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## Ecosystem services inclusive strategic environmental assessment

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### ABSTRACT

A consistent framework to address biodiversity, ecosystem services and their societal values is now established with the MEA (Millennium Ecosystem Assessment) and the TEEB (The Economics of Ecosystems and Biodiversity). These and other studies point to the urgency in considering actions that can revert the process of degradation of biodiversity values and its supporting ecosystems. Safeguarding livelihoods is a common objective in ecosystem approaches as well as in strategic environmental assessment (SEA) effort to promote sustainability. Human activities, as direct and indirect development drivers, are crucial targets for SEA to have a strategic contribution in influencing priorities, by showing strategic reasons for change. Rather than keeping only a control and mitigation role on the assessment of effects and impacts of development on the environment, SEA has the capacity to understand the decisional and development context and to drive development opportunities into pathways that are inclusive of environmental and sustainability priorities. The development opportunities provided by ecosystem services can be explored in SEA through strategic approaches to enhance the value of the benefits and avoid the negative impact of human actions on ecosystem services. SENSU, a research team at IST-Portugal, advocates the strategic-based and collaborative oriented approach in SEA based on Partidario (2007) SEA framework of critical decision factors (CDF). A methodology to allow the consideration of ecosystem services in SEA is being developed and tested. This paper will share research advances on how ecosystem services can be incorporated into SEA as a fundamental component of strategic assessment in support of decision-making.

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### 1. Introduction

The Millennium Ecosystem Assessment (MEA, 2005), and subsequently The Economics of Ecosystem and Biodiversity (TEEB, 2010a) are global studies carried out to assess, respectively, the consequences of ecosystem change on human well-being and the economics of biodiversity loss. Both studies highlighted the relationship between biodiversity and ES and their importance for human well-being.

Changes in ES are mostly driven by socioeconomic factors. Human demands on the provision of services increase with population growth, socioeconomic dynamics and land use changes, accounting for the most important drivers of change. The MEA revealed that 60% of the assessed ES were being degraded or used unsustainably, causing disproportionate impacts, contributing to social disparities, increased poverty and social conflicts around the world. Many other studies (Pereira et al., 2009; Slootweg et al., 2010; TEEB, The Economics of Ecosystems and Biodiversity, 2010a, 2010b; UNEP, 2011; WBCSD, 2011) point to the urgency of considering actions that can revert the process of degradation of biodiversity values, and its supporting ecosystems.

MEA (2005) suggested, and many authors and studies have confirmed (Geneletti, 2011; Haines-Young et al., 2012; Partidario and Slootweg, 2012; Pereira et al., 2009; Slootweg et al., 2010; TEEB, The

Economics of Ecosystems and Biodiversity, 2010a, 2010b) that human well-being and the safeguard of ecosystems may be considered strongly linked. The recognition of this link is a strong argument to enforce the incorporation of ES in territorial development strategies. Extending the application of the ES concept at the level of land use public policies will allow the effects of certain land use development options on ecosystems, and on their ability to provide services, to be considered and evaluated while making land use proposals, and choices on future developments. This will mean a significant shift in the way land use planning is currently done, enhancing a major contribution to the strategic safeguard of ES maintenance, and consequently the well-being of the communities that depend on them. Strategic environmental assessment (SEA), as a strategic decision support instrument, can play a significant role in ensuring ES consideration through the environmental and sustainability assessment of spatial and land use plans. This means therefore that SEA and ES can be relevant to each other because both make sense at strategic levels, and share human well-being and safeguarding livelihoods as leading undertakings to promote sustainability.

Private (Coca-Cola, 2012; Walsh, 2011) and government efforts (Garbach et al., 2012) in considering biodiversity through ES confirm theoretical findings. But despite growing recognition, mainstreaming ES into decision-making and stopping ES unsustainable use are still an intended objective. The research question in this paper is about the extent SEA may be able to help achieve that objective by exploring and assessing territorial development options that may enhance

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the safeguard of ecosystems, and consequently their capacity to provide services. This opens an important opportunity for SEA in strategic decision-making, considering the role that SEA increasingly plays in territorial planning at different geographical scales.

The aim of this paper is to explore the role that SEA can play in placing ES in the decision-making agenda, and to discuss the relevance and possible approaches to integrate ES in SEA, by positioning biodiversity, and the services provided by ecosystem services, as a key factor in decision-making. For that purpose this paper advances a methodology for considering ES in SEA in an integrated way, after presenting arguments on why strategic approaches in SEA offer a greater potential than conventional environmental impact assessment (EIA) based SEA. The relationship between SEA and ES is explored before a methodological proposal for ES inclusive SEA is presented. This methodology is being tested in several contexts in Portugal. Results of a preliminary application of this methodology to the Alcochete Municipality will be presented to illustrate some of the steps and possible outcomes.

## 2. Strategic approaches to SEA and opportunities for integrated decision-making

SEA is frequently described as an environmental assessment approach which purpose is to address the environmental effects associated with policies, plans and programs. This concept relates to a primitive form of SEA based on its EIA origins and on an underlining *one-size fit all* rationale to control the effects of policy, planning or programmatic decision on the environment. Frequently named EIA-based SEA this approach, adopted by sectoral and environmental authorities in many world countries, reveals its strength in reducing uncertainty in relation to what needs to be documented to meet legal requirements. But its inefficiency in dealing with complexity and in providing effective strategic direction has for long been strongly argued in the literature (Kørnøv and Thissen, 2000; Nilsson and Dalkmann, 2001; Partidario, 1999, 2000).

A SEA that is more integrative, participative and interactive, proactively facilitating improvements in policy-making, planning and decision-making in constructive ways has been promoted by several authors as more appropriate to complex decision contexts (Bina, 2003; Eggenberger and Partidario, 1991; Kørnøv and Thissen, 2000; Nilsson and Dalkmann, 2001; Nitz and Brown, 2001; Nooteboom, 2006). In this new perspective SEA's main role is to upstream environmental and social issues into higher levels of decision-making to improve the policy and planning decision contexts, within which projects will eventually be conceived and developed. Rather than assessing the direct or indirect impacts of policies, plans and programs on the environment, through its projects, the rationale underlining this new approach is to take advantage of the SEA advocacy role for better environmental and sustainable decision-making, influencing policy and planning culture and contexts (Partidario, 2009, 2012).

What has been argued for many years (Partidario, 1996, 2000, 2007a, 2007b) is that in order to be effective and responsive to decision needs, SEA must offer flexibility and cannot be formatted as a standard, streamlined sequence, of conventional activities, and in EIA-based SEA. A strategic based model for SEA was proposed by Partidario (2007a, 2007b) to enable a mutual molding process of SEA and strategy formation, working through problem perception and policy design to flexibly respond to problems. This new concept of SEA is based on a framework of elements and activities to enable its flexibility and adaptive design as needed, multiplying SEA opportunities to fit different decision processes. SEA's key role is to facilitate decision-making by involving key actors, enabling dialogues towards mutual understanding, and ensuring long-term and large scale perspectives when considering development options (Partidario, 2009). Methodologically this SEA model is based upon a strong focus on key integrated factors – the critical decision factors (CDF) – and respective assessment criteria that structure the

assessment to hit the core of the decision strategic issues, processes and contexts.

The CDF methodological framework (Partidario, 2012), which supports the ES inclusive SEA methodology (Section 4), follows this strategic based model, and is structured in three fundamental stages in a cyclical process (Fig. 1): 1) SEA context and strategic focus; 2) pathways for sustainability and guidelines; and 3) a continuous stage of follow-up, process linkage and engagement.

The point made is that, when conceived with a strategic insight, SEA offers a greater potential to integrate the fundamental factors that need to be considered in policy, planning and programmatic decisions to ensure a development that must be sustainable. That potential is enhanced by the strategic role of SEA in influencing decision-making through the integration of relevant “big picture” environmental issues at the core of strategic decisions to help identify pathways for sustainability. ES represent critical biodiversity aspects that must be factored into decision-making, particularly within spatial and land-use policies and planning. At strategic levels SEA must take ES as “big picture” sustainability issues, related to human well-being and sustainable livelihoods. SEA needs to act strategically in relation to why doing, who to engage, what to consider and when and how to influence decision-making to increase its chances of success. As such, SEA and ES will be mutually relevant.

## 3. SEA and ecosystem services

The Convention on Biological Diversity (CBD) requires that appropriate arrangements are established to ensure that environmental consequences of policies, plans and programs that are likely to have significant adverse impacts on biological diversity are taken into account, and whenever possible to allow public participation on those processes (article 14). On the other hand ES are seen as an important tool for communicating and mainstreaming biodiversity in various sectors and policies (TEEB, *The Economics of Ecosystems and Biodiversity*, 2010a, 2010b), and a crucial element in the reporting towards new biodiversity targets (Toivonen, 2010).

The integration of biodiversity in EIA and SEA has been evolving from conservation to an integrated approach. For Slootweg et al. (2006) biodiversity should be seen as a provider of goods and services set through ES in EIA and SEA contexts. Emphasis has been placed particularly on the role of SEA in creating opportunities for local and regional planning (TEEB, 2010b). Considering the socio-political nature and the broad geographical scale in the assessment of policies and plans, the assessment of ES can be a smart way to consider the strategic importance of biodiversity for given regions and communities.

SEA and ES are both concepts aiming to protect the environment and the promotion of human well-being. The success of this objective is enhanced through integrative approaches that interwoven social, economic and environmental factors as highly inter-related dimensions (Gibson et al., 2005), particularly when conducted in a strategic sense (Partidario, 2009).

Recent methodological guidelines to assess and integrate ES in decision-making have been published by the WRI (2008), the OCDE (2008), and Slootweg et al. (2010), however the practice, and evidence, of integration of ES in SEA are still in its infancy (Geneletti, 2013). Van Beukering et al. (2008) found, through the integration of ES in the SEA process, that SEA has harnessed the potential and the opportunity to generate the expected benefits. Despite difficulties in finding practical evidences for the application of ES on an SEA context, the authors present ten cases studies where the identification, quantification and valuation of ES effectively contributed to the decision-making, recognizing that a methodological reference is still lacking. Geneletti (2011 and 2013) provides valuable insights and further examples on how to promote the ES inclusive SEA, suggesting actions for increasing information on ES in SEA, but still using a rather standard SEA flow of activities and linkage to planning.

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