nan
- 60. Mapping Smart Regions. An Exploratory Approach** 719-728
Sylvie Occelli, Alessandro Sciuolo
- 61. Planning Un-Sustainable Development of Mezzogiorno. Methods and Strategies for Planning Human Sustainable Development** 729-736
Ferdinando Orabona, Maria Antonia Giannino
- 62. The Factors Influencing Transport Energy Consumption in Urban Areas: a Review** 737-747
Rocco Papa, Carmela Gargiulo, Gennaro Angiello
- 63. Integrated Urban System and Energy Consumption Model: Residential Buildings** 749-758
Rocco Papa, Carmela Gargiulo, Gerardo Carpentieri
- 64. Integrated Urban System and Energy Consumption Model: Public and Singular Buildings** 759-770
Rocco Papa, Carmela Gargiulo, Mario Cristiano
- 65. Urban Smartness Vs Urban Competitiveness: A Comparison of Italian Cities Rankings** 771-782
Rocco Papa, Carmela Gargiulo, Stefano Franco, Laura Russo
- 66. Urban Systems and Energy Consumptions: A Critical Approach** 783-792
Rocco Papa, Carmela Gargiulo, Floriana Zucaro
- 67. Climate Change and Energy Sustainability. Which Innovations in European Strategies and Plans** 793-804
Rocco Papa, Carmela Gargiulo, Floriana Zucaro

- 68. Bio-Energy Connectivity And Ecosystem Services.
An Assessment by Pandora 3.0 Model for Land Use Decision Making** 805-816
Raffaele Pelorosso, Federica Gobattoni, Francesco Geri,
Roberto Monaco, Antonio Leone
- 69. Entropy and the City. GHG Emissions Inventory:
a Common Baseline for the Design of Urban and Industrial Ecologies** 817-828
Michele Pezzagno, Marco Rosini
- 70. Urban Planning and Climate Change: Adaptation and Mitigation Strategies** 829-840
Fulvia Pinto
- 71. Urban Gaming Simulation for Enhancing Disaster Resilience.
A Social Learning Tool for Modern Disaster Risk Management** 841-851
Sarunwit Promsaka Na Sakonnakron, Pongpisit Huyakorn, Paola Rizzi
- 72. Visualisation as a Model. Overview on Communication Techniques
in Transport and Urban Planning** 853-862
Giovanni Rabino, Elena Masala
- 73. Ontologies and Methods of Qualitative Research in Urban Planning** 863-869
Giovanni Rabino
- 74. City/Sea Searching for a New Connection.
Regeneration Proposal for Naples Waterfront Like an Harbourscape:
Comparing Three Case Studies** 871-882
Michelangelo Russo, Enrico Formato
- 75. Sensitivity Assessment. Localization of Road Transport Infrastructures
in the Province of Lucca** 883-895
Luisa Santini, Serena Pecori
- 76. Creating Smart Urban Landscapes.
A Multimedia Platform for Placemaking** 897-907
Marichela Sepe
- 77. Virtual Power Plant. Environmental Technology Management Tools
of The Settlement Processes** 909-920
Maurizio Sibilla
- 78. Ecosystem Services and Border Regions.
Case Study from Czech – Polish Borderland** 921-932
Marcin Spyra
- 79. The Creative Side of the Reflective Planner. Updating the Schön's Findings** 933-940
Maria Rosaria Stufano Melone, Giovanni Rabino

- 80. Achieving People Friendly Accessibility.
Key Concepts and a Case Study Overview** **941-951**
Michela Tiboni, Silvia Rossetti
- 81. Planning Pharmacies: An Operational Method to Find the Best Location** **953-963**
Simona Tondelli, Stefano Fatone
- 82. Transportation Infrastructure Impacts Evaluation:
The Case of Egnatia Motorway in Greece** **965-975**
Athanasios P. Vavatsikos, Maria Giannopoulou
- 83. Designing Mobility in a City in Transition.
Challenges from the Case of Palermo** **977-988**
Ignazio Vinci, Salvatore Di Dio
- 84. Considerations on the Use of Visual Tools in Planning Processes:
A Brazilian Experience** **989-998**
Camila Zyngier, Stefano Pensa, Elena Masala

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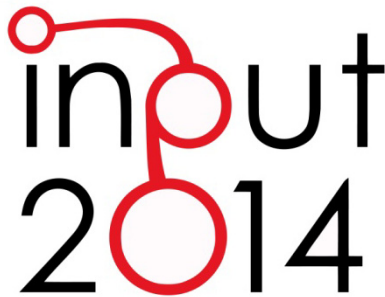
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SEA GUIDELINES

A COMPARATIVE ANALYSIS: FIRST OUTCOMES

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ABSTRACT

The European Directive 2001/42/EC (Directive) has introduced the Strategic Environmental Assessment (SEA), a procedure for assessing the effects of certain plans and programs on the environment. The Directive has been transposed in different ways and times within Europe: member states have frequently drawn up guidelines to facilitate SEA implementation, by adopting different approaches. So far a few studies have been performed to analyze SEA guidelines.

In this paper we aim to analyze key elements of SEA guidelines released by seven European countries in order to evaluate the effectiveness of those documents and SEA implementation. We have found that no SEA guidelines satisfy all key elements we have identified. Based on the latter finding, this work is introductory to a further analysis which aims to characterize SEA guidelines and define a proposal of SEA guidelines for landscape planning in the Italian region of Sardinia.

KEYWORDS

Strategic environmental assessment, European Union, Guidance documents

1 INTRODUCTION

Italy has acknowledged the European Directive 2001/42/EC (Directive) through the legislative decree 152/2006 (Italy 2006), henceforth Environmental Code, which has been subsequently improved by similar legislative decrees in 2008 and 2010 (Italy 2008, 2010).

The degree of SEA implementation within the Italian context has been unequal: good experiences of SEA have been documented mainly in the northern regions of the peninsula (De Montis 2013), but in Southern Italy and, in particular, in Sardinia some difficulties in SEA practice have been documented at the level of municipal spatial planning (De Montis *et al.* 2013). Therefore, there is the need of documents able to steer SEA practice towards the achievement of homogeneous higher quality level. Many countries have so far adopted such documents under a variety of denominations like guidelines, guidance or manuals (henceforth SEA guidelines). With respect to Italy, SEA guidelines have been drawn up in the context of EU Structural Funds 2000-2006 (Italy 1999) and of the Enplan Project (Enplan Project 2004).

The aim of this paper is to scrutinize the guidelines approved by some European countries in order to evaluate the effectiveness of those documents and SEA implementation. We focus on critical points, in the perspective of the design of specific guidelines on SEA implementation in Sardinia for the sector of spatial planning. The study is not intended to establish a ranking or quality benchmarks. It regards instead the relevance of each guideline with respect to issues reported as relevant in the literature. This work has been carried out in three steps: i) literature review on the classification criteria about the structure of the guidelines; ii) identification and selection of guidelines available on-line; iii) comparison of the contents of the selected guidelines with respect to the classification criteria. The arguments of this paper unfold as follows. Section 2 reports the literature review about SEA guidelines, and introduces the key elements emerging in those documents. In Section 3, we explain our classification methodology. In Section 4, we present the results, which are discussed in Section 5. In Section 6, the final conclusions are presented.

2 SEA GUIDELINES CRITICAL ISSUES: A LITERATURE REVIEW

Despite a fairly good practice in the adoption of SEA guidelines, so far only a few studies have scrutinized the effectiveness of those documents. Schijf (2011, 487) argues "that there has been little systematic analysis of the guidance that is available". In this section, we discuss some critical issues emerging from SEA implementation in different contexts, and from drawing up SEA guidelines.

The choice of a particular SEA process depends on the context and level of the policy, plan or program (PPP). At the policy level, it may be appropriate to make a low detailed qualitative assessment. With respect to the evaluation of plans or programs, direct environmental effects are involved and an EIA-based procedure may be invoked (Abaza *et al.* 2004, 93). The availability of SEA guidelines drawn up for specific sectors, organizations, and types of impacts, is useful to promote, or speed up, SEA practice (Thérivel 2004, 208). Schijf (2011, 491) argues that there are good reasons "for making specific guidance material to a given planning system, a certain planning level or particular type of policy, plan or programme" and there are "also solid reasons for developing sector-specific guidance on SEA". Brown and Thérivel (2000) argue that SEA methodology "have to be shaped according to the PPP formulation and decision-making context" and the "techniques, processes, time frames and administrative requirements for implementing SEA need to be tailored closely to the particular circumstances of the PPP under consideration". SEA methodologies are related to issues like "the level at which PPP formulation and decision-making occurs" (Brown and Thérivel 2000), and none of them is directly applicable to any socio-political context or strategic action. Balfors and Schmidtbauer (2002) examine the Swedish SEA guidelines for EU Structural Funds, which "aim to increase

the integration of environmental concerns in the programming process by promoting the application of environmental-objective-led SEA". The guidelines document, developed by the Swedish Environmental Protection Agency, covers different themes ranging from a description of the Structural Fund system to International regulations about sustainable development, from the "SEA as a tool that can provide the programmes with an environmental profile" to "a substantial section on good examples of environmental integration [...]". Balfors and Schmidtbauer (2002) argue that "to achieve a successful implementation of the guidelines, supporting strategies may be needed" which consist, for example, in educational strategies. Diamantini and Geneletti (2004) analyze implementation of SEA in the Autonomous Province of Trento (APT), Italy, where "guidelines to carry out the environmental report [...] were issued and experimentally applied to several sectoral plans", emphasizing both the positive aspects and shortcomings affecting the guidelines and their application. To check how the guidelines were applied in practice, the APT's Mobility Plan was used. According to the authors, a major concern in SEA implementation of a sector plan is the absence of references to a sustainability framework, because that SEA might just be restricted to "a limited subset of environmental issues and indicators, disregarding the synergies and cumulative impacts of concurrent plans". Sheate *et al.* (2004) provide an overview on the implementation of the SEA Directive in the UK with respect to three key issues: legal framework, plans and programmes interested, and the provision of support to practice, like guidance. Sheate *et al.* (2004, 77) list a number of SEA guidance documents in some sectors, and acknowledge that: "[a] key challenge for implementation in practice will be in providing guidance and training appropriate to different sectors, which have their own different traditions, expertise and experience (or not) of strategic forms of assessment".

Brooke *et al.* (2004) develop on how SEA effectiveness can be maximized in South West England, where some experience has already been gained in the context of both environmental impact assessment (EIA) at project level and sustainability appraisal of regional and local land-use plans. Brooke *et al.* (2004, 142) points out that it is need to think in different terms than the project EIA, in order to consider the strategic aspects typically related to plans and programmes, adding that "[i]t is likely that different methods will be useful for different types of plan and this will need consideration in any guidance issued on methods for SEA".

Other authors have analyzed SEA guidelines in different sectors, in the European and international context. Donnelly *et al.* (1998) provide a summary on Impact Assessment Guidelines, by including a range of evaluation procedures: EIA, cumulative effects assessment, environmental health impact assessment, risk assessment, social impact assessment, and SEA. Donnelly *et al.* (1998) overall cite "[...] over 800 bibliographic references and abstracts for more than 90 countries and 45 international development agencies". Thériver *et al.* (2004) discuss guidance documents drawn up in some countries (as England, Iceland, Scotland, and so on) and highlights specific unresolved issues regarding: i) the application to other types of plans and programmes; ii) consultation; iii) and resourcing SEA, given that SEA practice requires considerable financial and human resources and a lack of them can affect the practical application of the recommendations proposed by the guidelines. Fischer (2007, 109) identifies and reviews over 40 guidelines. Finally, Schijf (2011) lists a number of considerations, suggestions and tips, mainly based on practical experience and opinions of SEA professionals involved in drafting of SEA guidelines, to design and draft guidance documents of good quality.

3 CLASSIFYING GUIDELINES: A METHODOLOGY

Our literature review has found few studies about drawing up effective SEA guidelines. We have selected the classification criteria as reported in Table 1.

CLASSIFICATION CRITERIA		REFERENCES
A	Specific guidelines	Brooke et al. (2004); Sheate et al. (2004); Thérivel (2004); Schijf (2011)
B ₁	Regularly updated	
B ₂	Case studies included	Schijf (2011)
B ₃	Availability on-line	

Tab. 1 SEA guidelines: classification criteria and references

The first criterion (A) is relevant in guidelines which refer to SEA implementation in given sectors or contexts. Some authors argue this criterion regards SEA guidelines that are too generic and do not take into account the hierarchical (policy, plan, or program) level (Schijf 2011) or sector of SEA implementation (Brooke *et al.* 2004; Sheate *et al.* 2004; Thérivel 2004; Schijf 2011). The second criterion (B₁) concerns periodic updating of SEA guidelines to adapt to changes over time of the local context and “follow the evolution of planning and SEA experience within a given system” (Schijf 2011). The third criterion (B₂) takes into account if real case studies have been included in SEA guidelines, as they “make SEA process more tangible [...]” (Schijf 2011), and provide lessons for practice. Another useful criterion (B₃) attains the availability of SEA guidelines on the World-Wide-Web such as in the case of, for example, the Hong Kong SEA Manual (Hong Kong 2007; Schijf 2011). Finally, Schijf (2011) considers the length (number of pages) of SEA guidelines, because those guidelines particularly long may be unattractive and tiring to read (see Tab. 3). However, this element may be assessed as too subjective, in our view, given that too brief SEA guidelines may provide poor guidance or it could be inefficiently structured; therefore, we decided to consider it separately with respect to the other key elements.

4 APPLICATION TO A SELECTION OF SEA GUIDELINES

In this section we apply the classification presented in section 3 to the analysis of a sample of SEA guidelines. The arguments unfold in two subsections as follows. We first define and illustrate the sample and indicate some preliminary features of SEA guidelines selected, with respect to implementation level, length of the document, and application of copyright policies. In the second subsection, we report on the classification of the sample.

4.1 DEFINING THE SAMPLE

We selected a number of SEA guidelines in the period between September to December 2013. We have investigated and retrieved SEA guidance documents at the international level, by using Google search engine and keywords in different languages: “linee guida valutazione ambientale strategica [+ Country’s name]”, “strategic environmental assessment guideline [+ Country’s name]”, “strategic environmental assessment guidance [+ Country’s name]”, “guía de evaluación ambiental estratégica [+ Country’s name]”, or other similar combinations.

After a first screening, we have identified 22 guidelines that concerns general SEA issues. We used a selection filter which included documents obeying four criteria: i) issued by a EU member state; ii) accessible on-line for free; iii) written up in English or Italian; iv) approved after the publication of (and coherent to) the SEA Directive. The seven documents meeting these filters have been released by the following countries: Ireland (2004), Italy (Formez 2006), Latvia (2007), Portugal (2012), Scotland (2013), Sweden (2010), and the UK (2005). Some countries, such as Italy and Portugal, have inserted SEA Directive principles in the

national juridical system well after the expected deadline (June 2004). Fig. 1 shows the localization of the countries, whose SEA guidelines were included in the first screening (in light grey) and finally selected (in dark grey). The guidance documents selected are described in Tab. 2.



Fig. 1 Localization of the countries issuing SEA guidelines included in the first screening (part A) and finally selected (part B)

In most cases, SEA guidelines attain different hierarchical levels, but mostly regard the preparation of plans and programmes. Portugal’s SEA guidelines take into account the policy level. Sweden and the UK have longer (with more pages) guidelines with respect to the other states. Three guidelines (Italy, Latvia, and Portugal) do not report information about copyrights (see Tab. 3).

In the next section, we present the first results of a comparative analysis of the documents selected.

EU STATE	DESCRIPTION	PUBLICATION YEAR	NATIONAL SEA REGULATION	ADOPTION YEAR
Ireland	Implementation of SEA Directive (2001/42/EC): Assessment of the Effects of Certain Plans and Programmes on the Environment Guidelines for Regional Authorities and Planning Authorities	2004	Regulations 2004 (Statutory Instrument Number 435 of 2004), and Planning and Development (Strategic Environmental Assessment) Regulations 2004 (Statutory Instrument Number 436 of 2004)	2004
Italy	La Valutazione Ambientale Strategica dei Piani urbanistici e territoriali [Strategic Environmental Assessment of Urban and Regional Plans]	2006	Environmental Code	2006
Latvia	Guidance to SEA in practice	2007	Environmental Impact Assessment (EIA) Act on 26 February 2004 and 15 September 2005 and by new secondary legislation	2004
Portugal	Strategic Environmental Assessment Better Practice Guide – methodological guidance for strategic thinking in SEA	2012	Decree-Law 232/2007	2007
Scotland	Strategic Environmental Assessment Guidance	2013	Environmental Assessment (Scotland) Act	2005
Sweden	Practical guidelines on strategic environmental assessment of plans and programmes	2010	Environmental Code	2004
UK	A Practical Guide to the Strategic Environmental Assessment Directive	2005	Environmental Assessment of Plans and Programmes Regulations	2004

Tab. 2 SEA guidelines in the juridical context (after Fischer 2007)

EU STATE	LEVEL	LENGTH (N. PAGES)	COPYRIGHT
Ireland	Plans	97	yes
Italy	Plans	36	no
Latvia	Plans and programmes	68	no
Portugal	Policies, plans and programmes	76	no
Scotland	Plans	51	yes
Sweden	Plans and programmes	142	yes
UK	Plans and programmes	110	yes

Tab. 3 SEA guidelines: level, length and copyright

4.2 RESULTS

The review of SEA guidelines with respect to the general criteria presented in Tab. 1 is now presented in Tab. 4.

Only the Italian SEA guidelines have been designed for a specific sector, i.e. land-use and town planning. In addition, SEA guidelines published by the UK refer to further guidance documents (partly not available on-line) relating, for example, to transport land use and spatial plans (UK, 2005).

EU STATE	A – SPECIFIC GUIDELINES	B ₁ – REGULARLY UPDATED	B ₂ – CASE STUDIES INCLUDED	B ₃ – AVAILABILITY ON-LINE
Ireland	x	x	x	v
Italy	v	x	v	v
Latvia	x	x	v	v
Portugal	x	x	v	v
Scotland	x	x	x	v
Sweden	x	x	x	v
UK	x	x	v	v

Tab. 4 Classification of SEA guidelines. Key: v for applicable, x for not applicable

The other SEA guidelines are generic, as they have not been prepared for a specific sector. SEA guidelines are not updated regularly in all cases and the oldest ones date back to ten years ago. Only four SEA guidelines refer explicitly to real case studies, even though their description is not complete; Irish SEA guidelines report references to SEA-type assessment cases. Finally, all guidelines are available on-line in PDF format. Since some guidelines have not been updated for several years, some hyperlinks lead to off-line Web resources.

5 DISCUSSIONS

In this section, we discuss the results obtained in the previous section. Italy has recently incorporated the principles of the European Directive in its legislative system. This has caused some delay in SEA implementation within spatial planning systems, both at provincial and municipal level (De Montis 2013; De Montis *et al.* 2013). Public bodies at the provincial and municipal level have prepared SEAs without certain regulations. Sometimes Italian Regions, such as Emilia-Romagna and Lombardy, have adopted specific local regulations inspired to the Directive (De Montis 2013).

Both the UK and Swedish guidelines are quite long (bearing more than 100 pages). However, we do not measure the quality of guidelines by length as long documents may get little consideration. Attention should be paid to this aspect of SEA guidelines; in addition, a good idea to drawn up SEA guidelines is to consider pre-existing material, paying attention to possible copyright issues (Schijf 2011, 491, 494). In our case study, three guidelines do not explicitly refer to copyright.

In general, SEA guidelines are intended to cover various hierarchical levels (from plans to programs) or sectors (land-use, mobility, and so on). Italian guidelines are specific for spatial planning at the municipal level, but they have the limitation that they are not related to the regulations issued in 2006, 2008, and 2010 about the integration of the SEA Directive in the Italian juridical system.

In general we have observed that Guidelines are not regularly updated. Portugal and Scotland have released SEA guidelines rather recently. Late updating may result in: i) the failure to introduce the contents of new regulations, as in the case of the Italian guidelines, and ii) the plight of links to other resources on-line which now are no longer available. In both the cases, the usefulness and reliability of the guidelines is negatively affected.

SEA guidelines include some case studies in quite a useful way, as they help designers in identifying the most effective solutions. Sometimes real case studies are replaced with theoretical examples that help to select the most adapt actions with respect to a particular stage of the SEA process (see, for example, guidelines of Sweden).

Finally, the publication on the Web of the SEA guidelines is a useful option, since it allows an easy and efficient use of those documents and presents other strengths: direct links to external resources, rapid consultation, easy updating, and SEA guidelines available in PDF format are easily printable, becoming available at any time and place and for any individual.

6 CONCLUSIONS

In this paper we analyze the SEA guidelines designed by some EU member states. We have selected seven SEA guidelines following four criteria: i) issued by a EU State; ii) the last freely accessible on-line; iii) written in English or Italian; and iv) drafted after the publication of the SEA Directive and explicitly referring to it. The guidelines selected have been analyzed with respect to some classification criteria identified in the SEA literature. No SEA guidelines satisfy all these criteria. In general, we have not found a clear prevalence of a guideline over the others.

This analysis is the starting point of further studies on SEA guidelines aiming at: i) enlarging the sample set of guidelines; ii) reporting on specific spatial planning and land-use SEA guidelines; and iii) calibrating evaluation criteria connected to finer SEA implementation issues.

REFERENCES

- Abaza, H., Bisset, R., Sadler, B. (2004), *Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach*, United Nations Environment Programme (UNEP).
- Balfors, B., Schmidtbauer, J. (2002), "Swedish Guidelines for Strategic Environmental Assessment for EU Structural Funds", *European Environment*, 12(1), 35-48.
- Brooke, C., James, E., Jones, R., Théritel, R. (2004), "Implementing the strategic environmental assessment (SEA) Directive in the South West of England", *European Environment*, 14(3), 138-152.
- Brown, A.L., Théritel, R. (2000), "Principles to guide the development of strategic environmental assessment methodology", *Impact Assessment and Project Appraisal*, 18(3), 183-189.
- De Montis, A. (2013). "Implementing Strategic Environmental Assessment of spatial planning tools: A study on the Italian provinces", *Environmental Impact Assessment Review*, 41, 53-63.
- De Montis, A., Ledda, A., Ganciu, A., Barra, M., Caschili, S. (2013), "Determinants of SEA effectiveness: an empirical investigation over municipal spatial planning in Sardinia", *Journal of Agricultural Engineering*, 44(s1), 460-466.
- Diamantini, C., Geneletti, D. (2004), "Reviewing the application of SEA to sectoral plans in Italy. The case of the mobility plan of an alpine region", *European Environment*, 14(2), 123-133.
- Donnelly, A., Dalal-Clayton, B., Hughes, R. (1998), *A Directory of Impact Assessment Guidelines (Second Edition)*. London: International Institute for Environment and Development.
- Fischer, T.B. (2006), "Strategic environmental assessment and transport planning: towards a generic framework for evaluating practice and developing guidance", *Impact Assessment and Project Appraisal*, 24(3), 183-197.
- Fischer, T.B. (2007), *Theory and practice of strategic environmental assessment: towards a more systematic approach*, London, Earthscan.
- Enplan Project (2004), *Linee guida VAS [in English: SEA guidelines]*, guidelines drawn up by Regione Lombardia (Italy), Regione Liguria (Italy), Regione Piemonte (Italy), Regione Autonoma della Valle d'Aosta (Italy), Regione Emilia-Romagna (Italy), Regione Toscana (Italy), Generalitat de Catalunya (Spain), Región de Murcia (Spain), Junta de Andalucía (Spain), Govern de les Illes Balears (Spain). <http://www.nemoambiente.com/node/121>.
- Formez (2006), *La Valutazione Ambientale Strategica dei Piani urbanistici e territoriali [Manual for SEA in land-use and town planning]*, FORMEZ, associazione riconosciuta, sottoposta al controllo, alla vigilanza e ai poteri ispettivi della Presidenza del Consiglio dei Ministri – Dipartimento della Funzione Pubblica – Programma Empowerment, Centro di competenza Strumenti e Politiche per la Sostenibilità Ambientale.

[http://db.formez.it/fontinor.nsf/661251a8a564c786c1256a930025a3c3/3BC691C1BD6C6303C12571A00034A8CE/\\$file/La%20Valutazione%20Ambientale%20Strategica%20di%20piani%20urbanistici%20comunal%20%28PUC%29.pdf](http://db.formez.it/fontinor.nsf/661251a8a564c786c1256a930025a3c3/3BC691C1BD6C6303C12571A00034A8CE/$file/La%20Valutazione%20Ambientale%20Strategica%20di%20piani%20urbanistici%20comunal%20%28PUC%29.pdf).

Hong Kong (2007), Hong Kong Strategic Environmental Assessment Manual, Environmental Protection Department, last updated: February 28th, 2013. http://www.epd.gov.hk/epd/SEA/eng/sea_manual.html.

Ireland (2004), Implementation of SEA Directive (2001/42/EC): Assessment of the Effects of Certain Plans and Programmes on the Environment Guidelines for Regional Authorities and Planning Authorities, Department of the Environment, Community and Local Government. <http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownload,1616,en.pdf>.

Italy (1999), Linee guida per la valutazione ambientale strategica (Vas) – Fondi strutturali 2000-2006 [in English: Guidelines for Strategic Environmental Assessment (SEA) – Structural Funds 2000-2006], Direzione generale VIA - Servizio per la valutazione di impatto ambientale, l'informazione ai cittadini e della relazione sullo stato dell'ambiente del Ministero dell'Ambiente, dal Ministero dei Beni e delle attività culturali e dall'Agenzia nazionale per la protezione dell'ambiente (Anpa). http://www.nemoambiente.com/files/Linee_guida_VAS%20fondi%20strutturali%202000%2006.pdf.

Italy (2006), Environmental Code. Legislative Decree 152/2006, In: Official Journal No. 88, 14/4/2006.

Italy (2008), Additional corrective and supplementary provisions to Environmental Code. Legislative Decree 4/2008. In: Official Journal No. 24, 29/1/2008.

Italy (2010), Amendments and additions to Environmental Code. Legislative Decree 128/2010. In: Official Journal No. 186, 11/8/2010.

Latvia (2007), Guidance to SEA in practice, Finnish Environment Institute and SIA Estonian, Latvian & Lithuanian Environment, Stockholm Environment Institute. <http://www.seit.ee/failid/629.pdf>.

Portugal (2012), Strategic Environmental Assessment Better Practice Guide – methodological guidance for strategic thinking in SEA, prepared by Maria do Rosário Partidário, Professor at IST-UTL for the Portuguese Environment Agency and Redes Energéticas Nacionais (REN), SA, Lisbon. <http://www.iaia.org/publicdocuments/special-publications/SEA%20Guidance%20Portugal.pdf>.

Schijf, B. (2011), "Developing SEA Guidance". In: Sadler B., Dusik J., Fischer T. B., Partidário M. R., Verheem R., Aschemann R. (eds.), Handbook of Strategic Environmental Assessment. London: Earthscan. 487-500.

Scotland (2013), Strategic Environmental Assessment Guidance, Scottish Government. <http://www.scotland.gov.uk/Publications/2013/08/3355>.

Sheate, W.R., Byron, H.J., Smith, S.P. (2004), "Implementing the SEA Directive: sectoral challenges and opportunities for the UK and EU", *European Environment*, 14(2), 73-93.

Sweden (2010), Practical guidelines on strategic environmental assessment of plans and programmes, Swedish Environmental Protection Agency. <http://www.naturvardsverket.se/Documents/publikationer/978-91-620-6383-2.pdf>.

Thérivel, R. (2004), *Strategic Environmental Assessment in Action*, London: Earthscan.

Thérivel, R., Caratti, P., Partidário, M.R., Theodórsdóttir Á.H., Tyldesley D. (2004), "Writing strategic environmental assessment guidance", *Impact Assessment and Project Appraisal*, 22(4), 259-270.

UK (2005), A Practical Guide to the Strategic Environmental Assessment Directive, Department for Communities and Local Government. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf.

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IMAGES SOURCES

Fig. 1: Picture created by Antonio Ledda; source of dataset: the World Borders Dataset provided by Bjorn Sandvik (thematicmapping.org). The dataset is available under the Creative Commons Attribution-Share Alike License (CC BY-SA 3.0).

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