"A thousand flowers are flowering just now" – Towards integration of the ecosystem services concept into decision making

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ARTICLE INFO

1. Introduction

The concept of ecosystem services (ES) has received increasing attention since the Millennium Ecosystem Assessment (MA, 2005) and TEEB initiative (TEEB, 2010). In recent years there has been a large increase in scientific publications on ES (Martinez-Harms and Balvanera, 2012; Milcu et al., 2013) and conceptual advancements of the concept have laid the theoretical foundation for a wide range of approaches to and methods for ES assessment (e.g. Burkhard et al., 2012; Liquete et al., 2013; Martín-López et al., 2014). At the same time the concept has also been increasingly put into practice and integrated into policies at different levels. For example, the European Union (EU) Biodiversity Strategy 2020 (EC, 2011) urges Member States to improve their knowledge about their country's ES and promote integration of their values into national accounting and reporting systems (Target 2, Action 5). Policies at national levels also underline the need to integrate an ES approach into decision making (e.g. Maczka et al., 2016; SOU, 2013). In both science and policy there exist high expectations of how the concept of ES will change current planning and decision making so that it moves in a more sustainable direction. At the same time criticism of the concept is put forward. The question we pose in our study is: what experiences are gained when actors in actual decision making and planning contexts attempt to put the ES concept into action?

Right now still relatively little is known about how the ES concept is being interpreted, assessed, acted upon and integrated in actual decision making at different governance levels in EU Member States. Although some existing studies focus on investigation of if and how the concept has been integrated in e.g., the spatial planning or environmental assessment discourses (Hansen et al., 2015; Maczka et al., 2016; Mascarenhas et al., 2015; Rinne and Primmer, 2016), many of them concentrate on a single, particular decision-making context at one particular governance level, such as local or regional planning, or river management (Albert et al., 2014; Beery et al., 2016; Böck et al., 2015; Galler et al., 2016; Plant and Ryan, 2013). Even though there exist particular studies that explore ES integration at multiple governance levels or with regard to different sectors (e.g. Hauck et al., 2013; Dick et al., in press), these are still relatively rare. What is particularly missing is, firstly, more investigation of the ES concept's integration from the perspective of the actors close to the "street level" and the details of the day-to-day implementation of the ES concept; and, secondly, exploration of this integration at multiple governance levels.

When a new policy and a new concept like ES is to become a practice some kind of learning, understood as "capacity change" (Illeris, 2007), will take place. In our study we are inspired by theories of learning, and specifically theories related to informal learning (outside the realms of educational settings) and learning at workplaces as outlined by Illeris (2004a,b, 2007, 2009). We focus on the content, incentive and interaction dimensions of learning at workplaces. Learning is neither intrinsically good nor bad, right nor wrong. Learning a new practice, like integrating ES can thus take different directions. Learning as such is a complex process as outlined in the theory section below. The learning challenges, of integrating ES in planning and decision making, may range from emotional factors linked to what motivates actors to work with ES to technical issues like lack of context specific data for ES assessments. The learning perspective thus enables us to pinpoint a broad range of factors, at individual and organisational level, that facilitate or hinder integration of the ES concept in the practical work and the associated challenges. Insights into the use of the ES concept can thus provide an empirical basis for judging how the high expectations and criticism turn out in practice and give

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a foundation upon which to discuss how to proceed with the development of the practice and address challenges.

The aim of our study is twofold: to investigate the actual day-to-day professional experiences gained so far from attempts to put the concept of ES to work in planning and decision making, and, through that, to draw conclusions about where implementation of the ES policy is heading in practice. Different governance levels in Sweden are included and the empirical material is collected through interviews.

The article continues with a brief description of the expectations of the ES concept, together with some mention of the criticism of the concept. After this follows a short account of the Swedish ES policy context. The learning theory and methods applied in our study are included in Section 2. Section 3 describes the results in relation to the Illeris learning theory, and results are then discussed in Section 4.

1.1. High expectations but also criticism

Both scientific literature and existing policies reveal a wide array of positive expectations as regards the use of the ES concept in planning and decision making. Since it draws attention to the benefits people receive from nature (Lamarque et al., 2011) the ES concept is seen as a tool for recognising the dependence of human societies on the natural systems (Beery et al., 2016). It is thus expected to provide a bridge between considerations of ecosystems and human wellbeing (Braat and de Groot, 2012), i.e. to function as a bridge between ecology and economy (Chan et al., 2012a). As such, the use of the ES concept is seen as a tool for internalising the value of ecosystems into essential decisions (Chan et al., 2012a; Daily et al., 2009), designing policies that take account of these values (Geijzendorffer and Roche, 2013; Luck et al., 2012; Primmer et al., 2015), and communicating their value to different stakeholders (Luck et al., 2012). The key expectation is, however, that integrating the ES approach into the work of different actors will improve everyday decision making, by taking account of both the needs and priorities of ES beneficiaries and of the ecosystems that provide services (Beery et al., 2016; Chan et al., 2012b), and thus contribute to sustainable development. Increased knowledge on ES and their links to both the ecosystems that underpin them (Harrison et al., 2014) and human needs (Blicharska et al., 2017) is supposed to change the decisions taken about natural resources (Primmer et al., 2015). Because of that it is particularly important in decisions concerning land use planning (Chan et al., 2012a; de Groot et al., 2010).

Parallel to the high expectations there exist criticism of the concept. In particular, the vagueness of the concept is seen as a challenge in making ES operational in decision making (Nahlik et al., 2012), and the anthropocentric nature of the concept (Mc Cauley, 2006; Batavia and Nelson, 2017), as well as controversies around the issue of economic valuation (Gómez-Baggethun and Ruiz-Pérez, 2011; Silvertown 2015), may lead to resistance towards the concept's implementation (Redford and Adams, 2009; Jax et al., 2013). Although scholars have addressed these different aspects of the ES criticism and provided counter-arguments (e.g. Schröter et al., 2014; Schröter and van Oudenhoven, 2016; Costanza et al., 2017) they may still hinder the concept's implementation in practice (see e.g. Beery et al., 2016).

1.2. ES in the Swedish policy context

In 2013 the Swedish government adopted a policy aiming at integration of the ES concept in Swedish planning and decision making linked to 16 Swedish environmental quality goals (Swedish Government, 2013). This policy highlighted the need to induce change in planning and decision-making practice by integrating ES thinking. Municipalities, County Administrative Boards, National Authorities and other actors are now, following the start of the new policy, in the process of taking on this new concept, i.e. learning how to approach it as part of each organisation's daily tasks and routines. From that point of view a learning perspective is a relevant starting point for the study reported here.

2. Theoretical background and methodology

2.1. Learning

As outlined in the Introduction the integration of the ES concept is expected to change planning and decision making. In this process policies and strategies will be interpreted, assessed and acted upon in different, specific, day-to-day planning and decision-making contexts and various actors will be engaged in the processes of learning. At the general level learning can be described as "any process that in living organisms leads to permanent capacity change and which is not solely due to biological maturation or ageing" (Illeris, 2007, p. 7). The concept of learning as change is fundamental for scholars with a socio-cultural perspective on learning who view learning as a social process (see e.g. Lave and Wenger, 1991; Wootton, 1997; Rogoff, 2003; Lave, 2009; Wenger, 2009). Lave defines learning as "changed participation in the culturally designed settings of everyday life" (2009, p. 201) and Rogoff (2003) sees it as a process of socialisation; as changed participation in cultural practices. Illeris' definition (Illeris, 2007) includes not only change; the focus of interest is the change of capacity, i.e. the ability to do a particular thing, e.g. work with the ES concept. Furthermore, this changed capacity should be permanent, indicating change with a higher degree of consciousness and intentionality.

Learning in the workplace, which Illeris has been studying in particular (2004a), takes place in a dynamic relationship between employees' individual learning processes and the work environment comprised of the socio-cultural communities and the technical-organisational learning environment. Illeris (2004a, p. 432) illustrates this with a model in the form of a triangle, where human learning includes *three key dimensions*, which, in practice, are all part of every learning process (Illeris, 2009). What is actually to be learnt is the *content* dimension, comprising knowledge and skills but also opinions, insight, outlook, attitudes, values and strategies. The second dimension is the *incentive* dimension, consisting of the learner's mental energy, feelings, motivation and volition. "The incentive dimension provides and directs the mental energy that is necessary for the learning process to take place" (Illeris, 2009, p. 10). These two dimensions are initiated by impulses from the third dimension, the *interaction* processes. The interaction dimension of learning contributes to integration in communities and society and thereby reinforces a learner socially. This is the dimension in which it is easiest to influence another person. It occurs in concrete interaction such as participation, communication and co-operation (Illeris, 2004b, p. 83), but also in situations in which an individual is (physically) alone, through her/his interplay with the environment as it is mediated through written sources (Illeris, 2004a, p. 434). In comparison to the aforementioned socio-cultural theories of learning, the strength of Illeris' model is that it explicitly takes the preconditions at the workplace into account and enables their description and analysis. Thus, in our study learning is seen as a constant interaction between the individual's learning process and the learning environment, comprised of the social-cultural environment and the technical-organisational environment.

The learning theory of Illeris as outlined above was the starting point for the present study. However, the theory of 'communities of practice', as expressed by Wenger (1998) is also relevant in

the light of our empirical material discussed in relation to integrating ES in an organisation and in processes for planning and decision making. Integrating ES, i.e. making ES become 'normal' within the work of an organisation and part of its core business and values, requires embracing the concept as a shared practice. One of the main assumptions within social theories of learning is that a shared practice concerns not only a certain pattern of activities, but also the meaning attached to these activities and identity formation. The existence of a shared practice implies that actors interact in many ways and that they have a common endeavour and share a common repertoire of language, styles, ways of doing things, stories, and routines through which they express their identities as members of the group (Barton and Tusting, 2005; Wenger, 1998). Even though a 'community of practice' is defined by mutual engagement among the actors involved, it does not necessarily lead to homogeneity; it can be conflict ridden and competitive as well as co-operative (Wenger, 1998). The negotiation of a joint enterprise gives rise to mutual accountability. These relations of accountability include "what matters and what does not, what is important and why it is important, what to do and not to do, what to pay attention to and what to ignore, what to talk about and what to leave unsaid" (Wenger, 1998, p. 81). Related to integration is also research on change in organisations and organisational learning. In the context of this paper we will not include this large theory field except in our discussion and results which explicitly cover the challenges related to how organisations manage the policy goals of ES integration (e.g. Benn et al., 2013, Molnar and Mulvihill, 2003).

2.2. Methodology

We gathered experiences with ES work through semi-structured interviews (Kvale, 1996) with 21 employees in six types of public or private organisations and sectors. All in all, 20–25 h of interviews were recorded and transcribed. In addition to interviews 24 ES assessments were collected, reviewed and used to get initial insights into ES work and especially ES assessments (definitions of ES used, qualitative or quantitative approaches, geographical scale of analysis etc.) and to become familiar with the broad range of this work in Sweden. The reports were found through online search or obtained from the interviewees, using snowballing, and provided a collection of most of the ES work in Sweden at the time of investigation (December 2015).

The interviewees were selected using purposive sampling (Bryman, 2012), i.e. chosen strategically to be relevant to our research questions. Thus, because we aimed at providing insights into the practical use of the ES concept, we selected individuals who had already worked, at least to some extent, with the concept. As such the interviewees can be seen as forerunners as regards ES work. The selected interviewees included national level authorities (2 interviewees), county administrative boards (3), municipalities (8), private companies, both industrial and consultancy companies (7), and a biosphere reserve (1). Because of our sampling strategy, most of the interviewees had a professional background in biology, ecology or conservation, as these are the sectors that took up the ES concept in the first place. The interviews were conducted between October and December 2015 and lasted between 45 min and 1.5 h. The interview guide containing 28 questions was constructed to cover the three key dimensions of learning according to the Illeris theory described above (See Appendix A). In relation to the content dimension, questions were asked e.g. about how the work with ES differs from the interviewees' ordinary work, what contribution they perceive there is from the ES concept to their work, and what data and guidelines exist. In relation to the incentive dimension, we asked about interviewees' reasons for working with ES, the priority given to it, factors that influence their own work, as well as the work of the whole organisation. For the interaction dimension, questions were asked concerning e.g. support existing (or not) in the organisation, the actors involved in the ES work and current policies influencing the ES work. Interviews were conducted by both researchers (each conducting 10 and 11 interviews respectively). Regular and in-depth discussions were the basis for construction of the interview guide, for ensuring that both interviewers had a common understanding of the meaning behind each interview question and for exchanging experiences and challenges during the process of interviewing.

The interviewees were, prior to the interviews, informed about the project and about their rights as interviewees and gave informed consent to be interviewed (Bryman, 2012). To respect the possible sensitivity of the opinions expressed by the interviewees they were

Table 1
The ways in which ES contributes to the work of the study's interviewees. Each statement below is derived from actual statements in the interviews but synthesised and paraphrased for the sake of conciseness and clarity.

ES concept as a:	How does it work
Communication tool	ES is an important complement in communication with other environmental officers and politicians
	ES bridges borders between environmental and other sectors and professions
	ES provides a system view and thus shows mutual interests in a landscape and gives incentives to co-operate.
Pedagogical tool	ES makes the links between nature and humans and our dependence on nature clear
	ES enables values that were previously invisible to be seen
	ES explicitly shows how negative environmental impacts directly and indirectly influence humans
	ES shows in a new way the values in nature. The whole spectrum of values is displayed compared to e.g. showing how rare a species is
	The values attached to and priorities made by planners and decision makers in relation to nature are often implicit or invisible but ES makes the values and priorities visible
Argumentative tool	ES assessments give better grounded arguments for taking care of nature
Safeguarding tool	ES helps to show whether a loss in nature can be compensated or not
	ES makes clear where values have been wiped out and where efforts are needed to improve ES
	ES assessments show what can be lost due to developments
Strategic/planning tool	ES promotes more efficient land use and multi-functionality and helps see that it is smart to make use of all the benefits – including the green ones – in a piece of land
	ES data about green areas can compete and be equal to e.g. plans for exploitation, so there is less room for airy judgements
	ES helps private companies identify critical resources for the company
Novel approach	ES is a more modern concept – nature conservation feels outdated and old-fashioned
	ES redefines environmental issues as something positive (that nature actually produces something)
	ES positions nature conservation as an integral part of society – nature conservation does not need to be seen as a hindrance but also an asset to society

also informed that there would be no specific mention of name of organisations, positions or personal names in the reporting.

We used a qualitative content analysis approach (Bryman, 2012), with open coding of the interview material into particular categories. Coding entailed reviewing transcripts and categorising particular pieces of the interviews that were significant in relation to the three dimensions of learning under specific categories. In our coding we were also open for other categories that emerged during the course of analysis. For example, the pre-defined categories for the content dimension were about existing data, knowledge and work routines, the process of development of the ES work, ways of reporting ES work, definitions and types of ES used in the work, etc. while one of the emergent categories for this dimension concerned the role of consultants in driving the development of the ES assessments. Also, the different ways in which ES contributed to the interviewees' work (see Table 1 in the Results) emerged during the coding and were not pre-selected.

To assure validity and reliability of coding we adopted a step-wise approach. First, the coding scheme, including each pre-defined code, was created (the scheme can be obtained by contacting the lead author). Second, each researcher coded their own interviews. Third, during the coding regular meetings were arranged to discuss and cross-check the coding and, particularly, to continually discuss the emergent categories. In addition, the researchers coded samples of each other's interview material to check for coding reliability.

After initial categorisation we used memos (Glaser and Strauss, 2008) to summarise relevant information across all the particular coded issues. Memos were created for each coded category by both researchers, in the process of discussion, deriving from the categories coded individually. In each memo we summarised refined information that was collected for each coded category, using the constant comparison approach (Glaser and Strauss, 2008) across all interviews. Memo writing allowed us to interpret the data by asking questions about it and finding relationships between findings from particular interviews (Birks et al., 2008). Thus it enabled extraction of the key information regarding each category across the whole sample of interviews.

In the final step of the analysis we used memos to create a narrative that is presented in the "Results" section below, as well as to derive key development needs that need to be addressed to facilitate integration of the ES concept in decision making.

3. Results

We present the experiences from the interviewees and their efforts to apply the ES concept in relation to the three dimensions of learning (Sections 3.1–3.3) but acknowledge that there exist overlaps between these three. The results were derived from different kinds of organisations in the private and public sphere. However, our narrative presents all experiences together and only specifies the type of organisation if the experience or context is necessary in order to understand the particular result. As part of the discussion in Section 4 we summarise the factors that strengthened the ES work and the challenges and development needs (Table 2).

3.1. What has been learnt?

This section focuses on the experiences that relate to the content dimension of learning. We describe the Swedish experiences focusing on ES assessments, the key focus of the ES work (3.1.1) and experiences of how the concept works (3.1.2).

3.1.1. ES assessments

A number of ES assessments have been and are being made in Sweden, mainly in relation to municipal spatial planning, but also as part of the strategic environmental work in national and regional authorities and in private companies. Our interviewees were either those ordering (purchasing) and using ES assessments or those conducting them (mostly environmental consultants).

According to them there were many challenges arising when trying to make ES an analytical tool and not just a pedagogic one. In particular, there was a need to understand how to move from general knowledge about ES to the actual assessments and the practical use of them. As the interviewees described: "You grasp

Table 2
Summary of experiences from interviewees' work with the ES concept – what supports work and challenges and development needs in relation to the three learning dimensions.

Learning dimension	What strengthens/enables ES work	Challenges/Development needs
What is to be learned (content)	Existing material to learn from Dialogue with forerunners Driving role of consultants in developing assessment methods	To move from general ES knowledge to actual assessments To learn how to use results of assessments, particularly numbers To learn how to deal with conflicts between different ES To be able to account for values not directly linked to human use To be able to compare ES assessments when different methods are used To clarify terms and classifications (ES, biodiversity, etc.) To have more examples of ES assessments, particularly valuation studies, including experiences of the use of different methods To develop standards, routines and templates for ES work To provide guidelines in Swedish for how to work with ES
Motivation (incentive)	Motivated individuals/bottom-up initiative Environmental background (previous work) Interest in nature Specific task given "from above" Concrete assignments Dialogue with forerunners Pilot and test trials Institutional support Relevance for the organisation Using examples	To make the ES concept relevant for the practical work To make quantification and valuation of ES meaningful To educate/inform people at all levels in an organisation (whole chain) To provide a mandate to work with ES and take others' time to work with ES To specify what the work with ES means in the organisation To integrate ES thinking into existing processes in the organisation To link ES to the organisation's goals To adapt rationale for the ES work to the context of a particular sector To co-ordinate ES work at higher governance levels
Environment (interaction)	Authorisation from the executives Focus on what one has control over in the organisation Support from international and national policies	To strengthen links between existing national level regulations and ES work at lower levels To improve dialogue between consultants and authorities that order the ES assessments To improve procurement rules to enable better dialogue To develop guidelines for those ordering ES assessments To develop quality control for consultancies' work

the theory and the concept – ok, this is very good – but when it really comes to practice, to start calculating that, it is very difficult. This is where we are not getting anywhere".

Environmental consultants (occasionally in co-operation with researchers) appeared to be the main drivers in advancing different methods for ES assessment developed to fit various practical contexts. As one of the interviewees put it: "A thousand flowers are flowering just now". Each consultancy was currently developing their own approaches to ES assessments, ranging from qualitative descriptions and expert judgements to economic and quantitative assessments. The work with ES ranged from comprehensive assessments covering whole municipalities and all kinds of ES, to relatively narrow ones covering only a few ES or limited geographical areas. What decided the scope of the assessment was a trade-off between good scientific quality and adjustment to the customer's needs and resources. This took place through the interplay between the customer and the consultant and is described more in Section 3.3.

The interviewees expressed concerns about the way the assessments were done and how they could be used. It was especially highlighted that quantifying and producing numbers should be treated with caution. Numbers, some said, tend to stick and "can take on a life of their own and all of a sudden a number is circulating as an absolute truth; nobody is reading the text". Nevertheless, it was underlined that numbers could help to compare different options, when "the same was done for different projects, so there can be some priority scale", because "people like numbers, even if the number is between 7 and 512, so it is anyway a value that one can relate to another value".

Several interviewees pointed out that often the assessments did not make the link to human use explicit. It was often made on a very general level e.g. if there was a forest it meant that ES of water regulation and recreation were delivered. That meant that the actual service was not always studied and analysed. In particular, assessment of cultural ES was perceived as particularly difficult. Questions were also raised in relation to how to deal with conflicts between different ES and how to account for values not directly linked to human use that might easily be overlooked. It was also stressed by both consultants and users of ES assessments that the perspective of well-functioning ecosystems and ecological functions that deliver ES as well as the concepts like landscape connectivity and resilience needed to be included in the ES work, indicating that the ES concept was seen as a complement to other existing concepts and approaches. In some cases there was also some confusion as to what ES actually were and how to define and classify them and definitions and classifications were often adjusted to the particular assessment's context.

There were also concerns about how to relate ES assessments to each other in a situation where various methods and approaches were used. It was underlined that very few of the ES assessments made in Sweden, were of economic or quantitative character. Thus the need for more examples of Swedish ES assessments, particularly economic valuations, was highlighted. Specifically cost and time effective standards, templates and routines for analysing ES that work in the Swedish context were requested by many of the interviewees. Development of methods to adapt a set of data to another place, and guidelines to work with ES adapted to specific sectors and prepared by people that are familiar with particular sectors were also requested.

3.1.2. How does the concept work?

The overwhelming impression from the interviews was that the ES service concept met many of the positive expectations. Based on what the interviewees said, we have identified several ways in which the work with this concept appeared to improve decision making, collected in Table 1. The statements in the table are derived from actual interview statements but synthesised and paraphrased for the sake of conciseness and clarity. The six categories in Table 1 emerged from the analysis of the interview material. The ES concept was experienced as a communication tool that helps to bridge borders between different sectors, because "many can feel involved; it is so inclusive". It also worked as a pedagogical tool enabling explanation of the complexities involved in how nature provides benefits to humans. ES assessments also provided better arguments and helped visualise the potential losses of natural resources following development. In addition, ES assessments helped planning by identifying critical resources and supporting efficient and multifunctional land use. Finally, the ES concept was seen as a novel approach that turned conservation into something that "generates value for society" and shifts environmental issues from being "doomsday prophesies" to societal "assets".

Although the meaning of the ES concept seemed to work well in general, the interviewees also shared some difficulties with using the concept. Some people avoided the concept, as they perceived it as too theoretical for the rest of the organisation, "too far from the shovel" and far from the actual practical work. The concept was also sometimes seen as too "dry" and complicated and thus "not easy to sell" to the public. It was frequently mentioned that there was no huge difference between work with ES and the work done previously. To some of the interviewees, working with ES required just "reformulating" the existing work and identifying the aspects of the work that could be "translated" into the ES concept. Thus, it was seen as important to treat the ES concept as "complementary" to other concepts, such as "sustainable development" or "resilience", and other existing approaches and tools, e.g. for biodiversity conservation. The anthropocentric nature of the ES concept and the risks linked to it were also highlighted, particularly with regard to economic valuation in relation to biodiversity. A question was posed on "how to value e.g. a 5% loss of biodiversity", especially when one could not see direct explicit links between biodiversity and human wellbeing. It was thus stressed that one needs to apply a "precautionary principle" and keep a general ethical stance; not just focus on the services explicitly providing value for humans, but also account for values that are not directly visible (e.g. long-term resilience, rare species that seemingly do not have direct value to humans, etc.): "since we do not know how many species we need to save we need to have a good moral standing, saying that we shall not make any species extinct".

3.2. What motivated actors to work with ES?

From the interviews it is clear that there existed a variety of factors that comprise incentives, i.e. the positive drive to start, develop and pursue the work with ES. We focus here in Section 3.2 on the experiences related to factors that motivated/demotivated individuals (including feelings and mental energy in relation to the ES work) (Section 3.2.1) and whole organisations (3.2.2) to work with the ES concept.

3.2.1. Motivation, feelings and mental energy

In general, the ES work started to develop around 3–7 years before our investigation. The work was either something initiated by particular and interested individuals or a specific task given from "above" in the organisation. In most cases it was the actors that have already worked with environmental matters who started using the ES concept and initiate ES projects, driven by their own interest in nature and willingness to protect it. Several interviewees underlined that their own "bottom-up" initiative was important in initiating the ES work in their organisation, driven by their "curiosity and willingness to convey that [importance of nature]". Being persistent in their belief in the usefulness of the ES concept was evident in several cases: "And I started to repeat and nag, nag,

nag!" It was also underlined that ES assignments given to individuals should be well-formulated and concrete, otherwise "it can be frustrating (…) not to know exactly what to do".

According to most of the interviewees it was helpful that there was enough material to learn from (reports, scientific publications, recommendations and guidelines), both in English and Swedish, so it was possible to start to orientate oneself in what the concept was about: "You read their documents and get inspiration". Others, however, felt that the English language guidelines were "tiresome" and that more Swedish ones were needed. It was also clear that having dialogue with the forerunners, those already working with the ES concept, was an important ingredient in providing motivation to get started.

In addition, the positive feeling and mental energy linked to contributing to sustainable development, functioning ecosystems and resilience was important for developing ES work: "It is interesting and important" and for some it was even "joyful", "fantastic" and "exciting" to use ES in planning. Being part of the creation of new methods and being part of development was e.g. expressed as "great fun" and "pretty cool".

Even if some interviewees believed that ES work was not much different from what they did before, they were strategic and used the concept because it was "modern" and it was seen as providing a complementary tool to analyse and communicate environmental problems (see Section 3.1.2). One interviewee also pointed out that working with the concept of "nature conservation" was "old-fashioned" and not relevant anymore in the societal change that was taking place.

However, there also existed some feelings of insecurity about if and how to use the ES concept. For example, it was pointed out by one interviewee that the government asked for faster planning processes on the one hand and on the other required ES considerations, and these two requests were "not coming together". The same interviewee also mentioned that the planning legislation regulated e.g. house colours but not "issues that really matter for sustainable development. That can be frustrating". In addition, work with ES in Sweden was seen as diffused and difficult to grasp as a whole: "So much is happening… it is difficult to get a coherent picture".

Also, some interviewees worried that the ES concept might be misused by actors who had less knowledge about ES, or perceived it just as a new "buzz word", "unnecessary" or just a "new way of packaging what we already do". There were also questions about whether quantification was meaningful, as it could sometimes be too "boxed-in" and also did not reflect the real value of nature, as e.g.: "how can you value the opportunity to catch fish in a river a 100 years from now". That was why it was underlined that one should be careful with numbers. There were also concerns with what was being "overlooked" while using the concept. The "needs" of endangered species and biodiversity were perceived as not being "expressed" when using ES.

In relation to ES assessments there were quite many experiences reported of relevance to this section and we can only report a selection. As outlined earlier a diversity of approaches and methods were in use and different actors struggled with attempts to categorise, assess and implement ES assessment. Many interviewees highlighted the importance of relevant legislation, policies and regulations that could steer and support their ES work. Several also pointed to the difficulty of knowing when using ES was most relevant: "It is a bit intangible. In what decisions and processes is it relevant?" And when time and money constraints were present it was "…not easy to achieve both usefulness and at the same time do something academic." Overall in Sweden the economic valuations were few and were perceived as "a bit harder" than qualitative assessments and map presentations. One interviewee also pointed to the fact that assessments were not neutral but in fact included judgements: "…it is a challenge, you develop methods but there are still judgements on what to include and not".

3.2.2. Creating motivation in the organisation

One important task identified by the interviewees was that they needed to motivate the rest of the organisation to integrate the ES concept into the daily work. To enable that, "somebody must start [the work with ES]", even if the existing methods and tools were still not well developed. Small-scale pilot and test trials were thus seen as an important starting point but they should not be too ambitious, because "if our ambitions are too high (…), we will never start with anything". Although in many cases it worked well to develop pilot studies, one interviewee described a negative experience where ES was introduced as a new concept and the municipal politicians discarded the ES work as being "rubbish that eats up time". Another interviewee had a similar experience when introducing the concept in a report back in 2005, where she was ordered by the municipal politicians to remove it since it was "strange".

According to the interviewees, to be able to motivate the integration of ES thinking into the organisation's work, one needed to focus on what organisations could decide over and what was of relevance to them. Thus it was important to integrate an ES approach into existing strategies and processes in the organisation, meaning "translating" the concept into aspects that were relevant for the organisation, e.g. combining environmental goals (linked to ES work) with other goals in the organisation, or incorporating the ES concept into the existing planning process that uses principles of balancing environmental losses and gains. It could mean, particularly in relation to private companies, answering the question "what's in it for me?" as regards ES use. As one interviewee expressed it, the company did not want to hear "about some fluffy UN convention" but instead "what does it mean for my daily work".

The environmental consultants were seen as particularly active in driving the development of ES work. For them there was a new and emerging market that opened up for new products linked to ES to be sold and marketed. The personal engagement and willingness to promote good environmental management was also a key factor driving the work.

The need to align ES work with existing regulations and an organisation's goals was mentioned by several interviewees. It was suggested that one should aim at an initial overview of the organisation and its activities, to see "what it is we are doing and what we have control over, and where ES needs to be taken into consideration". One needed to "include the whole chain" in the organisation as regards the ES work. Moreover, there is a need for smooth and cost-effective routines to work with ES, aligned with existing work which, according to the interviewees, did not exist yet.

To communicate the importance of ES to the whole organisation, there was a need for a good pedagogical approach. As suggested by the interviewees, to make such a "dry" concept as ES relevant for decision makers, one needed to be very specific by giving examples of e.g. how big a share of what we eat is dependent on the pollination from bees. Also, the idea of ES should be explained in a sector-adapted language and perspective to make it relevant for the whole organisation and not just for the environmental side.

There were some concerns that the ES work done in Sweden was very scattered, conducted with different methods and without national level co-ordination. This led to uncertainty, as the actors actually working with ES did not know how their input can be

used, e.g. to report to the EU, as required by the EU Biodiversity Strategy.

3.3. The work environment

While one's own internal and personal motivation was important, learning processes were also always influenced by the work environment i.e. the technical-organisational and socio-cultural environment. This section focuses on the experiences that relate to this dimension of learning.

In all our cases the ES work started with one person – due to either personal interest or because of a specific assignment from the head of their office. Here existing policies and regulations were important both for initiating and developing the ES work. However, it was highlighted by some of the interviewees that in some cases the legislation was "very regulated and rigid" and still not in line with the broad ES thinking. For example, one of the interviewees exemplified that "what you should consider in the planning process is steered [by legislation], and there I think, ES is not linked in". On the other hand, some interviewees believed that the work with ES was well supported by international and national policies, such as: "because the EU works with it; because the government works with it; and also because the Environmental Protection Agency has a governmental order to work with it; it gives us the support to work with it. It receives a totally different status in the work of the municipality".

However, that the work was supported from the "top", i.e. the executives in an organisation, was crucial for using time and resources to actually implement the ES concept. Otherwise one needed to "squeeze it [ES work] into the time that was left over [from the regular work]". Lack of mandate, particularly in public authorities, was often linked to "loose work descriptions" that hindered effective and focused work on ES. An institutional support was particularly necessary if the individuals were to use their own and claim others' time to work with ES. Some of the interviewees mentioned that it was not easy to obtain a mandate for it. As it was described: "we have all these directives (…) but it is not enough when I go to the heads of other units and ask them for time from their members of staff, because there are other things that have a higher priority". Many interviewees, particularly from authorities, complained that they lacked time and money to become more engaged in ES work. Otherwise one "is only keeping oneself informed and sending information on; one is updated but it does not change anything". To gain better support and the mandate to work with ES the interviewees applied different strategies, such as organising different events (seminars, trips) and involving decision makers in the dialogue about the importance of nature. The idea was to show that focusing on ES was a "smart" thing to do and that "we all gain from it".

In other cases finding new solutions and ways of working was supported and ES was seen as the appropriate issue to work with. With regard to that, the culture of embracing change differed between the organisations in our study. Typically, the private businesses in our sample seemed to promote change in the whole organisation. In the local, regional and national authorities the culture was more that the experts from the environmental sector tried to promote the work of ES in the other units of the organisation, it being "a constant struggle".

In order to organise and integrate ES into the whole organisation a number of steps were taken or planned to be taken. Some organisations have put together multidisciplinary and cross-sectoral groups to work with ES and others were planning to arrange something similar. The aim of these groups was to discover where in the organisation ES work fitted in and to "spread the word' about ES. In several cases the initial work was planned

together with researchers through workshops or seminars which included more people from the organisation.

The internal conditions for consultants learning and developing methods differed. Some consultants explained that there was no extra time given from the firm for competence development, besides the time put into the actual ES assessment projects, while others did get this extra time. Some consultants also stressed that some of the ES assessments were very time consuming due to lack of standardised methods. It was, however, suggested that the ES work would be less time consuming and less costly in the future, when standards have been developed.

An important work environment factor was the communication and dialogue between consultants and the authorities/companies that order the ES assessments, which was crucial for the overall development of ES methods and approaches. However, many consultants mentioned that the authorities often had limited knowledge of the possibilities linked to the ES approach and existing assessment methods. They were also not aware how much time it could take to address such complex questions as ES. Because of that the authorities often expected too much from the consultants' work with ES. "Maybe we had the wrong expectations" as one municipality interviewee expressed it after having received an ES assessment ordered by them. As expressed by one of the consultants: "they want the moon and the stars and they want them by Thursday". On the other hand some consultants were not yet familiar enough with how and when their ES assessment best fitted into the existing planning processes. Therefore, the consultants asked for guidelines for those ordering and purchasing ES assessments, so that they could learn what to consider when ordering ES assessments, how ES assessments could contribute to planning and decision making and what type of information was needed for taking particular decisions. Also, larger databases with detailed information on how different ES assessments were made together with databases bringing up green solutions were asked for as an aid to facilitate such understanding. On the other hand, some municipality representatives mentioned lack of trust towards the work of consultants and underlined the need to learn more to understand what the consultants do. They believed that what the consultants did was "shaky" (i.e. not having a solid knowledge basis) and that they needed to develop some kind of "quality control", as they still did not have much knowledge and experience in conducting ES assessments.

4. Discussion

4.1. ES concept meets many expectations

Our study sheds light on experiences gained from attempting to put the concept of ES to work in the everyday practice in planning and decision making at different governance levels and in public and private contexts. Our results show that the EU and Swedish policies on ES have inspired a number of environmental actors to initiate work with ES in the Swedish planning and decision-making context. Implementation of the ES concept seems thus to have gained momentum in going from policy formulations to some kind of practice. This development is, however, still in its initial phase. Various actors try out different definitions, approaches and methods. This happens simultaneously at different governance levels and in different types of organisations and is perceived as "a thousand flowers flowering" without national level co-ordination. As such, learning defined as "a permanent capacity change" and aiming for integration of ES in everyday planning and decision making is just in its infancy.

The study also shows that the practice of ES, so far, seems to meet many of the expectations outlined in Section 1.1 (see summary in Table 1), in line with other research showing that

ecosystem services "may have value beyond being an instrumental tool for accounting and mapping" (Rinne and Primmer, 2016). We especially want to point to the results that the ES concept seems to be perceived by our interviewees as meaningful for actors beyond the environmental and nature conservation sector. How to e.g. connect economic development with environmental management is essential for taking account of nature's value in important decisions, thus leading to more sustainable development. Our results suggest that ES could potentially contribute to overcoming compartmentalised and narrow planning and decision-making worldviews and practices. What is needed is to create "communities of practice" as outlined in the theory section i.e. creating a sense of a shared goal in relation to caring for ES and sustainable development (Barton and Tusting, 2005). If the ES concept can help in bridging perspectives and function as a "boundary object" (Schleyer et al., 2017) this may be its major contribution to sustainable development. Boundary objects are "artifacts, discourses and processes that allow connection between different perspectives among communities to achieve a common goal" (introduced by Star and Griesemer in 1989, in Impedovo and Manuti, 2017). Previous research has, for example, already shown that ES indicators could act as potential boundary objects that can support shared understanding between different actors in spatial planning (Saarela and Rinne, 2016). However, it must be kept in mind that most of our interviewees were from the forerunner organisations and represented sectors that might be more interested in the ES concept. Therefore, there is a need to investigate the uptake of the concept by other sectors and actor groups (e.g. city planners, lawyers, engineers) to confirm that it indeed serves as a boundary object. Initial studies on this have gained mixed results. Saarikoski et al. (in press) analysed the use of ES knowledge in 22 case studies and revealed that in many cases there was lack of horizontal integration between sectors. However, in some of their cases ES did act as a boundary concept facilitating communication between different sectors, including urban planning and management, agriculture and tourism.

Some of our interviewees confirm the existing criticism linked to the anthropocentric nature of the ES concept, i.e. that it is biased and does not cover all the values coming from ecosystems, e.g. these aspects of biodiversity that do not directly give services to people. Making the concept operational is also a difficult issue. This is especially true in relation to when to use the ES approach, when ES assessments are helpful, how to make an ES assessment that fits in into the different planning contexts and economic ES assessments in particular lack context-specific data. One clear criticism is also of the concept itself and its theoretical, far-from-the-ground, character. This creates the need to adopt other concepts while keeping the idea of ES in mind. Our interviewees also brought to attention the multitude of concepts already existing in nature conservation and in relation to sustainable development. One criticism was that this new ES concept needs to be placed and defined in relation to them.

4.2. Learning to integrate ES is a complex process and a multifaceted task

As outlined in the theoretical background of the study, learning a new practice at a workplace operates through the ongoing and simultaneous interplay between three learning dimensions. Our interviews have shown how learning takes place through processes both at the individual level and in the interaction between the individual and structural level (e.g. the organisation, national and international policies). Learning as such is thus a complex process (Illeris, 2009, p. 1). In addition, the interviews have revealed that learning to operationalize and integrate the ES concept is a multifaceted task – ranging from finding information to start with, get-

ting started with actual assessments, creating new methods, to finding out when ES perspectives are relevant, organising the work and motivating the rest of the organisation to work with ES. Since the multifaceted process of integrating ES is in its initial stage the amount of challenges and development needs is large. Table 2 summarises 1) the key factors that strengthen the learning of how to work with the ES concept, and 2) the main challenges and development needs necessary to improve learning, as revealed by the interviewes.

Table 2 suggests that for ES work to survive an initial 'honeymoon' phase where strong individuals, novelty, curiosity and high expectations are driving forces, and be integrated in the long term, a number of large challenges exist. According to the interviewees, in most of the organisations in our study the integration has not yet happened i.e. the ES work is not yet "embedded in the organisation's systems, structure and culture" (Cummings and Worley, 2009 in Popova-Nowak and Cseh, 2015). In relation to that, our interviewees point to the importance of making the concept of ES meaningful for the whole organisation, its tasks and language, from the top executives to the ones on the ground. This may only happen through dialogue and communication as outlined by Nijhof and Jeurissenn (2006) in Benn et al., (2013): "While it is easy to consider sense-making to be primarily an introspective process, in fact, we make sense of things in organisations while in conversation with others, while reading communications from others, while exchanging ideas with others". Context in relation to learning also means the learning conditions that exist and/or that need to be created for enabling and putting ES into practice in a particular organisational setting. In order to further the practical work with ES each organisation – particularly its leaders – must think in terms of promoting learning conditions, assessing the needs and providing as good as possible conditions (Hilding-Rydevik and Blicharska, 2015) on the individual, group and organisational level. Previous studies have also identified the need for institutional adaptations necessary to operationalise ES (Rinne and Primmer (2016) and highlighting the significant delays in adopting new knowledge in practice (Healey, 2006). Our study identifies development needs linked to specific learning dimensions and that may help "speeding up" the adoption process (Table 2). It also highlights the particular need for political will (support from executives) which has also been previously identified as an important factor in changing organisational practices in the ES concept implementation (Dick et al., in press).

4.3. The learning perspective

Our study provides initial insights into the early practical experiences gained when attempting to integrate the ES concept into every day planning and decision making, from the perspective of planners and decision makers at different governance levels. It thus fills a research gap in relating the theoretical and political expectations and criticism, to actual experiences. The learning perspective applied has proven to be useful in pinpointing the conditions needed for learning to work with the ES concept and to integrate it in organisations. The importance of the three learning dimensions in introducing a change in organisations in relation to ES work is relevant for other countries, beyond Sweden, as they are valid for any learning process (Illeris, 2009). Our study is, however, done in one single national context. In Sweden, for example, environmental consultants are seen as the key actors driving ES work, while in other contexts other factors may play a more important role. The Swedish work is also supported by a governmental policy and the Swedish Environmental Protection Agency providing information and guidelines. This is not necessarily the case in other countries. The particular context of each country will lead to specific, context-dependent factors that either enable ES integration or

are improvement needs. More empirical studies are thus needed on practical experiences of the concept and how integration in relation to the ES concept happens in practice in different national and sectoral contexts. This is relevant especially in relation to the boundary object function discussed earlier. Our conclusions are also based on the data derived from a choice of forerunners i.e. those being engaged and in favour of the concept which, obviously, may have influenced the results, e.g. the amount of positive experiences. A complement to our study would also be to more closely examine if and how managers at different levels explicitly consider what kind of learning conditions they provide and create for their ES work. In our study we focussed on the lower level officials and their views, which of course offers only one side of the story.

Other questions that need to be addressed in future research are the vital questions of when and how the results of ES assessments (and particularly economic valuations) can be used to improve decision making, which approach works best in which situation and how to enable comparability of studies done with different methods and tools. Advancing this knowledge will provide important inputs to both the content and the incentive dimension of learning ES work.

5. Conclusions

Our study clearly shows that turning what was initially aimed to serve as a pedagogic concept into e.g. maps, numbers and presentations in formal formats in ES assessments and integrating it into organisations at large is a challenge, although the practice of ES seems to already meet many of the positive expectations.

The confusion existing in the implementation of the ES concept and the development needs presented above call for general conceptual developments concerning the concept of ES. It also requires going a step further, beyond the conceptual advancements, and linking the theory of the ES concept to theories of practical application like e.g. learning as applied in our study. An important general issue is raising awareness of the role of "street level" officials in both private and public organisations and improving the conditions for change and learning to take place, individually and in the whole organisation, which has an impact on the success of the ES implementation. While this is not specific to ES, but applies to all new concepts, methods and policies, our study gives a "smorgasbord" of factors that affect ES work specifically and have an impact on these conditions and can thus serve as inspiration for further studies.

The present situation, where the ES concept is in fact put into practice in planning and decision making but understood differently by different actors and no standard approach to working with it exists, may undermine the possibilities of meaningful implementation of the EU Strategy across all Member States. On the other hand, the active engagement of the various actors who drive the ES work can be seen as something positive that may lead to development of useful practical approaches for integrating the ES concept into decision making in relation to different needs and contexts.

Acknowledgements

Appendix A. Interview guide (questions translated from Swedish)

What is to be learnt: e.g. facts, methods, concepts, attitudes towards the work

The tension field of learning
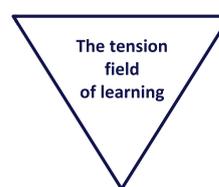
Motivation: e.g. feelings, volition, reasons behind the work

Work environment: e.g. organization, support, technical environment, co-operation…

Learning: a permanent capacity change not due to maturing or ageing (Illeris, 2009).

Introduction

Introduce the project and its aim. We would like to learn about their experiences and how the work with ES is functioning from their perspective. ES is a new concept and there are many ways to work with it. There are no established rules that everyone could use, so we would like to learn from them.

The interviewee should also be assured of anonymity/confidentiality and asked if we can record him/her.

Questions

[To be asked in order that fits the interview flow; additional follow-up questions may be asked].

"Warm-up"

1. What is your position in the organisation?
2. What issues do you most work with, in the organization?

What

3. Can you tell us how you generally work with ES within your organisation? [*both the interviewee personally and other people in the organisation*]
4. How does the work with ES differ from how you have used to work? [*Also Environment*]
5. How did you develop your work with ES?
6. How did you know how to start the work?
7. What documents are there to help you with the work?
8. What more is needed?
9. How was/is the work reported in writing? Can you share any material with us?
10. Which ES have you chosen and why? [*relevant if an ES assessment was done*]
11. How did you work with the ES assessment in detail? [*Relevant for ES assessment work; reports should be read before the interview to be able to ask for details of the project*]
12. Who took part in the ES assessment and what did the process look like? [*Relevant for ES assessment work; also Environment*]

Motivation

13. What do you think was/is the most important contribution of the work with ES?
14. Did you experience anything that was difficult?
15. What in the ES work are you most satisfied with? [*Only if the interviewee seems satisfied/happy with ES work/concept*]

16. What prerequisites/conditions did you have to work with the ES project? E.g. Time, resources [*Relevant for specific projects; e.g. ES assessments*]

17. Were the conditions/resources sufficient? [*Relevant for specific projects*]

18. Why did you chose to work with ES concept in this particular project? [*Relevant for specific projects*]

19. Did you get a direct order/commission to work with ES/the project?

Environment

20. When did you start to talk about the ES concept in your organisation? Why? [*Also What*]

21. Who took the initiative to start working with ES? Who was/ is involved in the work? How was that decided? How was that work anchored in the organisation?

22. Was/is the work supported by the executives in the organisation? Did you get clear mandate to work with ES?

23. What, according to you, needs to be developed in relation to the ES work? [*Also What*]

24. [*If relevant, maybe also questions if one can collaborate around different perspectives; if they discuss in the organisation; if there is space to discuss and develop their work with ES,* etc.]

Final questions

25. What do you perceive as the most important aspects that the ES work has contributed/is contributing to in your organization's work? [*If possible, link to SEPA's work about making the value of ES visible in decision making, but be neutral not to impose any "right" answers*]

26. What kind of issue/plan/project would be most influenced if you use the ES concept, according to you?

27. Where would the use of ES concept make the largest difference?

28. If you personally were to choose something to work with, would you work with the ES?

29. Is there anything else you would like to tell us in relation to your work with ES?

Appendix B. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.ecoser.2018.03.00.

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