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Strategic Environmental Assessment mainstreaming Ecosystem Services. The role of Stakeholders.

Sustainable development through high levels of involvement and participation

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Abstract

Modern phenomena as the rapid urbanisation growth, global economic crisis and an extended environmental crisis, are being tackled with actions that are reflected at different levels, such as the international, national and regional. Diverse initiatives are proposed in the direction of reaching a more sustainable development, and attempt to fill the gap between nature and our urbanisation needs. Acknowledging that natural ecosystems are providing ecosystem services to citizens, and contribute to health, development, and the improvement of the quality of life of dwellers in all dimensions.

In this context, the ecosystem approach calls for involvement of stakeholders and active participation of local communities for carrying out environmental assessments. Several reasons support this recommendation, among them: knowledge acquisition, shared decisions, transparency, long term effects prediction, broad and more innovative proposals for alternatives, etc.

This research has as a main objective to find the challenges, benefits and opportunities of increased engagement of Stakeholders, since early stages of environmental assessments, and when ecosystem services are integrated in the procedure of evaluation. Qualitative methods are used, such as: three cases of SEA from different countries, interviews to expert academics and practitioners, and general trends drawn with data from a survey among experienced environmental professionals; interesting findings are combined and analysed.

Collaborative planning gives framework for the understanding of how stakeholder's participation serves as a mean to make the integration of ecosystem services into SEA. Features of the collaborative planning model, such as: knowledge integration, meaningful involvement, functioning governance and sustainable use of the area, are reflected in SEA.

At least three methodologies for integration of ecosystem services into SEA are highlighted, for which engagement of stakeholders is essential; besides the role of the actors in aspects of ecosystem services is well defined. However, it is evidenced that challenges associated to these practices need to be overcome. Methodologies require to be adapted to the socio-political, socio-economic and environmental context of each country or region where they are intended to be implemented. Time and economic resources are still the two major downsides of increased involvement of stakeholders, but they are presumed to be compensated by the quality in the outcomes of the SEA.

Resumen

Fenómenos modernos como el rápido crecimiento de urbanización, la crisis económica mundial y una crisis ambiental extendida, se están abordando con las acciones que se reflejan en los diferentes niveles, tales como el internacional, nacional y regional. Se proponen diversas iniciativas en la dirección de alcanzar un desarrollo más sostenible, y tratar de llenar el vacío entre la naturaleza y nuestras necesidades de urbanización. Reconociendo que los ecosistemas naturales están proporcionando servicios de los ecosistémicos a los ciudadanos y contribuyen a la salud, el desarrollo y la mejora de la calidad de vida de los habitantes en todas las dimensiones.

En este contexto, el enfoque ecosistémico exige la participación de los interesados y un rol activo por parte de las comunidades locales para llevar a cabo evaluaciones ambientales. Varias razones apoyan esta recomendación, entre ellas: la adquisición de conocimientos, decisiones compartidas, transparencia, predicción de los efectos a largo plazo, propuestas más innovadoras para las alternativas, etc.

Esta investigación tiene como objetivo principal encontrar los retos, beneficios y oportunidades de una mayor participación de las partes interesadas, desde las primeras etapas de la evaluación ambientales, y cuando los servicios ecosistémicos se integran en el procedimiento de evaluación. Con métodos cualitativos tales como: tres casos diferentes de EAE realizados en diferentes países, entrevistas a expertos académicos y profesionales, y las tendencias elaborados con datos de una encuesta entre profesionales del medio ambiente; los hallazgos son interesantes, se organizan y analizan en conjunto.

La planificación colaborativa da marco para la comprensión de cómo la participación de las partes interesadas sirve como medio para hacer que la integración de los servicios de los ecosistemas en la EAE. Características del modelo de planificación en colaboración, tales como: la integración del conocimiento, participación significativa, gobernanza y uso sostenible de la zona, se reflejan en la EAE.

Se destacan al menos tres metodologías para la integración de los servicios ecosistémicos en la EAE, para las cuales es esencial la participación de los interesados, y su papel en aspectos de servicios ecosistémicos está bien definida. Sin embargo, se evidencia que los problemas asociados a estas prácticas aún deben ser superados. Las metodologías requieren ser adaptadas al contexto socio- político, socio- económico y ambiental de cada país o región en la que están destinadas a ser implementadas. Además, el tiempo y los recursos económicos siguen siendo los dos principales inconvenientes de una mayor participación de los interesados, que se supone son compensados por la calidad de los resultados de la EAE.

Preface

This thesis is submitted in fulfilment of the requirements for the programme Master degree JEMES CiSu – Joint European Master Degree Environmental Studies, Cities and Sustainability. The research was carried out in the last semester of the two years programme, it is an individual work based on literature review, data collection and theories.

This research gave me an opportunity to apply the knowledge previously acquired in the master studies, and it mostly served as a mean to gain expertise on the topics of major interest for me. Besides, it provided a chance to establish contact and get support and collaboration from NIRAS A/S, a well-known Danish engineering consultancy company, which is now an international enterprise. NIRAS Consulting Ltd, which is the branch based in UK, provided valuable inputs, guidance and support, especially for the data collection process.

This report contains seven chapters, and five appendixes for complementary information with either data gathered in this research or additional material from literature.

Regarding my own learning process, I want to highlight that the review of the three SEA cases and all the literature review needed for this research, has been one of the best sources of knowledge in the coursework of the Master study. Besides, the possibility to gather information through experts has been a unique opportunity to get inspiration, and know from first-hand the expert's opinion about my topic of major interest.

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To my family; and every supportive person in Denmark, Germany and China.

1 Introduction

Sustainable development has turned into a global challenge which is nowadays well-known and acknowledged by most governments, civilians and worldwide organisations. The three pillars of sustainability are desired to be managed in equilibrium: the economic, the social and environmental dimensions; new trends highlight a fourth element that seems to be needed to underpin the three others, which is referred to as good governance *(Sachs, 2014).* Moreover*, a*ccording with its basic definition, sustainable development means the availability of resources and the satisfaction of human needs which cannot be assured only for current populations but also for future generations *(Jones, 2005, p. 2).* In this context, SEA emerged as one of the tools to incorporate sustainability principles into planning processes, and for more than two decades it has been studied for improvements to increase its attributes that support a real sustainable development. *(Bueren, Bohemen, Itard, & Visscher, 2012, p. 351) (Mario Gauthiera, Louis Simardb, & Jean-Philippe Waaubc, 2011) (Lydia Lamorgese & Davide Geneletti, 2013a)*

In the later years, an urge to stop the biological diversity degradation has raised actions in a global scale, and as a result, assessments of biodiversity and ecosystems have been objects of intense work carried out by scientists and professionals from all fields *(World Resources Institute, 2005c, p. 1)*. As a parallel action, integration of biodiversity and ecosystem services into environmental assessments, like Strategic environmental assessment – SEA and Environmental Impact assessments - EIA, have been proposed and encouraged by environmental organisations, as well as by experts in environmental protection and development *(Slootweg, Kolhoff, Verheem, & Hoft, 2006a) (European Commission, Directorate-General for the Environment, Collingwood Environmental Planning Ltd, Integra Consulting Ltd, & Milieu Ltd, 2013) (Geneletti, 2011a) (Partidario & Gomes, 2013)*.

The Millennium ecosystem assessment raised two alarming issues with respect to the ecosystem services and the growth of population, the first one points to the high rate of degradation of ecosystem services, and the second indicates how this phenomenon is implicating global consequences. Research has already shown that there is a need for a shift in mentality and in the trend of development, as well as for designing innovative strategies where the approach to sustainability is made from a social-ecological perspective (*Stockholm Resilience Centre*, *2008*).

Moreover, stakeholder's engagement and higher levels of participation are practices which have been considered as crucial steps to obtain successful results in environmental assessments, EIA and SEA. Stakeholder's involvement has been an object of studies, reviews, promotion and in some cases even "criticism" *(Van Buuren & Nooteboom, 2010) (Mario Gauthiera et al., 2011) (Juliette C. Young et al., 2013) (Gustavo Vicente & Maria R. Partidario, 2006) (A. Chaker, K. El-Fadl, L. Chamas, & B. Hatjian, 2006) (Partidario & Gomes, 2013) (Jouni Paavola & Klaus Hubacek, 2013).* Complementary, there is a special interest for involvement of stakeholders in the urban planning processes, aiming to make influence in the content of plans *(Maija Faehnlea & Liisa Tyrväinen, 2013, p. 332) (He et al., 2011);* in the latest reference, an interesting emphasis is proposed, where a combination of urban planning with collaborative

process, plus SEA and integration of ecological planning is desired for creating sustainable cities.

Regarding the integration of ecology and the urban environment, concepts like urban governance serve as a framework for enhancing collaboration *(Elmqvist, 2013a, p. 560)*. A practical application is developed through tools like SEA where collaborative governance is clearly facilitated *(Van Buuren & Nooteboom, 2010)*. Moreover, with an integration of ecosystem services and biodiversity in the assessment procedures, a rebound of intense participation of stakeholders is generated. This type of practices is now claiming to be a successful tools which leads to better decisions in the fields of environmental assessments, and resources management; this idea includes urban and spatial planning contexts *(Honrado et al., 2013) (Partidario & Gomes, 2013) (Geneletti, 2011a) (Erik Nelson et al., 2009).*

According to the literature, reasons to pay special attention to ecosystem services are the next: national regulations and international treaties or agreements; protection of quality of life with the acknowledgement that societies are dependant of ecosystem services; economic reasons, since economy can be enhanced through the reasonable use of local ecosystem services; the ecosystem services are linked to biodiversity features which need to be protected; future development of services which can be still unknown and be hidden behind genetic biodiversity *(Maria R. Partidario (IST), 2013, p. 8)*

The interaction between nature and urbanisation needs to be mediated. Natural ecosystems are providing ecosystem services to citizens, contributing to health and improving the quality of life of dwellers (*Adrienne Grêt-Regamey, Enrico Celio, Thomas M. Klein, & Ulrike Wissen Hayek, 2013, p. 108)*. The value of the ecosystems is placed in the fact that they maintain life on earth. Besides, the services, which are naturally generated, are sustaining not only the ecosystems itself but also providing services and goods to the societies, which are built and based on those ecosystems *(World Resources Institute, 2005b, p. 128).*

With above described ideas about sustainability and its implementation, and recognising the imperative need to strength actions to incorporate tools and strategies into the urban planning agendas. The current research is focused in the framework of urban, rural and spatial planning, and the practices that can be effective in the challenge of building more sustainable cities. An emphasis in stakeholder's involvement is presented for the strategic environmental assessment -SEA- when ecosystem services are explicitly integrated into the procedure, situation that also implies biodiversity conservation in some extent.

Cities are considered as centres of ecosystem services uses as well as sources of environmental impacts. That is the reason why cities have a key role in the environmental governance in the context of urban landscape. Many ecosystem services sources are located in the rural areas, and are affected as a consequence of the urbanisation happening in the cities *(Secretariat of the Convention on Biological Diversity CBO, 2012, p. 43)*.

The efficacy of good governance practices for protection of the environment, depends on the involvement of stakeholders, who actively participate in the evaluation of the multiple drivers of biodiversity loss. All the sectors and levels of decision-making need to be involved;

moreover, the cooperation need to be done in both directions: vertical (international, national, etc.) and horizontal (divisions such as environment, planning, transportation, education, etc.) *(Secretariat of the Convention on Biological Diversity CBO, 2012, p. 43)*

To synthesize this introduction. There are still very few number of studies and real cases where SEA which is mainstreaming the ecosystem services framework, literature is also scarce on this specific topic; the reasons for this are several and need to be explored. What real cases show, how practitioners express their opinions about it, and what experts say, comprises a set of relevant contributions to the field for improving both SEA and the trend to sustainable development. In this context, the stakeholder's early and high engagement has been pointed as the clue for reaching successful assessments, which is why the focus of this research is done on participation and collaboration.

Why is this research relevant?

Current research projects which emphasise on cities and the urbanisation trends, such as: "Cities and Biodiversity Outlook" and "URBES", have expressed concerns about the need for strengthening the implementation of scientific findings into the urban governance practices.
Actions are required for closing the gaps between science and policy, to reach a common objective as it is the sustainable development and resilience of cities. Experts have given several reasons to explain why planners are not using research findings, among them: the complexity of the interaction of the systems is acknowledged, and it is recognised as an obstacle which needs the use of new linking tools; the time length needed for those findings to cause real effects in policies; the scale and geographical limitations of the researches; lack of scientific literature in the fields of urban environmental governance; accessibility to knowledge at the level of decision-makers *(Elmqvist, 2013a, p. 553).*

The present research aims to contribute in the field of the practical tools needed to fill those gaps between science and policy. The research topic in SEA for mainstreaming ecosystem services through the stakeholders involvement, in both aspects, in search of the best methods and insights on challenges and opportunities; brings material for increasing the chances of progressing in the line of urban environmental governance.

1.1 Structure of the report

The present report is divided in seven chapters. The first one gives an introduction to the main problem, current situation, state of the art and concerns with Stakeholders and ecosystem services, to end with the research questions. Besides, concepts like governance, urban ecology, and SEA - Strategic environmental assessment – arise in this chapter.

The theoretical framework is described in Chapter No. 2, collaborative planning is described as a theory to frame the research. Tools and techniques related to stakeholders are presented.

The Chapter No. 3 explains the methodology, the research paradigm followed in the research project, and presents the research design. Methods for data collection are described in detail.

The main data collected from interviews, SEA reports and a survey is summarised in the Chapter No. 4. The discussion about the results is made to lead to the conclusions.

Chapter No. 5 draws conclusions and reflections about the research and findings. Chapter No. 6 includes the references, and the last Chapter is for additional or complementary information which is organised in five Appendixes.

Before the State of the art section, few definitions are included to clarify the main concepts included in the present report.

Definitions

Biodiversity: "*the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems*" *(Slootweg et al., 2006a, p. 18)*

Ecosystem: "*'Ecosystem' means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit*" *(Secretariat of the Convention on Biological Diversity, 2004, p. 6)*

Ecosystem services: "*the benefits people receive from ecosystems'. TEEB also sets out the basis of human dependence on the natural environment. The European-led study builds on the United Nations Millennium Ecosystem Assessment, which defined four categories of ecosystem services that contribute to human well-being*": provisioning, regulating, cultural and supportive. *(Kumar, 2010)*

Ecosystem approach: "*is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way" (Secretariat of the Convention on Biological Diversity, 2004, p. 34)*

Governance: *"'the process by which we collectively solve problems and meet our society's needs — government is the instrument that we use'. Governance encompasses not just government, but also the private sector and civil society (individuals and groups) and the systems, procedures and processes in place for planning, management and decision-making" (Julia Porter, 1999)*

Stakeholders: "*who is affected by the decisions and actions they take, and who has the power to influence their outcome" (Reed et al., 2009, p. 1933)*

Trade-offs: "*Ecosystem service trade-offs arise when the provision of one service is enhanced at the cost of reducing the provision of another service and ecosystem service synergies arise when multiple services are enhanced simultaneously*" *(Jouni Paavola & Klaus Hubacek, 2013, p. 1)*

1.2 State of the art

Collaboration

With the main purpose of finding the benefits, challenges and opportunities of an increased Stakeholder's involvement in environmental assessment procedures that integrate ecosystem services with specific emphasis; I look for the current state of the art related to the topic, and more specifically literature related to participation of actors for environmental assessment, ecosystem services integration into SEA or environmental assessments. Urban ecology concepts describing the existing biodiversity in cities as well as in any type urban environment. Besides, the main characteristics of good governance related to the nature resources management and conservation are also investigated.

To clarify how ecosystem services is approached in this research, as the central subject of the environmental assessments, it is needed to mention that it is not considered only as an assessment tool, but it is a concept that follows the principle of sustainability: linking nature resources and biodiversity reasonable use, with human well-being, while urbanisation is encouraged for economic and social development. Ecosystem services framework is emphasised in the present research as the key aspect to improve the process of environmental assessments, as well as to achieve better decisions when policies, plans or programmes for spatial planning or urban planning is the framework. Serving as a tool to reach sustainable development.

The Stakeholders importance for this research relies on the fact that ecosystem services are valued differently according to their perception, particular needs, scale of the evaluation and geographical, economic, and socio-cultural context where the stakeholders are based. This idea applies mostly for those non-marketed ecosystem services, but it is not exclusive of the marketed ecosystem services. Besides, from the ecological perspective, each ecosystem service has its own value, which needs to be commuted with the stakeholder's perceived value *(Jouni Paavola & Klaus Hubacek, 2013, p. 2))*

After having a clear understanding of which actors have interest or/and might be affected by an initiative, and the nature of the relationship among those actors, then the concept called involvement of stakeholders can be applied, for promoting participation in environmental decision-making *(Reed et al., 2009, p. 1935).*

Regarding the stakeholders involvement in nature resources management and its associated practices, like the environmental assessments, several tools and methods have been tested; these tools evidence the role of local communities, who are part of the stakeholders in the context of this research, acting as contributors of data related to ecosystem services, as well as defining trade-offs, and giving the insights needed to pursue biodiversity conservation *(Kelvin S.-H.Peh et al., 2013).* Moreover, stakeholders analysis and participation of key actors has been used as a way to legitimise the decisions *(Reed et al., 2009, p. 1935).*

According to studies, the engagement of collaborators combined with the creation of future scenarios, facilitates the decision-making process, which can be more effective and lead to the enhancement of provisioning of the ecosystem services *(Jouni Paavola & Klaus Hubacek, 2013, p. 2).* Thus, It has been stated that stakeholders involvement is a key factor to reach better decisions, as well as for the improvement of relationships among stakeholders; however, the same research which concluded the above mentioned, could not find a proof that stakeholders involvement could produce better environmental quality *(Juliette C. Young et al., 2013, p. 360).*

It is important to highlight the main motives why authors consider as being worthy the engagement of stakeholders. There are at least three reasons for having an increased stakeholders involvement in the context of nature conservation and environmental assessments, such as: strengthen democratic processes, additional knowledge in the decision-making which serves as foundation for better decisions, and the last one is related to the legitimacy which was already mentioned in this section *(Juliette C. Young et al., 2013, p. 359).*

Stakeholders play a relevant role in the integration of knowledge which has been acquired through different perspectives. With participation, it is possible to add reliability and wider understanding in the process of identification of ecosystems, for a specific territory and conditions of land change. If a large group of actors is selected to play an active role and participate in the process of ecosystems identification the results are even more significant. Stakeholders participate in the construction of scenarios, which has been suggested as a central tool for carrying out environmental assessments *(Malinga, Gordon, Lindborg, & Jewitt, 2013, p. 2)*

Ecosystem services

Ecosystem services as a concept allows us to reconnect nature and urban systems, since it is possible to use them to inform decision-makers about the interrelations among nature, human well-being and the development made through urbanisation *(Sijtsma, van der Heide, & van Hinsberg, 2013)*. Having the characteristic of providing quantification measures which can be interpreted by decision makers.

It has been already proved that there is a high dependency of urban populations on ecosystem services within and outside of its own urban perimeter; studies and projects carried out since two decades ago have been collecting information related to this particular issue, *(Wilkinson, Saarne, Peterson, & Colding, 2013, p. 1). A*wareness and concern about the rate of urbanisation with its environmental consequences increases while the ecological degradation continues. Biodiversity builds the basis of ecosystem services, and at the same time ecosystem services build the resilience of the urbanised environment, where the interaction of the three aspects: the built, the social and the bio-physic dimension, allows to the whole system to resist changes and get adapted to new environmental and urbanisation conditions *(Rockström, Johan, 2014, p. min. 1:30).*

Basically, the ecosystem services framework enlarges the set of impacts evaluated in the assessment which in turn also varies the alternatives related to the policy or plan in evaluation *(Sijtsma et al., 2013, p. 15).* According to the Millennium Ecosystem Assessment, the list of potential ecosystem services to include into evaluations goes up to the number of 30, which are recommended to be considered as part of the impact's evaluation of a certain types of polices, plans or projects. The most positive consequence of the approach of ecosystem services is that impacts on no-marketed services such as the regulating and supporting, can be detected and prevented, or mitigated since the early stage, *(Sijtsma et al., 2013),* situation that is usually neglected in an assessment that is not integrating the ecosystem services.

Tools that lead to a sustainable use of ecosystem services are described by the Millennium ecosystem assessment studies, and they rely in great extent in the ability of quantification of those services. The valuation has provided specific and measurable information to the decision-makers to facilitate a fair selection of alternatives.

There are two main perspectives to look at biodiversity, the first one associated with its conservation and maintenance of the well-functioning of the natural ecosystems. The second one, is related with the economic and social well-being that is derived from the use of biodiversity *(Maria R. Partidario (IST), 2013, p. 9).*

Valuation of Ecosystem services

For environmental assessments which are integrating ecosystem services, the need of valuation is imperative. Therefore tools to achieve the most accurate measures need to be applied. Among several methods, it can be highlighted the application of cost benefit analysis -CBA- and multi criteria analysis -MCA-, which have been acknowledged as supportive methods for decision-makers. Researches have proposed a fusion of the two mentioned methods, which takes the strengths of each one to build a more complete tool to give a solid platform for the decisions *(Sijtsma et al., 2013, p. 16).*

In terms of ecosystem services, valuation/quantification is linked to the type of services, which have been classified by the Millennium Ecosystem Assessment –MEA- in the four already known different types. *(Elmqvist, 2013b, pp. 189–200).*

There is a common trend to include in evaluations only the services which have a market value; however, the group of Non-marketed ecosystem services, such as cultural and habitat or supportive services, also need to be valuated to make a complete assessment. The participation of stakeholders, which includes local communities but not only this actor, gives the possibility to add the perceived value of those ecosystems *(Kelvin S.-H.Peh et al., 2013, p. e56)*.

Below a general classification of values is presented:

- Social value: expressed as quality of life. Health, safety, environmental justice values, etc.
- Economic value: as the profits obtained by trade of products. As materials for derived economic activities. As raw materials.

- Ecological value: the future value and the value of local functioning of the system, also known as biophysical value.
  (Maria R. Partidario (IST), 2013, p. 12) (Elmqvist, 2013b, pp. 189–200)

Even though the ecosystems services can lead to a wider understanding of how the natural resources management needs to be done in the current environmental crisis; it is also important to recognise how complex the social-ecological systems are, what leads to uncertainties related to the relationships among the ecological systems and how they respond to the multiple drivers of change inflicted by human and non-human activities *(Jouni Paavola & Klaus Hubacek, 2013, p. 1).*

Urban Ecology and governance

Concepts like urban biodiversity governance have emerged in the later years, as an answer to the needed shift for a more collective responsibility in terms of urbanisation growth and its equilibrium with nature. The new trend opens more opportunities for actors to take active participation in activities related to the planning cities and environmental protection initiatives.

The current global situation where there are high pressures on ecosystem goods and services, mixed with the global financial crisis, are events that lead to the decentralisation of governance and increment of stakeholders. *(Juliette C. Young et al., 2013, p. 359).* The concept of good governance implies dynamic management, where actors like citizens, government, and other stakeholders join efforts to work and to create a common benefit *(The Global development research center, GDRC, n.d.-b).*

Urban ecology helps on the understanding of concepts related to social systems in fusion with ecological systems, its relationships, interdependency and complex dynamics *(Niemelä et al., 2011).* The collaboration among ecologists and urban planners can give better understanding of how the urban areas behave as social-ecological systems, and how to design resilient cities *(Pickett & McGrath, 2013, p. 108).*

There are two different approaches for ecology and cities interrelation:

1. The approach which sees Ecology OF cities, where the city is a system where three components interact: Social, Bio-physic and Built environment. This is the approach of the interest of this research because it covers the ecosystem services and allows to planners to look for solutions that result in creation of sustainable cities.

2. The approach which sees Ecology IN cities, looks at the ecology that has been left of created in the city and co-exist with in the dynamic of the city. The emphasis is made in the ecology and not in the city and social aspects.
   (Pickett et al., 2013, p. 00)

The topic of urban ecosystems is relevant for this research, because it helps on the understanding of urban planning for sustainable cities. Cities find their suppliers of basic goods as: food, freshwater, temperature regulation, air purification, raw materials, etc., not only in the city itself, but also in the peri-urban or rural areas around it. The rural areas proving goods and services to cities could be closely located or far away from the final users. In terms of ecosystem services dependency, the urban and the rural areas are tightly connected. Therefore, an assessment of ecosystem services in cities find its complement in the evaluation of those ecosystem services located in the rural areas.

Through classification and description of the ecosystem services present or provided by urban systems, it is possible to gain knowledge about how they contribute with a better quality of life in cities *(Elmqvist, 2013b, p. 178)*. Urban ecosystems services usually have a direct effect on human health and security, and the raking of services in a scale of importance would vary according to the specific context as well as on the geographical location *(Elmqvist, 2013b, p. 178)*.

Another important point to review in terms of urban ecosystems and biodiversity in the city, is that the production of disservices can occur, and need to be evaluated for the well-being of the whole system *(Elmqvist, 2013b, p. 186).*

When transparency and democracy are priorities in the environmental management practices of nations, stakeholder's participation opens the possibility to enhance these two aspects, *(Reed et al., 2009, p. 1934)*, together with other positive features associated with good governance. Therefore, policies, strategies, plans and programmes are developed with the insights of interested/affected actors, which also results in more effective implementation of initiatives *(Reed et al., 2009, p. 1934).*

Even though good governance is still an ideal which can be hardly achieved in a complete manner, more countries are placing efforts in reaching a higher competence in features related to the good governance, such as: being accountable, transparent, responsive, equitable and inclusive, effective and efficient, follower of rule of law, participatory, consensus oriented *(The Global development research center, GDRC, n.d.-a).*

What has been recommended for local initiatives is the creation of multi-stakeholders coalitions, broad participation of all local stakeholders, creation of partnerships, and strengthening of networks; with the purpose to develop a good urban governance. It is also acknowledged that institutional and administrative reforms will be needed *(The Global development research center, GDRC, n.d.-a).*

As a final point, in the context of ecosystem services within the cities, it is relevant to mention green infrastructure. Green infrastructure comprises both natural and semi-natural areas, green spaces in the rural and urban zones, terrestrial and freshwater areas, and coasts or marine zones. The potential of delivering a wide ranges of benefits and services need to be taken into account in the development plans at the designing stage *(European Commission et al., 2013, p. 7)*

With insight in the above problem analysis and state of the art, the research question and derived sub-questions are formulated:

1.3 Research Question

What are the challenges, opportunities and benefits of increased engagement of Stakeholders, in environmental assessments which mainstream ecosystem services?

The next sub-questions are formulated according to the Case context, which is described in the next section.

Sub-questions:

What are the contributions from stakeholders to an SEA mainstreaming ecosystem services?

How and when the stakeholders need to be involved for this type of SEA?

How equilibrium can be reached in terms of resources such as: time and monetary expenses, with well-informed decisions and a democratic decision-making process.

What are the downsides of a higher involvement of stakeholders in an SEA mainstreaming ecosystem services?

What are the advantages evidenced in the practice of SEA of the increased involvement of Stakeholders?

What methods have been suggested for an SEA mainstreaming ecosystem services? Do they imply engagement of Stakeholders?

1.4 Case context

Urban aspects

The framework of the present research is in the urban and spatial planning. It is relevant to highlight that spatial planning affects directly aspects of ecosystem services, such as: distribution, quality and use. This is one reason why ecosystem services evaluation serves as a platform to support planning processes *(Geneletti, 2011b, p. 143)*

Urban development plans can serve as drivers for preservation of the existing biodiversity in cities *(Elmqvist, 2013a).* In the best case cities can even change their current degraded habitats, generating richer levels of species and associated ecosystems. Therefore, SEA carried out with focus in ecosystem services could make remarkable inputs for the conservation of biodiversity in a global manner.

Studies in the last decade have been proposing ecosystem services as a tool that leads to the improvement of environmental assessments, including the strategic environmental

assessment –SEA-. Considering the topic as a new framework which is called ESEA -ecosystem services environmental assessment-, which proposes the next three lines of action:

- "*Promoting and evaluating the use of ES typologies as integrative tools in environmental assessments*
- *Promoting and evaluating the explicit assessment of ecosystem services for the most relevant environmental factors*
- *Considering ecosystem services in the definition of priorities for impact mitigation and monitoring"*
  (Honrado et al., 2013, p. 21)

An integration of ecosystem services in urban forms, plus actions for preserving biodiversity in cities, gives to cities the ability to be more resilient, to climate change and to drivers of change in general terms *(Elmqvist, 2013a, p. 330)*. Besides, this integration results in greener infrastructure that also implies positive contributions to address climate change since the stage of planning of the urbanisation. Considering the large extension of land occupied by cities this action would make a remarkable difference to reach sustainability.

Strategic planning. SEA context

There are several approaches and tools to assist the integration of biodiversity into strategic environmental assessment -SEA, among them: the evolution baseline, natural capital, scenarios, risk management, etc. *(European Commission et al., 2013, p. 38)*. This research is focused in ecosystem services to achieve the integration of biodiversity in the strategic environmental assessment, and how is the implementation of the procedure of evaluation for development plans in the urban and rural context, as well as in the spatial planning context.

The reason to strengthen in the stakeholder's dimension of SEA is the high influence that stakeholders have in the final outcome, and the protagonist role that can be played in each of the different steps of the evaluation process. The active participation of stakeholders not only complies with the regulation established for SEA but also promises to lead towards better decisions as well as to enhance sustainability, especially when ecosystem services are central interest of assessment.

According to the reference *(Honrado et al., 2013, p. 21)*, if ecosystem services are not explicitly identified in the process of assessment (SEA), it can occur that they are overlooked, and as a consequence they could also be annulled, situation that could become in a new driver of change which affects other services. In the contrary, if the ecosystem services are explicitly addressed, then there are greater possibilities for identifying conflicts and synergies among the social dimension and the ecological dimension.

The ecosystem services approach in environmental assessments implies the protection of biodiversity in a non-direct way. The "*Guidelines for integration of biodiversity and climate change in EIA and SEA*" is a relevant document to be considered in this research, published by the European commission about one year ago. According to the guidelines, there are evident benefits of an early integration of biodiversity aspects at early stages of a plan or programme.

Moreover, it is SEA the only tool that serves as a mandatory requirement for several types of plans and programmes, where planners have to consider environmental aspects at the early stages of development *(European Commission et al., 2013, p. 16).*

The next diagram illustrates the overview and envisioned long term outcomes:

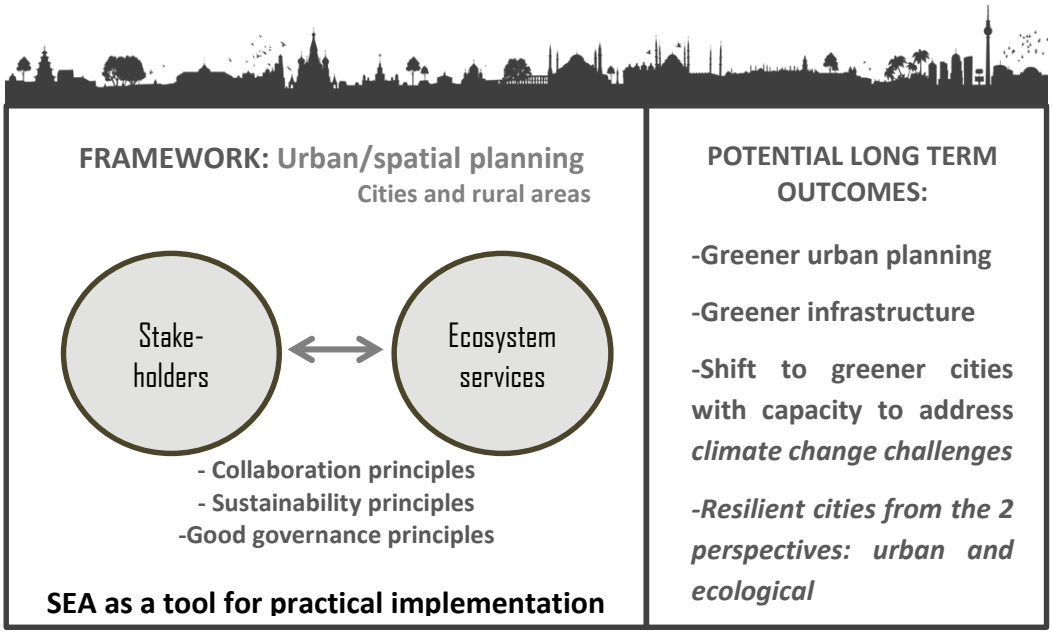


Figure 1. Inter-relations amongst subjects of this research

NOTES TO THE DIAGRAM:
SEA: Strategic environmental assessment
Source of the image of the city silhouette: http://www.cbobook.org/?r=1&width=1366

2 Theoretical framework

Argumentation

Considering that this is a problem-driven research, the theory selected to give a conceptual framework to every dimension of the work needs to be closely related to the main aspect of research, which is stakeholders. Moreover, due to the fact that the general context is urban planning and more specifically the environmental assessments, then it is concluded that Collaborative planning offers the proper perspective needed to frame this research from beginning to end.

There is one first affirmation which introduces this section in a simple manner: -*Collaborative planning implies good urban governance*-

2.1 Principles of collaborative planning

Regarding collaboration in the planning context, several aspects need to be considered apart from the most evident one, which is participation of the stakeholders, where consensus is desired but is not the only final outcome. The final result is the translation of those agreements into effective results. *(Richard D. Margerum, 2011, p. 4)*

Collaborative planning can be defined as a form of planning, which is based on some theoretical foundations of planning and *assumptions (Philip Allmendinger & Mark Tewdwr-Jones, 2005, p. 23)*. Moreover, the communicative planning theory, gives a platform to collaborative planning concepts. The next are the seven key messages of the communicative planning:

a) "*Recognition of the social construction of knowledge and the exercise of both practical reason and scientific knowledge*"
b) "*Acknowledgement of the different forms for the development and communication of knowledge (analysis, storytelling, expression*)"
c) "*Internal within social contexts acknowledged as of importance*"
d) "*Identification of diverse interests and the subordination of interests through relations of power*"
e) "*The concept of stake-holding, spreading ownership and the range of knowledge and reasoning*"
f) "*A shift from competitive interest bargaining to collaborative consensus building*"
g) *"Recognition of planning activity as being embedded in day-to-day relations; the linking of practice and context*"
(Philip Allmendinger & Mark Tewdwr-Jones, 2005, p. 26)

According to one of the references, four aspects conform the design of a collaborative planning process when nature is one of the main concerns. The coordination among them and good performance in each one will lead by principle to positive outcomes. The four perspectives which collaborative planning should achieve are the next:

1. Knowledge integration. Improvement of knowledge of the planning
2. Meaningful involvement. Support the involvement which is significant for stakeholders
3. Functioning governance. Need to be operational in the context and governance system
4. Sustainable use. Lead to a sustainable direction the new development

(Faehnlea & Tyrväinen, 2013, p. 334)

This methodology for implementation of collaborative planning was deducted from an extensive study of real cases of urban planning where natural resources had an especial interest. The point of departure is the targets of the collaboration need to be set, plus an early identification of who has the knowledge that is needed *(Faehnlea & Tyrväinen, 2013, p. 334).* The next model is developed by the authors of the mentioned reference, and illustrates in a summary how the interaction of the four key components is:

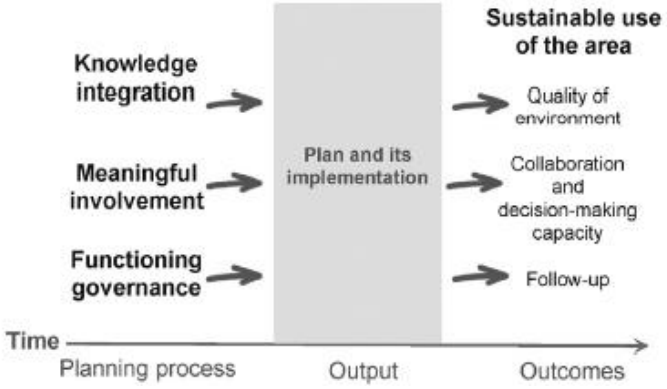


Figure 2 - Criteria for collaborative planning process – 4 perspectives
Source: Fig. 2 (Faehnlea & Tyrväinen, 2013, p. 337)

The good results of the collaborative planning depend on the contribution from participation, which results from knowledge building and complying with the condition that the process is meaningful for the participants *(Faehnlea & Tyrväinen, 2013, p. 335).* General aspects related to the concepts associated to the fourth perspectives are described below:

The knowledge gathered from citizens is classified as experiential information. It is commonly referred as data about local history, possible and desired future of the sites in development. Representativeness must be achieved in the process to guarantee a higher level of democracy and transparency in during the knowledge building stages *(Faehnlea & Tyrväinen, 2013, p. 335)* The type of methods and tools implemented to manage the communication for the process, play a crucial role in the quality and quantity of knowledge gathered through residents. There are diverse methods to review and study information gathered, which must be applied, among them there is the possibility of GIS-maps *(Faehnlea & Tyrväinen, 2013, p. 335).*

The central objective of the participation by local communities or non-experts actors lays on the possibility of acquiring new information, which cannot be obtained by other means. Therefore, methods for involvement need to look for quality of knowledge in this direction *(Faehnlea & Tyrväinen, 2013, p. 335).*

According to the same reference, there are characteristics that are desirable for a process of participation, such as: the efforts invested should compensate the data obtained*;* the involvement needs to be meaningful for every participant according to its specific situation, which implies that the possibilities and means for participation must be equal for any actor involved and that the process of participation is itself a learning opportunity for the participants; stakeholders learn about the initiative and about collaboration and governance; accessibility to information should be granted for the stakeholders; rules, conditions and expectations must be clear for every participant *(Faehnlea & Tyrväinen, 2013, p. 336).*

Regarding the **functioning governance**, the reflection is made with respect to the coordination between several departments and institutions or even several municipalities. Assuring that

budget and logistic are managed in an interlocked manner for the benefit of the initiative and the assessment. Collaboration needs to be functioning horizontally and vertically to provide an effective process *(Faehnlea & Tyrväinen, 2013, p. 336).*

The **final outcome** of the well-designed collaboration is the production of a better initiative such as: a policy, plan, programme or strategy; which was developed with consensus among stakeholders and the decision-makers supported satisfactorily. Besides, the initiative in turns contributes with the quality of the environment in the balance of the three dimensions: social, economic and environmental *(Faehnlea & Tyrväinen, 2013, p. 338)*.

Fairness, social justice and inclusiveness, are part of the values of collaborative planning. To finalise the conceptual description of the theory, it is worthy to mention the "Consensus building" idea. The decision should be taken with basis in the consensus that was achieved in the group of stakeholders, however, the planning is usually under the leadership of agencies or governmental bodies which need to meet other criteria, such as:

- They "*have to represent national interests, not just local*"
- They "*can be held accountable to elected officials, and through them, taxpayers*"
- They "*are bound by laws, regulations and precedents that stakeholders might chose to ignore*"
  (US Army Corps of Engineers, 2009, p. 25/47)

2.1.1 Collaborative planning model linked to SEA

Benefits from the public participation in SEA procedure has been recognised in previous studies, claiming for integrity and provisioning of reliable information for policies development *(Jones, 2005, p. 37).* If stakeholders express their environmental preferences and values during a SEA process, the potential conflicts of interests can be minimised; transparency of the process is favoured as well. Moreover, participation has been given the quality of facilitating the process of implementation of new plans, because the acceptance of changes is overcome through mediations carried in earlier stages *(Jones, 2005, p. 37).*

There are three different recognised levels for what collaborative planning must produce consensus in the phase of knowledge production. SEA through its stakeholder's participation serves as a mean to accomplish the task. The levels are the next:

- Regarding ambitions or/and interests of stakeholders
- Regarding interpretations and perceptions, including core values, of stakeholders
- Regarding accepted and credible facts of knowledge which can be taken into account
  (Van Buuren & Nooteboom, 2010, p. 130)

Moreover, the phase of research for the SEA alternatives/scenarios stage, plays a determinant role with respect to the level of credibility of results, where the quality of the data gives a

sense of trust among stakeholders as well as for the decision-makers. This point is relevant because stakeholders can also decide about which information is taken into account.

The public involvement according to the SEA Directive follows the next steps:

- Public announcement when process starts
- Environmental authorities and administrative bodies consultation for scoping
- Consultation in the first SEA report and draft of the initiative (PPP)
- Publication of the final report and initiative
- Public announcement about implementation of the initiative

(European Commission, 2001)
(Van Buuren & Nooteboom, 2010, p. 127)

I make a reflexion about how SEA and the model for collaborative planning, which was presented above, can support and complement each other. This analysis is shown below:

Knowledge integration:	Identification and valuation of Ecosystem services where stakeholders participate with inputs and perceptions. SEA Report consultation stage. Alternatives deliberation: proposals of stakeholders for compensation, replacement or avoidance of impacts on Ecosystem services.
Meaningful involvement:	Related with the public consultation: representatives from Local communities, business sectors, NGOs, ecosystem services final users, etc.
Functioning governance:	Coordination of institutions since beginning of SEA, later through the process, and at the end for implementation. The elaboration of SEA demands vertical and horizontal consultation and collaboration since early stages. Understanding and dealing with the dynamics of Ecosystem services requires coordination among actors, institutions, sectors, etc.
Sustainable use of the area -Outcome-:	Inherent to the nature of SEA. The search for sustainable development where the three pillars are balances is considered as one of the major advantages of SEA, expected as an Outcome. Ecosystem services approach implies balance among: economic, social and biophysical.

Figure 3 - Four perspectives of Collaborative planning and its relation with SEA/ES
Adapted by author

Moreover, according to literature related to public participation in the field on environmental assessments, which flows in line with the collaborative planning principles, it is worthy to highlight at least some of the main benefits derived from this practice:

- Contribute to conflict's mediation or mitigation
- Prevent or limit conflicts and opposition
- Create trust and understanding
- Creates a room for information exchange
- Builds the environment for knowledge acquisition and mutual learning
- Creates a bridge among governmental bodies, local communities and other actors

- Provides the bases for community engagement
- Fulfil legal requirements
- Evidences a more democratic action
- The decision-making process can be influenced by affected actors as well as by beneficiaries

(Olsen & Hansen, 2014)

The Millennium ecosystem assessment encourage actions of involvement of stakeholders in the decision-making process, it is particularly mentioned in its report related to Biodiversity Synthesis *(World Resources Institute, 2005c, p. 14).* However, every case has specific conditions, and levels participation vary according to the type of plan or policy as well as according to the site, needs, politics, geographical conditions, etc.

2.2 Tools for stakeholder's engagement

In first instance, a general classification of stakeholder's engagement tools is summarized in the next figure, grouping in three different categories, which is presented in the National ecosystem approach toolkit from UK, *(The NEAT - National ecosystem approach toolkit. UK, 2012):*

Category	Examples of tools	Comments
Survey based	Structured questionnaires Semi-structured interviews Focus groups	Gaining insight into people's attitudes, values, knowledge and behaviour
Deliberative	In-depth discussion group Citizen's juries Deliberative opinion polls	Developing reasoned assessments of an issue through group debate and learning
Analytic-deliberative	Participatory modelling Deliberative monetary valuation Deliberative multi-criteria analysis	Informing technical tools for decision-making through group deliberation

Figure 4 - Stakeholders engagement tools proposed by literature

Source: Table 1 (The NEAT - National ecosystem approach toolkit. UK, 2012, p. 2)

As a complement, a second classification of the same tools emerges from their functionality in the process of engagement. Having three groups for a sequential participation procedure: ***opening out tools, analysing tools and closing-down or decision-making tools***.

To acquire some illustration about the practical part of collaborative planning, below there is a description of techniques and tools for both, the participation and analysis stages:

Most common public participation techniques:

- Advisory groups/task forces
- Circles of influence

- Charrettes *(intense planning or design effort to solve a problem in a limited time. A design team takes ideas from the public and creates sketches with them)*
- Consensus conferences
- Focus groups
- Hotlines
- Interviews
- Meetings, hearings, workshops
- Surveys
- Visioning
- Web sites

(US Army Corps of Engineers, 2009, p. 21/47)

Practical techniques for stakeholder's analysis:

There are several techniques for management of stakeholders. Considering the complexity of the task when dealing with multiple interested actors, it seems the best way to make reference to stakeholders is by groups. Supporting the procedure in the classical tool where stakeholders are classified with bases in their influence and interest, the traditional proposed groups are the next:

Stakeholder must be	Monitored *-Lowest interest and lowest power-*
	Keep informed *-High interest and low power-*
	Keep satisfied *-Low interest and high power-*
	Engage closely *-Highest interest and highest power-*

Figure 5. Traditional stakeholders grouping
Source of table: (NIEP Built environment, 2014)

However, there is one more group to take into account in terms of stakeholders, this is related to -**Future actors**-, it is crucial to find the way to foresee the stakeholders who can play relevant roles in the future and related to the initiative that is in evaluation stage, it is particularly important to assess with relation to ecosystem services involved actors.

Additionally, there is differentiation of the levels of participation of stakeholders, and it has been recognised at least the next three: -Informing- which is one-way flow, -Consulting- where opinions of stakeholders are taken into account, therefore there is a flow in "two-ways", and -Real participation- where information is discussed and there are shared analysis and assessment (Slootweg et al., 2006a, p. 38).

Most common analysis techniques:

- Delphi — *"Experts respond to rounds of questionnaires, responses are summarized by a facilitator"*

- Screening "*reducing the number of alternative plans by eliminating those plans that do not meet previously agreed-upon criteria"*
- Scenario building *Prediction of future situation with a given set of assumptions*
- Building mental models *"the team develop a visual representation of the resource under consideration", to clarify and get "agreement upon a common mental model of how the natural system works"*
- Decision analysis Multi-attribute decision analysis

(US Army Corps of Engineers, 2009, p. 14/47)

There is another tool that has been served to build consensus among stakeholders as well as to help in the decision-making process, it is called "Trade-offs analysis", which has been used particularly for resilience in resource management; it works with iterative scenarios where weighting is applied to start deliberation which leads to a consensus *(RIU Research into use, 2014).*

Even though stakeholders analysis tools do not imply actions like mediation or negotiations, it can provide a platform for contributing with that, and the entire process of stakeholder's management can be carried out *(Reed et al., 2009, p. 1935),* taking care of each actor in its proper level and involving those which are key for the initiative.

In the Appendix No. 4, there is a more comprehensive description of tools and techniques for involvement and analysis of Stakeholders, which have been also used for SEA mainstreaming ecosystem services.

3 Methodology

This research project is developed on the basis of the constructivism paradigm, which can recognise more than one perspective of the "truth", and accepts that what is called reality is socially constructed *(Reed et al., 2009, p. 1936).*

The constructivism or interpretivist paradigm tends to construct the reality relying on what participants think or interpret about the situation on study *(Noella Mackenzie & Sally Knipe, 2006);* besides, theories are not the primary source for reality construction. Even though the current research is clearly framed in the theory of collaborative planning, the data collected and discussion is mostly based on people's opinions, which are given accordingly with their own experiences. There is also data gathered in SEA reports, this type of method is classified as -document reviews-. The primary methods of data collection in this research are qualitative; there is also data collected in a survey, which could be normally classified as quantitative method; however, for this particular case the sample tested in the survey is of moderate size, and still the main content is information composed by opinions of practitioners and experts in this topic.

The data collection methods associated with this paradigm are listed by literature: Interviews, Observations, Document reviews, Visual data analysis. The development of a research under

this paradigm is characterised by an attempt to develop a pattern of meanings *(Noella Mackenzie & Sally Knipe, 2006)*. In the concrete case of this research this pattern is: a set of observations and recommendations for carrying out SEA which can mainstream ecosystem services; this is what could be considered as the "truth" and final outcome.

The process of research follows the next sequence:

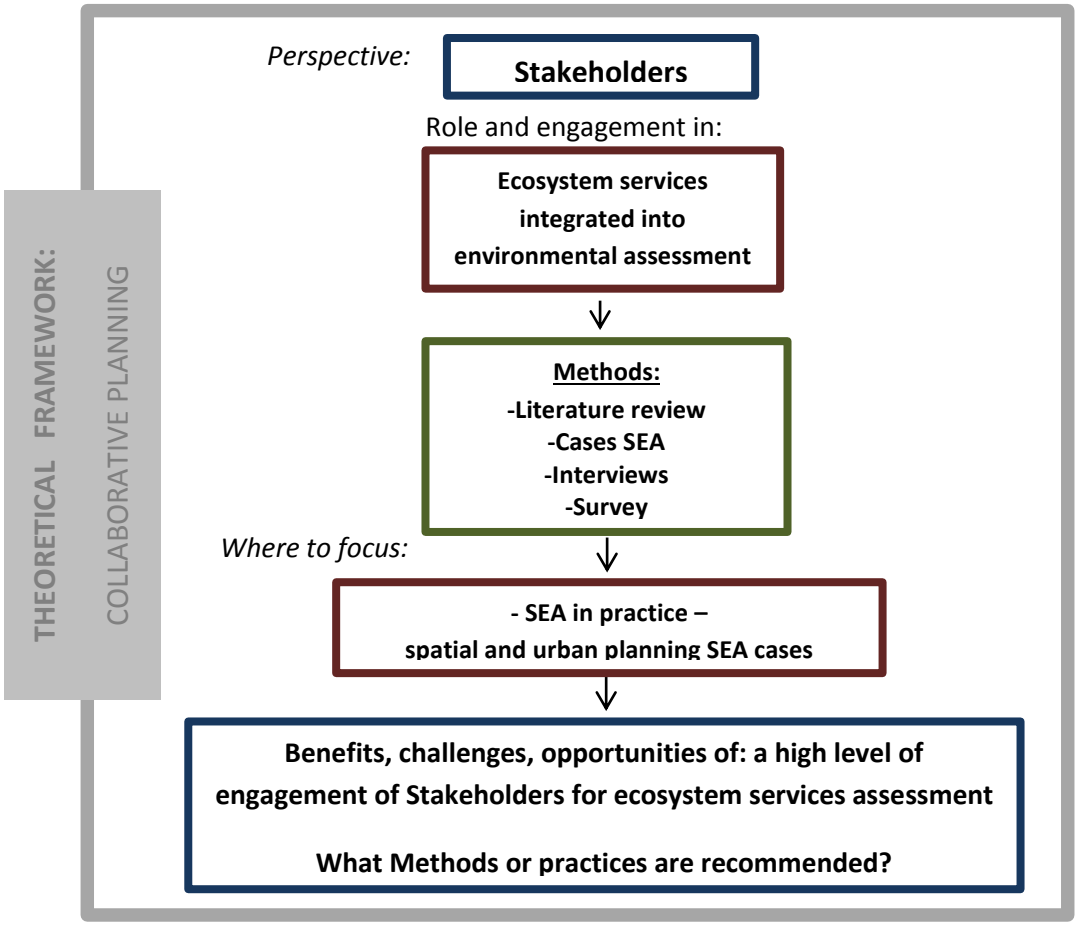
Through literature review the state of the art is determined. Which also helps in the selection of appropriate theories to make foundation for the research. The research starts by an extensive search in journals available in the internet, which is carried out taking advantage of some online platforms like *Science Direct, Taylor & Francis, Research Gate* as well as through *AAU online service library*, to get access to almost any international journals and books.

For this process of literature review, there are a series of preferred journals which publishes articles related to the topic and subtopics of this research, among them: *International Journal of Biodiversity Science, Ecosystem Services & Management, Impact assessment and project appraisal assessment, Ecology and Society, Biological conservation, Journal of environmental management, Journal of environmental assessment policy and management (ICP), Environmental impact assessment review, Management of Environmental Quality: An International Journal, Current opinion in Environmental sustainability, Environmental science and policy, Ecological economics, Landscape and urban planning, Ecological complexity, Agriculture, Ecosystems and Environment, Sustainable Cities and Society*

The criteria for the selection of useful papers is the next: filtering by topic, selection of articles which cover aspects related to the next combinations: stakeholders and ecosystem services; participation and ecosystem services; SEA and ecosystem services; SEA and participation; ecosystem services and urban, spatial and land planning; ecosystem services valuation and stakeholders; biodiversity and ecosystem services assessments; SEA and collaborative planning; SEA and biodiversity. As a framework for all combinations of topics: urban or spatial planning is preferred.

Besides, papers which were published in the last five years have priority, exceptions to this criterion are made if there is very relevant and precise information published before 2009. A large database of papers is collected and classified according to the main topic developed in each paper. Moreover, another classification is made according to the stage/chapter of the research where the information gives an input.

The next diagram shows the scheme of the research process:



SEA: strategic environmental assessment

Figure 6 Scheme Overview of research

What aspects of involvement are emphasised in this research:

- **Role of stakeholders with respect to ecosystem services**
  Stakeholders participate in the identification of ecosystem services as well as in the valuation stage. Stakeholders are seen as source of knowledge and management capacity *(Secretariat of the Convention on Biological Diversity CBO, 2012, p. 43). Stakeholders can influence decisions which have effects on ecosystem services.* The selection of the ecosystem services for the assessment is a task which requires attention *(Malinga et al., 2013, p. 1),* and the impact on the final outcome of the assessment can be important.

- **Role of stakeholders in urban planning**
  -Collaborative planning- as a theory for enhancing a better planning process. Stakeholders take an active role in the designing and planning of cities and surroundings as rural areas.
  From the collaborative planning principles: "*has demonstrated that increased participation with civil society has the potential to mobilize collective action to achieve strategic urban governance targets*" *(Elmqvist, 2013a, p. 329)*

- **Role of stakeholders in the SEA**

  One of the added values of SEA compared to other tools of assessment is the great ability to promote transparency, boosting equity and fairness. These benefits are possible in great extent because of the stakeholder's participation.

  According to Directive 2001/42/EC, there are several stages of the SEA when stakeholders are informed, consulted or/and involved in the process. It can also vary according to local regulation, and how the process of planning and the designing of the initiative for Development is conducted. This research is emphasising in high levels of engagement.

3.1 Research design

The next diagram summarise the research design, which has been explained in the previous section.

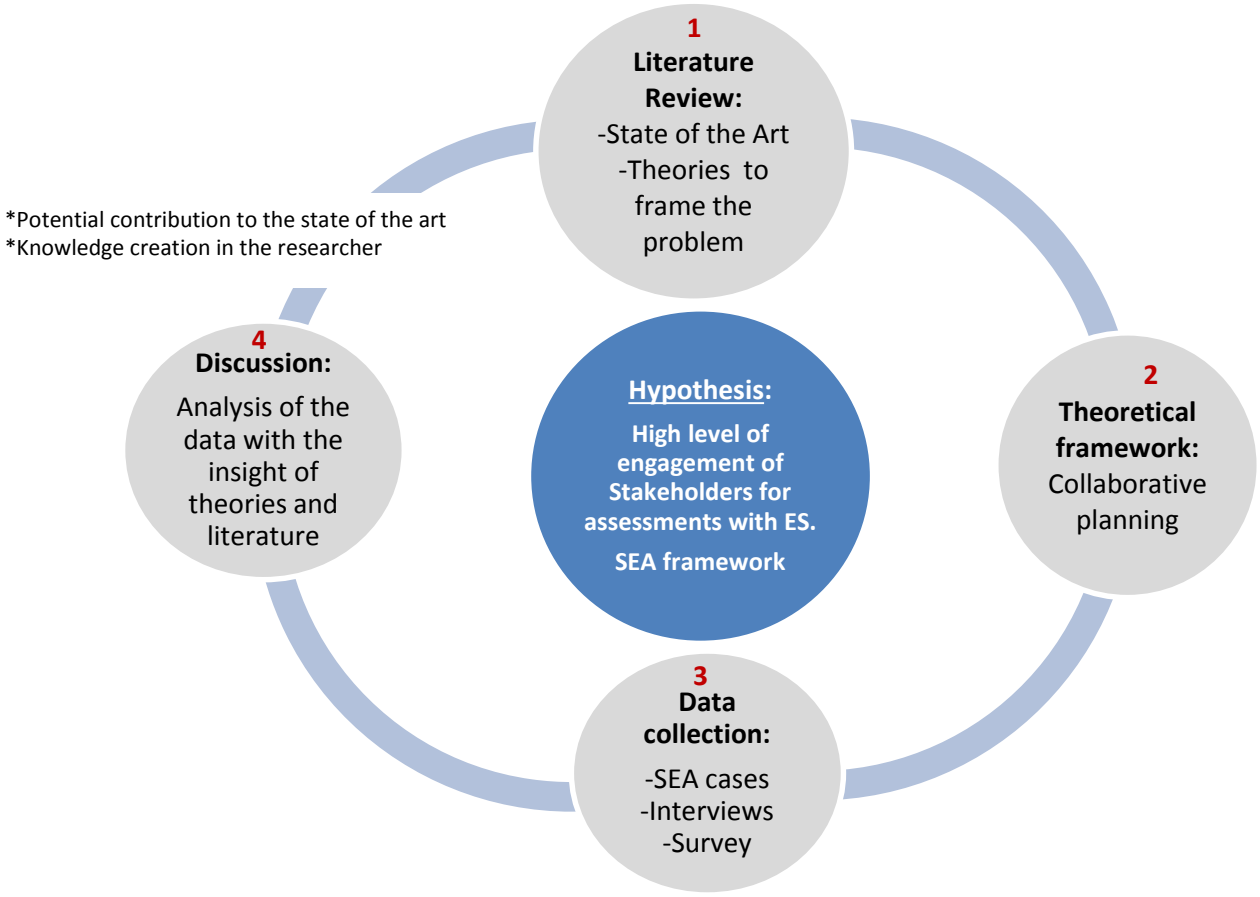


Figure 7 Research Design summary scheme

3.2 Description of methods

The methods for data collection for this research are primary qualitative. A survey is added with the purpose of collecting higher amounts of data in a short period of time. The analyses of this information is made with the assistance of M. excel graphs; as a result, a mix of qualitative and quantitative methods is applied. Below the methods are mentioned one by one:

1. Review of SEA reports of real cases

   The aim is to find SEA reports for plans or strategies for development, such as: city plans, spatial plans, urban and rural development plans, or even coastal plans which involve urban developments. The cases are selected from municipalities around the world, where ecosystem services and biodiversity have been integrated or emphasised in a special way; besides, the participation of Stakeholders plays a significant role.

   With the purpose of reviewing of the aspects related to stakeholders and ecosystem services, to detect difficulties and benefits in the assessment process and/or in the outcomes of the SEA.

2. Interviews to the experts

   According to the knowledge obtained by literature review and theories, plus information given by SEA reports, and the guidance related to the integration of ecosystem services, some reflections arise and make inspiration to formulate questions to the experts. Interviewees belong to two different fields: the academic and the practitioners.

   The information is gathered through semi structured interviews, or fixed written questionnaire for those who could not arrange an appointment for a conversation.

3. Survey among practitioners

   Additionally to the two above methods of data collection. A survey is carried out among experts in environmental assessments and ecology. With the aim of collecting more inputs from the perspective of these professionals, to find generalised trends regarding the challenges and opportunities of the engagement of Stakeholders for this specific type of SEA.

Description of the process for data collection:

1. Real cases SEA:

The process of search for the cases was carried out as follows: The first step was the identification of databases containing SEA reports which are collected by research institutes, governments, and/or development organisations. As a result, seven databases are collected from sites such as: *WBI (World bank institute), UNECE (United Nations Economic Commission for Europe), OECD (Organisation for Economic Co-operation and Development), SENSU (Environment and Sustainability research group, Instituto tecnologico Lisboa, Portugal), RSPB (The Royal Society for the Protection of Birds, UK), TEC (Treweek Environmental Consultants, England), The NEAT (The National ecosystems approach Toolkit – UK)*. The last source of cases is the guidance published by the European commission for the integration of biodiversity in the SEA, where relevant SEA reports are referenced.

Counting with approximately 90 potential cases which appeared as available from these databases, and which include cities, rural areas, coastal zones, etc., from all around the world. The following step is to look for other sources of information.

NIRAS A/S, gives support in this aspect. Several links and names of the cities in United Kingdom were provided through one of the professionals of the company who is an expert in assessments and ecological sciences. The information was given considering which of the known cases could probably serve as good examples of SEA mainstreaming ecosystem services.

Complementary, another search in google is made; the scanning is focused in municipalities development plans and ecosystem services in SEA reports. Moreover, two scientific papers provide examples of SEA cases: *(Partidario & Gomes, 2013)* , *(Honrado et al., 2013*).

Once a sufficient amount of cases is collected, the selection process starts based on the next criteria:

Selection of the SEA Cases criteria:

a) Development plans, programmes or strategies for municipalities
b) Biodiversity or Ecosystem services are especially emphasised *(restricted criterion)*
c) Any city in the world and no more than one case per country
d) Languages: English, Spanish, and as a last choice Portuguese
e) Stakeholders take an active role in the process, high engagement *(restricted criterion)*

From the initial list of cases six very relevant cases needed to be filtered due to the language of the reports and/or due to the early stage of the assessment, those were: *Alcochete Municipality, Tomar Municipality, Palmela,* and *Lisbon* from *Portugal*; *Plymouth* in *England* and *Durban* in *Africa*. Portugal offers good examples and cases of implementation of SEA mainstreaming ecosystem services, however all the information found for these cases was only available in Portuguese language, for this reason they were discharged as optimal data.

The next three reports comprise the selection of cases for the present research:

- **National Integrated coastal management strategy - ICZM Portugal – ecosystem services approach. Portugal**
- **The Ngqushwa Local Municipality plan (NLM). Spatial development plan. South Africa**
- **Scotland Rural development programme 2014 – 2020 – ecosystem approach. United Kingdom**

The first case was selected from the examples included in the Guidance for integration of biodiversity and climate change, published by European commission, being this one the one which mainstreamed ecosystem services. The second case was selected from the SENSU Portuguese research group database. The third case was found in the NEAT database.

With respect to the second case, in South Africa, the integration of ecosystem services is not as emphasised as in the other two, however this case is relevant mainly for the next two reasons: First, the municipality faces economic depression and strives for boosting its economic growth, to reach this aim they need to enhance and protect the ecosystem services provided by the nature, therefore the ecosystem services are recognised and included in the assessment as a source of economic development. Second, this case has particular issues with the Stakeholders engagement, and makes specific emphasis on this, which I found worthy for this research.

2. Interviews:

The interviews are valuable to count with the opinion of experts who are currently dealing with the issue and need solutions for their professional performance. The purpose is get confirmation and complementary information from what is gathered in the survey and what cases expose. Besides, questions are formulated after reflections made during the process of research. The interviews were intended to be semi-structured, however only two of them were made in this way and the rest of the information was gathered in written communication.

Criteria for the selection of the interviewees:
The interviewees are chosen from two different fields, academic and practitioners.

- 2 experts in the academic field
- 2 experts in the practitioner's field

a) Interviewee **Type 1**: Expert in the academic field
- Must have published scientific papers in renowned journals
- Can have experience in contribution for chapters, books or guidance related to the subject
- The person is recognised as a researcher

The expertise subjects are: SEA, ecosystem services, environmental assessments, and possibly urban and/or spatial planning

b) Interviewee **Type 2**: Expert in the practitioner's field
- Have carried out SEA
- Have worked as a planner and/or has experience with urban ecology
- Have worked in assessments related to urban ecology
- Works for a well-known consultancy company
- The person is a recognised professional in the company

The expertise subjects are: SEA, ecosystem services, ecology, and possibly urban planning

List of interviewees:
The interviewees for this research are listed below with a brief introduction about who they are, which explains why they are important for the process of data collection:

- Professor Maria R. Partidario

Instituto Técnico de Lisboa IST. Portugal

Mrs. Partidario is a recognised researcher in the field of SEA and lately in the fields of integration of biodiversity and ecosystem services in assessments procedures. She has had important positions in diverse institutions such as: -Instituto Técnico de Lisboa- IST (University), IAIA, Green Globe International. She is the coordinator of the Master on Environmental Engineering IST. Head of the Research Group: SENSU - Strategic approaches to ENvironment and SUstainability. She has supported projects on Strategic Environmental and Sustainability Assessment, published several number of papers on the same fields, author of several guidance for SEA and participated in the edition of the Guidance for integration of biodiversity and climate change in SEA.

- Researcher Davide Geneletti

University of Trento. Italy. Urban Ecology field

Mr. Geneletti is a researcher in Environmental assessment and Environmental planning at the University of Trento. His expertise is in SEA, EIA, ecosystem services, land use planning and spatial decision analysis, integration of ecological concerns in planning, through ecosystem services, supporting decision-making in policy, planning, design, using multi-criteria analysis and GIS.

The person was contacted in middle May, and shortly after he accepted to be interviewed; however, after this first contact and delivery of questions, it was only possible to get a second answer from him at the end of the month; the interview could not be arranged but he sent his inputs and answers via email. There is complementary information that he will send to me once it is published, if this happens before the oral exam for this research it might be included as part of the discussion.

- Professor Marina Bergen Jensen

University of Copenhagen. Department of Geosciences and Natural Resource Management, 'Landskabsarkitektur og planlægning'. Denmark

Mrs. Bergen Jensen "*is professor of Design and Construction of Urban Landscapes Adapted to Climate Change. She holds key competencies within water quality management by use of green technologies, and within stormwater management by use of the urban landscapes. She has invented the patented water treatment technology Dual Porosity Filtration, and is running three larger national research projects, all dealing with climate change adaptation of existing urban areas by use of the urban landscapes, the total KU-LIFE budget representing approximately 2 million Euro. She is responsible for a masters course, 'Urban Ecosystems - structures, functions and design*", *Source: University of Copenhagen website, Research section*.

The person was contacted in middle May and a first reply was only given at the end of the month; the interview could not be arranged and she replied again with the intention to give her inputs and answers via email; however, when the final edition of this report was made there was not a new reply. In case she can manage to send her inputs, then it would be clarified in the final presentation of this research.

- Consultant Mike Barker

Technical Director UK. NIRAS A/S

Mike Barker is an ecologist with more than 20 years of ecological and environmental management experience. Mikes' experience has been focussed on the strategic planning and delivery of infrastructure and utilities assets. His main areas of ecological experience are in coastal, terrestrial and freshwater aquatic environments including wetland birds; and habitat management advice and planning. Amongst his key areas of expertise are: Ecological Impact Assessment and EIA project management. Protected habitat and species evaluation and assessment and Strategic Environmental Assessment of plans, policies and programmes. *Source: professional CV.*

- Consultant Lene Lang Gamborg

Team Director DK. NIRAS A/S

The interview with this professional from NIRAS needed to be postponed after the 2nd of June. The data which could be obtained would not change in a significant way the content of the discussion and conclusions; even though, I could have got confirmation in some aspects or get new insights from the point of view of the practitioners. However, due to the time for submitting the thesis, this cannot be added to the report, and the information will be considered for the time of the oral exam and the presentation of this research.

Unsuccessful interviews:

Apart from the above mentioned, there were two persons who were contacted with the purpose of interview them, and the next are the causes of failure in the process:

- Erik-Gómez-Baggethun

Barcelona University researcher. Spain. Economics and Ecosystems field.

He was included in the list of potential interviewees, at the same time he was also asked by the master coordination to be a co-supervisor of this research project, which would make him no able to be interviewed. However, this action was made very late in the semester, for this reason and other unexpected situations with the report, it was not possible to settle an agreement with him. No even the interview was possible to be scheduled because he did not have time for this activity.

Gómez-Baggethun is a recognised researcher in the field ecological economics and political-ecology, integrated assessment of ecosystem services, and resilience theory. Has published about 20 articles and participated in book chapters. He participated in the report of 'The Economics of Ecosystems and Biodiversity' (TEEB) and in URBES project.

- Inge Røpke

Professor of ecological economics at Aalborg University, Copenhagen.

Mrs. Røpke was contacted because of the ecological economics background, however she replied that her expertise was not closely related to this research project, besides she was very busy for an interview.
Mrs. Røpke is economist and holds a PhD in social sciences. Her expertise is in research modern ecological economics and various related topics such as trade and economic growth. Specialized in the ecological economics of consumption and written about environmental aspects of technological change in everyday life.

Interviews are included in the Appendix No. 1 of this report, including questionnaires and answers.

3. Survey:

A questionnaire created in the platform Google Drive with 5 main questions, including multiple choice and scale-ranking statements, plus one optional open question. The target group was professionals, practitioners with experience in environmental assessments.

The questionnaire was shared in five different "*Linkedin*" groups, which are all specialised in the environmental field, below is the name of the groups and the information about the number of members:

- Environmental impact assessment: 27.474 members, closed group
- CIEEM (Chartered Institute of Ecology and Environmental Management): 3.308 members, closed group
- Consultores latinoamericanos en temas ambientales: "*Latinamerican consultants for the environment*": 10.500 memebers, closed group
- Biodiversity in a rapidly changing world: 3.555 members, closed group
- Biodiversity, Economics and Finance: 2.135 members, closed group

The questionnaire was explicit in asking that only professionals with experience in environmental assessments should give their inputs. First, the respondents were asked to define how the engagement of stakeholders could affect 6 different aspects of SEA and the implementation of PPP. The three levels of scale given were: *low impact, medium impact, high impact.* The criteria or aspects ranked were the next:

1. To reduce conflicts or resistance against policies, plans and programmes (PPP)
2. To aid in adapting local communities in the implementation of new PPP
3. To identify the ecosystem services which are possibly impacted by the PPP
4. To make the valuation (monetary and non-monetary) of the ecosystem services which are possibly impacted by the PPP
5. To acquire knowledge about ecosystem services dynamics or interactions within themselves
6. To make well informed and more democratic decisions

Besides, the survey enquired about the two largest downsides of having high level of stakeholder's involvement in environmental assessment which are mainstreaming ecosystem services.

In total 15 answers were obtained in a period of three weeks; however, one response was annulled because it contained exactly the same information as the immediately previous one, it seems that the respondent sent his/her answers twice.

In the Appendix No. 1 a copy of the questionnaire and the datasheet with the results are included.

- **Information about respondents**

Four questions of the questionnaire enquired about the respondent's background and experience. Once the survey was carried out, the next information was collected regarding the respondents background, years of experience and country where the experience was gained.

Experience in Environmental Assessments:
How many of the respondents had experience in each of these types of assessments:

Type of Assessment	Total
Biodiversity or Ecosystem Assessment - BA	10
Environmental Assessment (general terms) - EA	12
Environmental Impact Assessment - EIA	13
Strategic Environmental Assessment - SEA	9
Sustainability Appraisal - SA	2

Country where experience was gained/Background/Range of years of experience:
Respondents were mostly well-experienced in the topic, and the countries of origin were very diverse, from all around the world.

Respondent's Country experience. Background and years of experience
Belgium
Environmental engineer
More than 10
Brunei, indonesia
PhD Climate Science
Between 5 and 10
England
Ecologist
More than 10
Europe, Malaysia MENA
Ma Conservation
Between 3 and 5
Global
Environmental Economist
Between 5 and 10

Ireland, UK
Environmental Biologist
More than 10
italy
urban planner, oil and gas impact assessment
More than 10
Lao PDR
Natural Resources Management
Between 5 and 10
Malta
Geology/hydrology
More than 10
Mexico
Biologist, Ecologist, Environmental Science
More than 10
New Zealand
Ecologist/Analyst - 1 PGDip, 2 Masters, PMP(accredited)
Between 5 and 10
South Africa; Mali; Botswana
PhD Zoology; Environmental Management Systems; Rehabilitation of Mining Sites; Environmental Impact Assessment; Water Resource Management
More than 10
U.S.A.
M.S. Civil Engineering
Between 3 and 5
Uganda
Environmental scientist
Between 1 and 3

Additional information about the questionnaire and answers can be read in the Appendix No. 1 and in the Chapter No. 4.

3.3 Validity and reliability

Triangulation is used in this research to add validity and reliability to the information gathered through different sources. Therefore, for this research three different methods of data collection are combined. Data from the interviews and data from the survey are complementary or confirmative to each other. Besides, these two methods give deeper understanding about the information that is obtained in the literature review. The interviews and the survey also provide more accurate information, plus adding confirmation to what can be extracted from the SEA cases. Nevertheless, SEA cases are an important basis for the elaboration of questionnaires, since questions arise accordingly to findings in literature review and cases.

Regarding the survey and its validity the next was considered: the design of the questionnaire must strive for achieving good quality of information which reflects several types of validity, such as: *face validity, content validity, internal validity and external validity*. The first one refers to the formulation of the questions to obtain the desired data. The second deals with the

ability of the survey to cover the topic of research in a complete manner. Internal validity states if the content of the survey give inputs to the outcome of the research; and the external validity refers to how much generalisation can be made from the sample used in the survey. *(Relevant Insights, 2009)*

Moreover, the sources of information of the present research are truthful and genuine, then the results are expected to be credible.

3.4 Limitations of the research

A relevant issue is related with the language of research and my knowledge in languages, which constrain the origin of information and limit the literature review search. There is a bias in the searches which is mainly done in English, combined in some extent with Spanish. There is a higher number of publications in English and as a consequence also the quality of information is better in this language. For this reason the language used for literature review is basically English. It leads to omit information which could be published in French, Italian, Portuguese, German, etc., and going further, Chinese, where SEA is currently in a peak of implementation. Therefore, restriction to materials produced in native languages is a fact, and experiences from several countries have to be omitted.

Regarding Portuguese language there is an especial issue: Portugal is a country with great advance in the topic of study, Professor Maria Partidario, specialist in the field of SEA is originally from this country, and main investigations have been done and published in native language. Portuguese is a third language for me in which I am not fluent, even though I can understand and read a great percentage without translating tools.

This research does not have a narrowing down in any specific region or continent. I decided to leave open this aspect, especially for the search of SEA reports integrating ecosystem services, due to the fact that this kind of approach is relatively new and it is not spread in the practice.

4 Data and Analysis

The data which is gathered through the three main methods of data collection is summarised in the next subsections.

From SEA reports, I present a short description of the case, the site, and the SEA approach; then aspects related to ecosystem services, ending with the highlights associated to stakeholder's engagement. From the data gathered in the interviews, I include what seems more impressive and has been unknown for me to this point of the research. Regarding the survey, the graphs that are presented in this chapter summarise most of the information. The Appendix No. 1 contains all the interviews and datasheet from the survey.

4.1 Data from SEA cases

A. Strategic environmental assessment for the integrated coastal zone (ICZM) – Portugal

General Description of the case and site:

The SEA for the ICZM was carried out in a voluntary basis, since policies are included in the list of mandatory initiatives which need SEA in the European Union.

The ICZM had at least the four objectives listed below, with an overall goal of creating balanced and coherent strategies for the development of the areas in the coastal region of Portugal. Strategies which met the demands for ecosystem services from different economic sectors *(Maria Rosario Partidario, 2010, p. 1).*

- *"Managing impacts of climate change and safeguarding resilience of coasts/coastal systems"*
- *"Integrating coherent strategies covering the risk-dimension (prevention to response) into planning and investment"*
- *"Sound use of resources and promotion of less resource intensive processes/products"*
- *"Balancing economic, social, cultural development whilst enhancing environment" (European Commission, 2010, p. 1)*

In summary, the SEA aimed to achieve: *"sustainable management of human activities in coastal areas to safeguard the integrity of ecological systems, the recognition of ecosystem services, the sustainable use and management of coastal resources, the avoidance and minimisation of natural and technological risks and the adoption of governance approaches for sustainable and integrated coastal management" (European Commission, 2010, p. 1).*

The site:
This coastline provides great landscape quality, as well as bio-geographical and geo-morphological variation. Length: 1187 km. "*Human occupation affects the coast line in two main forms: along river basins, increasing the sedimentation rate at the mouth of rivers, and by direct occupation in large sections of the coast*". 75% of the population in Portugal live in the coastal areas, besides, this people are the responsible for the 85% "*of internal gross product through urban and industrial activities, intensive tourism, rural activities and fisheries*". Portugal has an enormous potential of maritime resources. *(European Commission, 2010, p. 1)*

Environmental facts:
"*Over 30% of the coast line is legally protected as a natural area within the National Protected Areas network.* "*50% of the area is statutorily integrated in Natura 2000*".
This coast is vulnerable to natural risks, like tsunamis, coastal erosion, "*sedimentation deficit in the continental platform, coastal areas flooding, loss of biodiversity, increase in salinisation of estuarine and ground-waters*" *(European Commission, 2010, p. 1)*

"*Ecosystem services were identified that could be affected by policy choices, including: the management of natural coastal dynamics, especially in vulnerable zones; the maintenance of*

the productivity of coastal zones; the maintenance and conservation of the availability of natural and cultural heritage and biodiversity; the sustainable use of resources and the management of coastal risks (for example erosion, coastal stability, sea level rise etc.)" (Maria Rosario Partidario, 2010, p. 1)

Year of assessment: 2009

Highlights on stakeholder's involvement

According to previous studies made on this case, this was a successful implementation of SEA. An illustrative example of good governance, which showed that SEA can make possible and facilitate integrated and sustainable decisions in the policy level. Demonstrated that SEA and policy-making processes can achieve mutual benefits.

Stakeholders were involved in the process for discussions and they provided crucial information which only could have been obtained through them. However, participation was limited, reducing stakeholders to mostly public institutions in the regional and national levels *(Maria Rosario Partidario, 2010, p. 4).* The studies made on the case states that public participation could have been greater. Even though, the SEA influenced the PS-ICZM in a strong way *(Maria Rosario Partidario, 2010, p. 1).* The reason for this was the short time that was available for the preparation of both, the strategy and the SEA.

To compensate this lack of participation in the elaboration stage, a special open discussion session was organised to be held in the stage of implementation, with the purpose of cross-relate and match different points of view and finally improve and enrich the strategy *(Maria R. Partidario, Vicente, & Lobos, 2009, p. 1275)*.

The SEA assisted to draw the strategy and one of the priorities was to shape it with a model of governance, based on partnerships between the public and private sectors, as well as institutional coordination. The services provided by the coast are then shared in a coherent and compatible way by the stakeholders and different sectors.

The opportunities identified in the participation were the next: to strength the dialog, to avoid potential conflicts, and to utilise collaboration processes for solving tense situations or solving conflicts. As challenges and risks, the des-centralisation of the information, allowing a larger participation from non-institutional stakeholders.

<u>All the information related to this case is extracted from the next sources:</u>
(*Estratégia Nacional para a Gestão Integrada da Zona Costeira. Avaliacao Ambiental Estrategica. (A. Strategic environmental assessment for the integrated coastal zone (ICZM))*, 2009)
(Maria R. Partidario et al., 2009)
(Maria Rosario Partidario, 2010)
(European Commission, 2010)

B. Strategic environmental assessment for the Municipality of Ngqushwa, spatial development plan – South Africa

General Description of the case and site:

The municipality of Ngqushwa (NLM) is located in South Africa in the coastal zone surrounded by natural resources, and counts with important number of environmental assets. The pressures over the natural environment are several; about 84.000 inhabitants in the zone.
Large amounts of people living in the area because of historical factors, and who are deprived *"of access to agricultural markets, forced them to engage in migrant labour and systematically withdrew and withheld financial investment from the area. Pressure on the coastal environment is also growing due to an upsurge in residential and tourism related* development interest." *(Coastal & Environmental Services, 2005)*
Poverty levels in NLM are high, about 78% of the population live below of the poverty line.

This type of SEA is classified as 'geographical SEA', which emphasises in the development and land-use of a region, the development plan studies aspects as infrastructure, poverty alleviation, urbanisation housing solutions, agriculture activities, tourism, etc. The main objective of this SEA was: "*an assessment of the environmental constraints and opportunities and integrate this information into the formulation of sustainable land-use plans and programmes for Ngqushwa Municipality, including spatial planning" (…) "such land use plans will need to meet the criteria of ecological, social, economic and institutional sustainability*."

The development plan is elaborated for urban, peri-urban and rural zones.

Year of assessment: 2005

Due to the high level of poverty in this region, it is basic to boost economy based on the natural resources available. Services linked to agricultural production, fishing, and aquaculture. There is a high scarcity of water in South Africa, therefore services associated to water are highly vulnerable and need special attention in the SEA.

There is one specific ecosystem in the area which is integrated in the assessment due to its importance for the development of the municipality, it is The Thicket vegetation ecosystem. There are all types of services derived from this resource, such as: commercial activities, protection of soils from erosion, good quality of water, clean air, natural -air conditioner-, eco-tourism, hunting, horticultural and medicinal plant industries. Tourism based on the natural landscape and coastal zone, is a service which is carefully evaluated because of its potential for as an opportunity for economic and social development.

Highlights on stakeholder's involvement

The assessment is led by principles of integrated environmental management, which implied informed decision-making process as well as open and participatory approach to planning. The practical implementation of participation was made through meetings and workshops.

Since an early stage this SEA had a participatory approach and local communities were invited. This approach was defined in key steps and the next two are worthy to be mentioned:

- "*Involvement of key stakeholders, authorities, role players and communities in identifying a vision, priority issues and strategic choices for the NLM*"
- "*Technical and specialist inputs to evaluate alternatives and potential conflicts and synergies (opportunities) in NLM*"
  (Coastal & Environmental Services, 2005, p. 14)

The SEA is framed by four principles of sustainable development, being the last one Governance and institutional sustainability, which enhances participatory decision-making. This SEA recognises the engagement of stakeholders as a cornerstone of the process and three objectives related to this theme were established:

"-To conduct a transparent and inclusive SEA process that identifies and addresses the needs of all identified stakeholders.
-To actively engage all stakeholders to the extent practicable to encourage an open exchange of information, ideas and concerns, throughout the process of the SEA.
-To build capacity in local and regional institutions through increased knowledge of sustainability concepts and user-oriented products that guide sound decision-making practices."
(Coastal & Environmental Services, 2005, p. 21)

The opportunities identified of the participation are the next: to generate and broaden ideas, to create higher satisfaction with decisions, to reduce dependency when people have been involved in the decision, for transferring skills for income generating purposes, to introduce local knowledge and understanding of local needs, to contribute to capacity building.

There were obstacles for the participation, such as: illiteracy; lack of access to communication services; lack of access to the report; restrictions for the local community to express their opinions, which is due to lack of resources like time and money; that enable them to reach means for making this communication; lack of knowledge of environmental issues. The advertising methods were not ideal to reach the local communities and some local actors. The logistic for meetings, such selection of venues, should have considered with higher priority the distance to homes of local peoples participating in the process.
As challenges: longer time should have been given to the process of participation; empowering the communities should have been assigned as a task in a specific stage of SEA, dividing the participation in several steps and work in a framework of learning process with stakeholders.

<u>All the information related to this case is extracted from the next source:</u>
(Coastal & Environmental Services, 2005)

C. Strategic environmental assessment for The Scottish Rural Development Programme (SRDP) – United Kingdom

General Description of the case and site:

Scotland's land area is approximately 78,722 km^2 including islands. The population is approximately 5.2 million people. Rural Scotland represents 94% of the land area and is home of approximately 1 million people, about 18% of the population.

The rural land in Scotland supports activities and ecosystem services such as: energy production, water management, landscape and tourism. Besides, the ecosystem functioning is key for the biodiversity conservation of the country.

Four alternatives were evaluated against the SEA headline objectives, for what the causal chain analysis was used. This SEA follows the recommendations of the 2020 EU biodiversity strategy, adopted by European commission in April 2012. Besides this SEA is based in the ecosystems approach and evaluates the effects directly in the ecosystem services.

Year: 2014

The ecosystem services were included for evaluation in most of the key aspects of the baseline, such as: Biodiversity, water, soil, population and human health, waste and resources, Cultural heritage and landscape; only in the two next aspects -Air- and -climatic factors-, there was not specific inclusion of ecosystem services evaluation.

"*It was felt that the SRDP SEA should pay particular attention to regulating, supporting and cultural services due to their importance and their lack of consideration within other aspects of the SRDP process, although there is a role also for protecting provisioning services within the SEA given the importance of links through the food chain*"
(Collingwood Environmental Planning & Agra CEAS Consulting, 2014c, p. 22)

The report acknowledges that through the provision of ecosystem services the zones can develop resilience to climate change factors. Besides, cumulative effects are evaluated with basis in ecosystem services, plus the use of causal chain analysis. Tourism is seen as an opportunity for development, based on the natural landscape and cultural heritage.

Highlights on stakeholder's involvement

Initially a scoping meeting was held, where a planning team, the environmental authorities and other actors participated. Additionally, for the elaboration of the scoping report the stakeholders were asked to give inputs about the inclusion of ecosystem services as part of the assessment. In total eight organisations, agencies and bodies participated in the scoping consultation. The answers to the questions and comments were considered in the final version of the SEA approach. The objectives and final approach of SEA were influenced with this consultation.

Stakeholders gave positive opinions and ideas about how to include key ecosystem services in the objectives of SEA. Besides, stakeholders highlighted that some other services which obtained from archaeology or heritage, should be also taken in consideration. Stakeholders gave relevant inputs about the evaluation of cumulative effects.

All the information registered for this case is extracted from the next sources:
(Collingwood Environmental Planning & Agra CEAS Consulting, 2014a)
(Collingwood Environmental Planning & Agra CEAS Consulting, 2014b)
(Collingwood Environmental Planning & Agra CEAS Consulting, 2014c)

4.2 Data from interviews

Highlighted inputs:

- Professor Maria R. Partidario

"*… engagement of stakeholders in terms of time, it might be longer in the beginning but it might save time later; however, there is not evidences to demonstrate that…*"

"*If we prove that this can be beneficial then people will run for it, if they realise that this can bring benefits but if they only see that this costs more then it will not be taken*"

"*if this is going to be applied in countries where the culture or politics prevent a good involvement of stakeholders, or transparency and dialog are not allowed, then it would be hard to apply this methodology*"

"*If you are involving stakeholders they are in the capacity to identify new ways that permit to avoid the impacts on the ecosystem services*"

- Researcher Davide Geneletti

Integrating ES into SEA gives a more holistic framing of the impacts of the strategic actions.

SEA can even explore alternatives to enhance ecosystems conservation and their ability to deliver services, instead of the classical approach of minimization of negative environmental impacts.

A downside is the overlapping between ecosystem services and other "traditional" components addressed in SEA, this may cause confusion in stakeholders as well as repetition of efforts.

- Consultant Mike Barker

Knowledge contributions from several actors are valuable especially to find aspects that cannot be anticipated by the team which is carrying out the SEA. It is more sensible to have the contribution from other experts and participants, and in the early stage.

The technique of -User Types- where stakeholders like local communities can be identified and participate expressing their needs in this way.

Through participation of local communities it is possible to know what people need from nature in the way of ecosystem services.

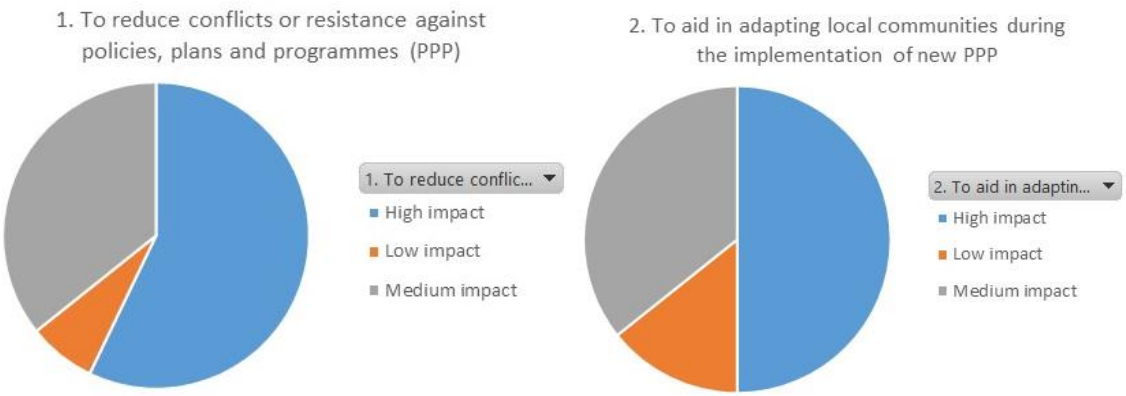
Stakeholders can also participate after implementation, as example of this, the -PES- payments for ecosystem services are needed to be established for the nature resource management.

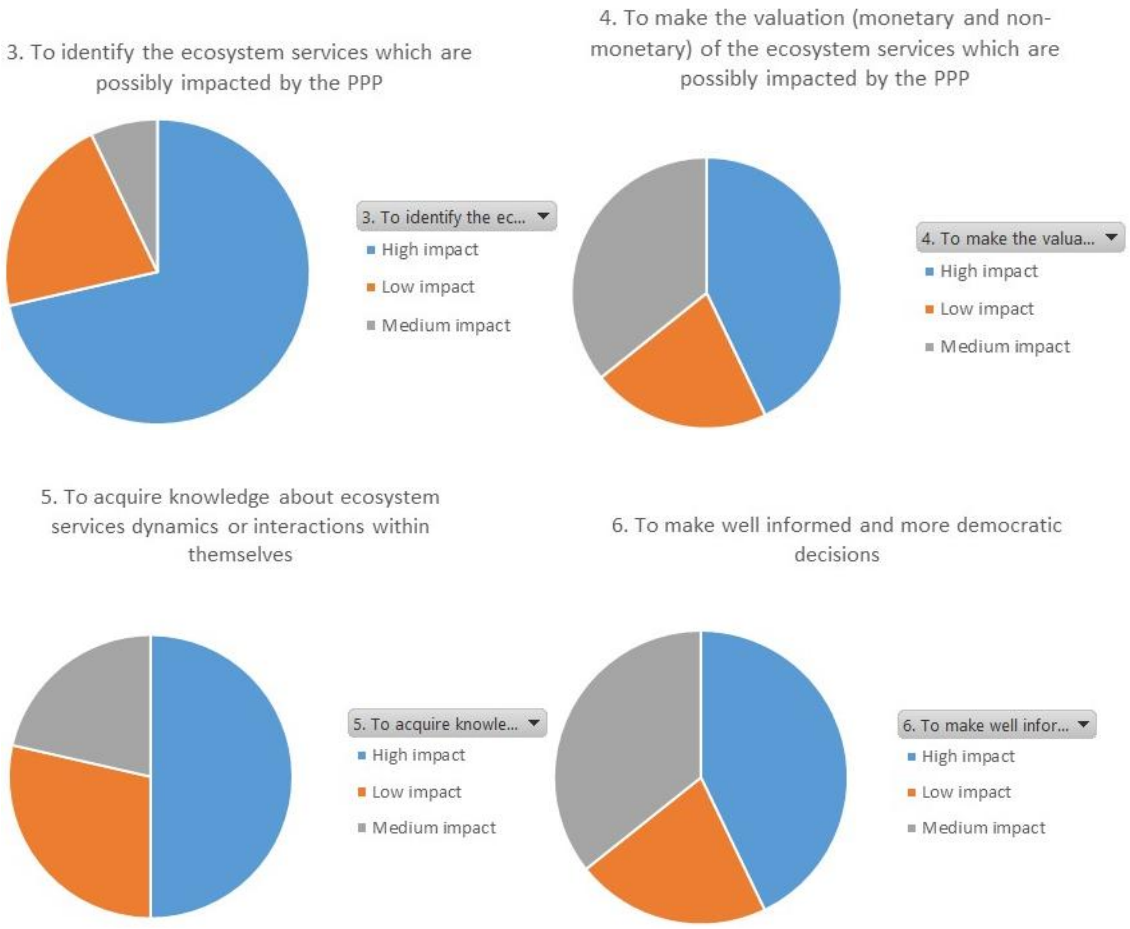
4.3 Data from survey

Below are presented the graphs which summarise the results of the survey.

1) Stakeholders increased involvement can contribute with:

1. Reducing conflicts or resistance against policies, plans and programmes (PPP)
2. Aiding in adapting local communities in the implementation of new PPP
3. Identification of the ecosystem services which are possibly impacted by the PPP
4. Making the valuation (monetary and non-monetary) of the ecosystem services which are possibly impacted by the PPP
5. Acquiring knowledge about ecosystem services dynamics or interactions within themselves
6. Making well informed and more democratic decisions





For all the aspects assessed in this question, the respondents agree by majority on a -high impact-; stakeholders increased involvement definitely has effects on these aspects. Moreover, for most of them the at least 50% or more think the same. In contrast, the -low impact- represents about 25%, as maximum of the total. These observations lead to find what benefits are gained from the high level of engagement of stakeholders. The most impacting aspect is the first one: *–To reduce conflicts or resistance against policies, plans and programmes (PPP)-*, where the low impact was considered nearly zero.

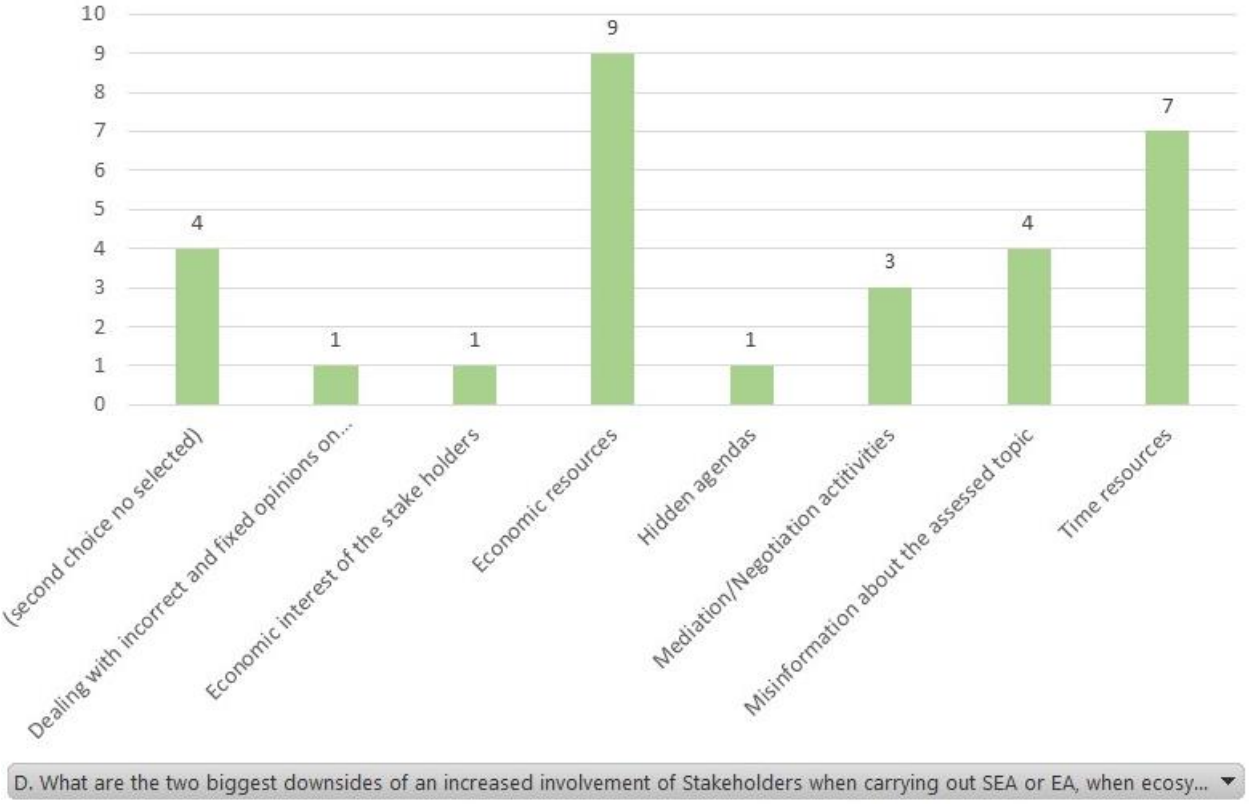
2) Downsides of the increased Stakeholder's involvement

Respondents were asked to select the two major downsides of the increased stakeholder involvement from the next list of potential downsides:

- Time resources
- Economic resources
- Mediation/Negotiation activities
- Misinformation about the assessed topic
- There are not downsides
- *Other:*

A total of four respondents did not selected a second downside but only one. There was not selection of the choice "There are not downsides"; and the three new suggested downsides were the next:

- *Dealing with incorrect and fixed opinions on ecosystem services from stakeholders*
- *Economic interest of the stakeholders*
- *Hidden agendas*



The two biggest downsides of the increased involvement of Stakeholders in the SEA, when ecosystem services integrated are the next:

- **Economic resources**, which is related to the additional economic resources needed to invest in the process.

- **Time resources**, which is related to the extra time that needs to be invested in the SEA process. This factor has a side effect in the economic resources.

The aspect -*misinformation about the assessed topic*- occupies the third place on the ranking.

Complementary, the open question of the survey returned valuable information, mostly considering that the respondents are specialists in the field and most of them registered about 10 years of experience in environmental assessments. In the Appendix No. 1, the most significant comments are included in a separate page. The country where the assessment is

carried is definitely a key aspect to consider, it is mostly evidenced in the answers from Uganda and South Africa, which reflect an opposite point of view compared to the others.

Below, there are few of the comments, selected accordingly to the influence that have for the conclusions of this research:

Highlighted Perceptions:

"Stakeholder engagement is still perceived as a loss of time and a risk for investors. On the contrary, to know in advance potential risks and ecosystem services can be an advantage also for the strategic planning of the investors. Once a client said: "I do not want to let people know too much at the design stage of the project, I do not want a bomb to explode". The social consultant replied: "if there is a bomb, wouldn't you know in advance where is it?"

"I would consider that the increased resources, i.e. time taken in adding additional components such as Ecosystem Services, etc. - are efforts well spent"

"*…very few people are capable of thinking strategically and even less so when they have to think strategically about the environment*"

"*There is almost zero knowledge or experience of ecosystem approaches, ecosystem services and ecosystem assessment methodologies in Ireland*"

4.4 Insights from literature review

Challenges that have been identified by researches for the implementation of an SEA mainstreaming ecosystem services:

a. The selection of key ecosystem services for the particular case. Literature provides very extensive lists of ecosystem services, but assessments must focus in the most relevant.

b. The definition of the scale. "*Ecosystem services are provided and used at different spatial scales, and those scales may be much broader than the boundaries of a particular planning effort*"

c. The trade-offs need to be identified in an explicit way. "*Research on ecosystem service trade-offs and on how to make them explicit in planning and decision making is limited*"

d. How to choose the right indicators to make it manageable for decision-makers.
(Geneletti, 2011b, p. 147,148)

An insight form the IAIA –International association of impact assessment-, is the list of four tips as the most relevant points to consider when biodiversity is assessed in SEA:

1. Identification of constrains: related to high risk zones. The primary objective is avoid the impacts, and the next alternative is the search for compensation of the lost ecosystem goods and services.

2. The three dimensions of sustainability need to be integrated when analysing the alternatives, meaning that: social, economic and biodiversity aspects are considered. Direct and indirect drivers need to be identified for the impacts analysis.

3. Engagement of the affected and interested parties, to make a joint work taking into account local knowledge and cultural practices.

4. If the baseline is poor in information or the effectiveness of mitigation actions is uncertain, then the precautionary principle must be prioritised. Monitoring must be established as well as findings about adaptive responses.
   (Susie Brownlie (IAIA), 2013)

One of the final aims of choosing to make an integration of ecosystem services into the procedure of SEA is to increase the beneficiaries of the initiative and avoid losers, plus increasing the long term benefits. When this option of integration is selected, the room for analysis of conflicts and mediation of trade-offs is wider. Decisions on political and technical levels are expected to be improved by this approach *(Honrado et al., 2013, p. 21).*

However, according to other studies, it seems that this is not always a recommended approach for the assessment practices, and should be only considered when added value can be assured. Ecosystem services need to be used in the direction of helping to address the environmental problems *(J. Baker, W.R. Sheate, P. Phillips, & R. Eales, 2013, p. 3)*

Stakeholders for SEA with ES in the spatial planning context are specially engaged in these two stages:

-Definition of Scope and objectives of the plan: "*Map areas of production and fruition of key ES*" *(Geneletti, 2011b, p. 145)*

-Alternatives evaluation: "trade-offs and synergies among ES", when and how services would increase/decrease, "and their use by different groups of beneficiaries", winners and losers are identified and for this task the stakeholders are expect to have open participation. (Lydia *Lamorgese & Davide Geneletti, 2013b, p. 121) (Geneletti, 2011b, p. 145)*

In the context of spatial or urban planning, the ecosystem services evaluation can provide data about constrains for development, defining the best sustainable alternative through and SEA process *(Geneletti, 2011b, p. 144).* Information from ecosystem services gives higher quality to the SEA evaluation, the affirmation has been illustrated by the authors of same reference, and presented in the next figure:

Characteristics of a good-quality SEA process	Contribution of ecosystem services (ES) information
Integrated	• ES inherently address the interrelationships between biophysical and socioeconomic aspects. • The analysis of ES-related scale issues facilitates the interaction with relevant plans and policies at different decision-making tiers.
Sustainability-led	• ES approaches explicitly link changes in ecosystems and biodiversity with effects on human well-being. Hence, ES-inclusive SEA processes extend beyond the assessment of biophysical and environmental factors only and promote plans that are more sustainable.
Focused	• ES approaches offer a key to read the most important interactions between human society and the environment, identifying issues that are important for the specific decision-making context.
Accountable	• Analysis of expected future trends in ES under different scenario conditions can be used to document how sustainability issues were taken into account and to justify planning choices.
Participative	• Information on ES by definition requires the identification of beneficiaries and stakeholders, paving the way to more participative SEA processes.
Iterative	• The analysis of ES can be included, in different forms, throughout the whole process (see Table 1), so as to provide information on the expected impacts of a plan's choices during the different 'decision windows' of the planning process.

Figure 8 - Contribution of ecosystem services to quality of SEA
Source: from Table No. 2 (Geneletti, 2011b, p. 146).

Influence in the process from other Regulations

The Annex No.1 of the Directive 2001/42/EC specifies which subjects must be covered in the assessment report, and it is established that "Habitats" and "Birds" directives need special attention. Besides, SEA Directive defines some aspects as essential to be included in the evaluation and to be reported in the SEA documentation; from that list the next aspects: biodiversity and climatic factors, have a closer relation with the ecosystem services, therefore they are key aspects for an SEA mainstreaming ecosystem services.

Local regulation is a factor that determines what information is registered in SEA reports, even though European countries follow the SEA Directive, every country has its own specific rules and requirements regarding the procedures, and how to deal with the interaction with other Directives or local law. In the local scale, there are aspects like -Biodiversity Action Plans- and -Strategies for Biodiversity management and conservation-, which need to be taken into account when the environmental assessment is carried out.

The Appendix No. 2 list some Directives and other regulations or treats that need to be considered when carrying out SEA.

5 Conclusions and Recommendations

Below I present the challenges, opportunities and benefits regarding the participation of stakeholders in the context of SEA, if ecosystem services are mainstreamed in the assessment process. The emphasis is made in the urban and rural context, where policies, plans and programmes are designed for the development of municipalities.

The core issue of the SEA mainstreaming ecosystem services is: Who are the stakeholders, and how much to involve them? While an equilibrium of time, economic resources, transparency and quality of SEA is achieved. Regarding these questions, the methods developed by researches and the perceptions of practitioners is: it is recommended to scan the actors according to the spatial context, and according to the ecosystem services that are provided by the ecosystems in the area.

There is a wide range of proposed stakeholders: researches, strategy and policy makers, practitioners, resource managers, resource users, organisations, associations, environmental agencies, etc. The selection depends on the particular context. Therefore in the urban and spatial planning context, the stakeholders to be included are at least:

- Communities who use and/or depend on the ecosystem services of the region, within the territory of assessment. More specifically, those people who depend on the ecosystem services that are possibly affected by the initiative (PPP)
- Institutions, bodies and sectors responsible of the management of ecosystems and ecosystem services
- Agencies, institutes or enterprises who use and/or depend on the ecosystem services that are possibly affected by the initiative (PPP)

Stakeholder's engagement for this type of SEA need to be done in almost during the whole timeline of the assessment, to complete and/or collaborate with the next activities:

- Identification of Ecosystem services
- Valuation of Ecosystem services
- Decision-making through deliberation about the alternatives, best solution by consensus
- Designing of compensation and mitigation measures for those ecosystem services
- Indicators, which must include performance of the initiative regarding stakeholders

Besides, in a democratic context, the contributions expected from the stakeholders, and from the process of engagement, are the next:

- Knowledge
- Governance functioning
- Fairness and equity
- Holistic solutions (preventive impacts on the three aspects of sustainability)
- Transparency

Opportunities of this type of engagement of stakeholders in SEA:

If stakeholders are identified in the early stage and participate in the process of evaluation, the potential to increase their own benefits from development is enhanced.

SEA can identify other parallel strategies or policies which undermine or degrade ecosystem services and should be able to set alarms regarding these findings, this can be done through stakeholders who have wider views about the topic of assessment.

The alternatives as well as ideas for mitigation can be broader and more innovative. The inclusion of local knowledge and understanding of local needs creates greater satisfaction among the parts. Plus the possibility of creation of awareness regarding nature conservation and reasonable use of ecosystem services.

Empower under-privileged or socially disadvantaged communities.

Benefits of this type of engagement of stakeholders in SEA:

- Dialog is strengthen
- Adaptation of local communities to new PPP is strengthen
- Decisions are taken in a more democratic manner, supported by stakeholders
- Decisions are made in a well-informed context
- Potential conflicts and resistance to PPP are avoided or minimised
- Good governance features are enhanced
- Sustainable development is promoted
- Biodiversity is protected
- Ecosystem services are protected, reasonably used and probably enhanced
- Knowledge and skills transference
- Inclusive and fair planning

Challenges of this type of engagement of stakeholders in SEA:

- The selection of key ecosystem services for the particular case. Literature, and in particular the millennium ecosystem assessment, provides very extensive lists of ecosystem services, but assessments must focus in the most relevant, this is a reason why stakeholders and especially local communities need to take part.

- The definition of the scale. There are at least three different scales identified: the first one is the territory where the planning initiative is taking place, the second is the area from where ecosystem services are provided, and third, where the ecosystem services are used.

- The trade-offs need to be identified in an explicit way. Trade-offs among a range of ecosystem services and its interrelations need to be described in a clear way, and how to link dynamics for the decision-making stage is not perfectly understood yet.

- How to choose the right indicators to make it manageable for decision-makers.

- The des-centralisation of the information, which allows larger participation from non-institutional stakeholders.
- Depending on how the participation process is carried out, the influence of powerful groups can bias the process of decision-making.

- In some countries and cultures, the lack of political willingness can lead to biased involvement of stakeholders, with all the respective negative consequences in each stage of the assessment.

- Timelines of SEA need to be longer, at least in the first stages where the participation is increased. This probably leads to higher economic resources funds for the assessment.

- Cultural and social aspects as: illiteracy, little knowledge about environmental aspects, low economic resources, and low access to the venues for participation; unawareness about the reasonable use and natural resources and about the dependency of societies on the ecosystem services.

- Endless discussions and difficulties to reach consensus in the process.

- Low level of knowledge about ecosystem services and its dynamics, inclusive among well-educated people, and also among some environmental practitioners.

- Marketed ecosystem services are still predominant in the assessments, due to the difficulty of valuation for the other types of ecosystem services.

The challenges show that methodologies for this type of SEA, require to be designed and adjusted to the specific context of the country and region, where every cultural, social, political, economic and environmental aspect is considered and addressed in a particular manner; this action could make that the SEA provides optimum results. In this regard, the situation for the European countries is not a big concern, since the socio-economic and political conditions are stable and more balanced than in other regions.

Therefore, environmental agencies and governments need to add to their priorities the creation of a specific methodology and framework for SEA, which can overcome the potential challenges and promote the opportunities. Even though, a standardised SEA can provide a sensible point of departure.

There were obstacles for the participation, such as: illiteracy; lack of access to communication services; lack of access to the report; restrictions for the local community to express their opinions, which is due to lack of resources like time and money; that enable them to reach means for making this communication; lack of knowledge of environmental issues.
The advertising methods were not ideal to reach the local communities and some local actors. The logistic for meetings, such selection of venues, should have considered with higher priority the distance to homes of local peoples participating in the process.

Methods of this type of engagement of stakeholders in SEA:

Three methodologies are highlighted from three different authors.

1. Addressing ecosystem services explicitly. Explore long term consequences, cumulative effects, to increase beneficiaries and reduce losers. Criteria and steps to be followed are in summary: Ecosystems identification, Ecosystem services identification, identification of stakeholders, drivers of change identification, benefits and valuation.

2. Scenario-analysis approach. This technique allows to map the expected changes of services in aspects like: distribution, value, and uses. Providing a more dynamic analysis instead of a static evaluation.

3. The ecosystem services can be integrated in the Critical decision factors –CDF- designed for the SEA. Besides, the methodology of integration has three steps where stakeholders and ecosystem services interact: 1. identification and mapping; 2. prioritization and ranking; 3. assessment of alternatives.

Reflexions and Perspectivisation

Decisions for long term urban and spatial developments are taken at the strategic level, this is why any initiative evaluated through SEA which is focused in the ecosystem services of the territory in evaluation will assure its maintenance. As a consequence the preservation of its associated biodiversity is also assured.

SEA carried out for development of cities find its complement in the evaluation of those ecosystem services located in the rural areas.

Early actions on the planning agenda, can effectively avoid habitat fragmentation which could happen as a consequence of either future urbanisation expansions or new urbanisation developments.
Experts in the research field and practitioners agree about the fact that the practice of mainstreaming ecosystem services in SEA is still in a very early stage of development; the best methods for implementation are not very well known and the early tests have been based on trial an error, the involvement of stakeholders is playing a crucial role for all cases. There is a leader country in Europe, Portugal, where a methodology is already tested, and cases which are already finished have satisfactory results.

There are few other works of this type in United Kingdom and Netherlands, therefore, it seems that collection of more cases, and new cases studies will lead to the improvement of the techniques. Looking for a simplified SEA, which mainstream ecosystem services to guarantee the conservation of nature, which is also able to enhance the economic and social development. The economic development in many cities in the world is highly dependent on those ecosystem services available in a specific territory.

What is needed now to spread the practice of mainstreaming ecosystem services in SEA is the implementation of this method in more pilot cases, where different contexts and countries need to be involved. This was already proposed by some of the authors and I confirmed that cases are still limited, knowledge in practitioners is still scarce and there is not yet a new global trend to implement SEA mainstreaming ecosystem services.

There is one constraint in the knowledge dissemination, which it is related to native languages different from English in which information is available; if it were possible that SEA reports and local information associated to the same were published also in English, this would help to spread the methods and techniques which are already tested in different countries.

Sustainable development in a global scale will reach higher levels if aspects like transparency are truly promoted in all nations. It was very interesting and impressive to have got the inputs from practitioners in the African countries, since they claimed that stakeholder's participation in this type of SEA would not have an important effect on their assessments, due to the monopolisation of processes, top-bottom planning, politicization of programmes, corruption, patronage, etc.

There is a new Guidance for SEA and integration of ecosystem services, which is going to be published by the United Nations Environmental Programme UNEP, the researcher who participated as one of my interviewees, Davide Geneletti, took part on writing for this document; this action represents how the topic is evolving, and there is concern by organisations about spreading the methods for implementation and making it easier and clearer for practitioners.

Regarding the application of this specific type of SEA in Denmark, I could not get access to any reports, what I could not find out was if there are not SEA cases mainstreaming ecosystem services, or they are in Danish language and this is the reason why I did not have access; however, I had collaboration from an well-known Danish consultancy firm, and not even with them it was possible to obtain these reports.

6 List of Appendixes

Documents are attached in the end of this report:

Appendix No. 1 – Data collection: Interviews. Survey form and results

Appendix No. 2 – Other regulations and directives to take into account

Appendix No. 3 – Projects and initiatives around the world

Appendix No. 4 – Tools for stakeholder's analysis and engagement

Appendix No. 5 – Fragment Guidance OECD – Integrating Ecosystem Services in SEA

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