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Analytical framework and tool kit for SEA follow-up

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ABSTRACT

Most Strategic Environmental Assessment (SEA) research and applications have so far neglected the ex post stages of the process, also called SEA follow-up. Tool kits and methodological frameworks for engaging effectively with SEA follow-up have been conspicuously missing. In particular, little has so far been learned from the much more mature evaluation literature although many aspects are similar. This paper provides an analytical framework and tool kit for SEA follow-up. It is based on insights and tools developed within programme evaluation and environmental systems analysis. It is also grounded in empirical studies into real planning and programming practices at the regional level, but should have relevance for SEA processes at all levels. The purpose of the framework is to promote a learning-oriented and integrated use of SEA follow-up in strategic decision making. It helps to identify appropriate tools and their use in the process, and to systematise the use of available data and knowledge across the planning organization and process. It distinguishes three stages in follow-up: scoping, analysis and learning, identifies the key functions and demonstrates the informational linkages to the strategic decision-making process. The associated tool kit includes specific analytical and deliberative tools. Many of these are applicable also ex ante, but are then used in a predictive mode rather than on the basis of real data. The analytical element of the framework is organized on the basis of programme theory and "DPSIR" tools. The paper discusses three issues in the application of the framework: understanding the integration of organizations and knowledge; understanding planners' questions and analytical requirements; and understanding interests, incentives and reluctance to evaluate.

1. Introduction

While the last five years have seen a rapid development of tools and methodological frameworks for ex ante Strategic Environmental Assessment (SEA), the ex post stages of SEA, that is assessment activities undertaken after the strategic decision has been adopted, have been far less researched. Two earlier articles addressed what we then saw as major gaps in SEA literature, namely the provision of concrete tools and methods to use in a SEA process engaged in predicting the impacts of a policy or plan. We thus looked specifically at appropriate methodologies to deploy in the ex ante stages of a SEA (Finnveden et al., 2003; Nilsson et al., 2005). Since then, there has been a surge of SEA applications and associated methodological development. Still, the ex post stages of SEA, or the more mainstream term "SEA follow-up" (a distinction will be discussed in 2.1), are surprisingly little addressed and often treated almost in passing both in SEA research and practice (Cherp et al., in press). A more systematic and ambitious approach to SEA follow-up is therefore only emerging, and has so far primarily revolved around existing thinking within EIA (Arts and Morrison-Saunders, 2004). The nascent literature have outlined the basic concepts, functions and possible roles that the follow-up can take on (e.g. monitoring, evaluation, communication, management), but have still relatively little to say about concrete tools and sequencing of activities in particular ex post policy and planning situations. Similarly, SEA regulations and guidelines are held at such a general level that desk officers face a severe lack of concrete tools to fulfil the required follow-up.

The aim of this paper is to develop a theoretically and empirically grounded framework of tools for SEA in the ex post stages of decision making. We have chosen as our empirical basis practices and analytical needs in different types of regional planning. This empirical grounding is necessary to anchor the framework in reality but also comes with a cost, since more precise tools and analytical needs depend on the specific decision-making context. Still, we have endeavoured to construct a tool framework that will be broadly relevant not only for different levels of strategic decision making (be it policy, plan, or programme) but also for different sectors. The framework complies with the minimum requirements of official SEA

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regulations but also offers possibilities to engage in applications that are more ambitious in terms of promoting knowledge generation, learning, and organizational coordination.

The paper unfolds in the following way. In the next section, the paper will situate the framework in relation to existing thinking on decision-oriented SEA, SEA legislation, SEA follow-up literature, and programme evaluation theory. Following that we will summarise relevant results from our empirical studies into current practice of follow-up and evaluation in regional planning in Sweden, both in terms of generic and environmental follow-up. The theoretical and empirical discussion will address several dimensions of SEA that will shape the framework, including the temporal scope of analysis, the level of ambition in terms of programme evaluation, the character of the plan, the presence of environmental ambitions of the plan, and the organizational arrangements surrounding the assessment. From these inquiries, the core principles of the framework will be presented. In the ensuing section, a range and variety of different tools of potential use in SEA follow-up are introduced, after which we will deal with their organization and combination in a framework of tools. The final section discusses challenges and issues to be resolved when applying the framework.

2. Conceptual premises of the framework

This paper is primarily aimed at establishing a concrete tool framework. This means that we will not dwell deeply into theoretical questions nor the legislative frameworks surrounding SEA follow-up (see Persson and Nilsson, 2007). Still, a few principal departure points need to be established.

2.1. Decision-oriented SEA

In the last ten years, SEA research (and to a lesser extent practice) has come to realise that in order to be effective, the SEA needs to engage explicitly with decision making and ensure that it becomes influential as early as possible in the process. This "decision-oriented" school emphasises that a) SEA is a process that runs in parallel with the decision-making process, including its preparation, as opposed to only providing an impact statement in time for the formal decision, and b) that decision making itself is an iterative cycle of problem understanding, objective setting, searches for solutions, analysis, decisions, evaluations, and learning feeding back into revised problem understandings and objectives (Partidario, 2000; Pischke and Cashmore, 2006). If we accept this premise, it follows naturally that the ex post stages of SEA are critical to consider, and that they are indeed as significant as the ex ante stages, although they have been more or less neglected in SEA to date. This situation is not unique to SEA by the way; scholars of policy analysis have suggested that evaluative knowledge has been systematically under-utilised in policy and planning more broadly (Weiss, 1977; Dunn, 2003).

Fig. 1 shows the generic SEA relation to the planning sequence according to the decision-oriented model of SEA, with key informational connections. The lower, shaded, part "Ex Post Stages" is the focus of our study. It is well-recognised that strategic decision making such as planning and policy making is not linear and phase-wise in the manner implied by Fig. 1. Most decision-making processes, in particular those involving complex decisions and multiple actors are quite unpredictable and chaotic (Kørnøv and Thissen, 2000). This poses a dilemma for SEA analysts that wish to establish replicable and defined frameworks and procedures. This is an underexplored problematique in SEA (Nilsson and Dalkmann, 2001). Nonetheless, a predefined framework can still be useful — also in a chaotic and unpredictable world (Fischer, 2003). In this paper we use a relatively linear representation not as a realistic descriptor of decision making but as a heuristic aid to start mapping functions and tools. In reality there may well occur surprises and unexpected inputs along the way, as well as multiple feedback loops and informational flows up and down the diagram.

It should be noted that in reality, ex post activities are not necessarily following up on anything like a completed SEA. Rather the SEA is, as mentioned above, seen as comprehensive process consisting of both ex ante and ex post stages that relate to corresponding stages in whatever decision-making process it is linked to. The issues of ex ante and ex post are present in evaluation literature also, as highlighted in work surrounding the European structural funds (see, for instance, European Commission, 1999). The term SEA follow-up arguably assumes the presence of a report to follow-up on. Is it then not possible to conduct ex post SEA without an ex ante SEA? We argue that in the chaotic real world this is indeed not only possible but often the only option, and our framework needs to allow for that possibility. Indeed, as will be shown later on, in the current situation of planning in Sweden, there is little or no practice of SEA to build on in the ex post stages of the decision-making process. Information ideally provided in the ex ante SEA (such as objectives and criteria indicators) will in its absence need to be captured elsewhere as part of a scoping exercise. Therefore, our framework has informational connections both to the ex ante stages of SEA, the plan/programme/policy (PPP) implementation process and the regular monitoring or evaluation process.

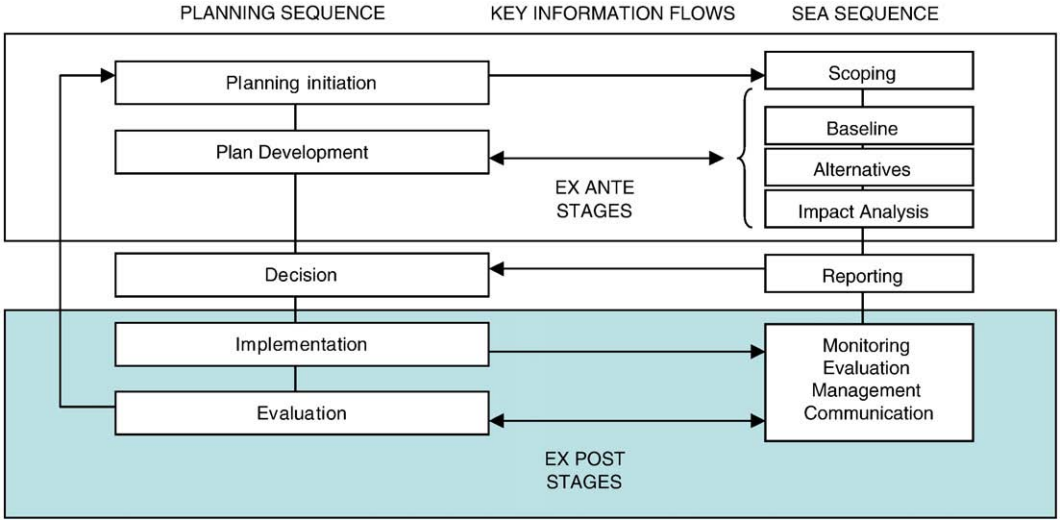

Fig. 1. SEA sequence and connections to planning.

2.2. The legislative requirement in the European directive

The ideas behind "decision-oriented" SEA are today relatively uncontested among SEA scholars. Still, it is not explicitly articulated in most existing legislative frameworks, which like the European "directive on the assessment of the effects of certain plans and programmes on the environment" tend to focus on the provision of an environmental impact report (European Parliament and Council of the European Union, 2001). Nevertheless, there are provisions relating to follow-up in the directive. Article 10 addresses the implementation phase and lays down the obligation to monitor the significant environmental effects of the implementation of plans and programmes. This should enable a comparison of the predictions of the (ex ante) assessment against the effects which in fact occur. According to the accompanying guidelines the methods chosen should be those which are available and best fitted in each case to seeing whether the assumptions made in the environmental assessment correspond with the environmental effects which occur when the plan or programme is implemented, and to identifying at an early stage unforeseen adverse effects (European Commission, 2003). There is thus no explicit instruction as to what might be appropriate tools and procedures to perform this follow-up. The Commission also suggests that if possible, the follow-up can be satisfactorily integrated in the regular planning cycle, and it may therefore not be necessary to establish a separate procedural step for carrying it out. Monitoring may coincide for example with the regular revision of a plan or programme, depending on which effects are being monitored and the length of intervals between revisions. Similar ideas have been put forward in EIA, where jointly following up economic, social and economic impacts is considered the new direction in EIA (Arts and Morrison-Saunders, 2004).

2.3. Existing debates in SEA follow-up

The mainstream conceptions of what happens in the SEA follow-up are the provision of monitoring, evaluation, communication and management (Morrison-Saunders and Arts, 2004; Cherp et al., in press). These are generic functions but they do not provide a sequenced approach in the way that we would require from a tool framework. Focusing on the monitoring and evaluation activities as the major analytical elements for tool use, we consider that the management aspects (to ensure the meaningful use of the assessment in the decision-making process) and therein relevant communication aspects (ensuring effective information flows between the assessment and the decision-making process) need to be explicitly accounted for in the tool framework we wish to propose.

The SEA literature on the other hand describes several different levels of ambition and different foci of the follow-up. Partidario and Arts (2005) provide a "multi-track approach" in which several different scopes and levels of ambition of SEA follow-up can be envisioned. They contrast tracks with a more limited ambition of simply monitoring activities or environmental quality against those with a higher ambition to come to understand the causal links and relations between PPP processes, outputs and outcomes, and the environmental impacts. In practice, SEA has (if at all engaging in follow-up) often limited itself to accounting for impacts, that is monitoring of the outcomes. However, in order to enable organizations to learn about what works or not, one also needs to be able to *explain* what has led to the impact (Persson and Nilsson, 2007; Cherp et al., in press). This ability to explain an outcome is a minimal requirement for "instrumental" or "single-loop" learning to take place, that is learning that enables a system to understand what works and why and develop a better capacity to achieve its objectives (Argyris and Schön, 1978). However, there is also a more profound "conceptual" or "double-loop" learning in which organizations learn also about their strategies, objectives and priorities themselves, and not just how to achieve them (Hertin et al., in press). In order to provide for such more profound learning processes where one also deliberates on the objectives and purposes put into practice in the plan, a third element of *judgment* is critical, where one calls into question not only the programme design in relation to the objectives, but also the objectives themselves and even underlying problem understanding. Such an approach is typically more demanding and intensive in terms of stakeholder engagement and deliberation, and links to what Arts and Morrison-Saunders (2004) refer to as the multi-stakeholder approach for EIA follow-up.

2.4. Learning from programme evaluation

This three-step classification *accounting–explaining–judging* from evaluation research triggers us to construct a framework in a way where it does not delimit itself to monitoring but allows encompassing more ambitious aspects of evaluation. We would also like the framework to be able to call into question assumptions of an intervention and more freely choose criteria for judging the outcomes than those set out in the plan or SEA report. To help us do that, the fields of implementation and programme evaluation are relevant bodies of research with a solid conceptual and empirical basis. Indeed, implementation literature gives the basic raison d'être for ex post activities, since there is often considerable room for interpretation in the implementation on behalf of actors in charge of realising the programme. Do environmental considerations maintain their status through implementation or is there an "implementation deficit" (Jordan, 2002)? Imprecision and fuzziness of the programme output might have helped its development but makes implementation harder; actors adjust policies in relation to their administrative capacity and policy understanding; and procedures for feedback influence the attention paid to the policy (Pressman and Wildavsky, 1973; Lundqvist, 1994). Hence, during the implementation of an initiative, the predictions and plans made in the decision preparations, including the impact analysis, must be followed up.

But also when the implementation is rather fixed, evaluation literature teaches us that it is necessary to assess whether the predictions made in the planning and preparations were accurate. This is referred to as the intervention theory or programme theory — how the intervention is intended to be implemented and function, and the examination of this in relation to actual outcomes are important aspects in all evaluations (Vedung, 2000). On this, we have endeavoured to learn as much as possible from insights in evaluation. In particular we wish to bring into focus the examination of causality, a core concern in programme evaluation, but to date less of a concern in SEA practice, and one in which SEA legislation and guidelines have tended to be ambiguous (Persson and Nilsson, 2007).

There are two contrasting perspectives in implementation and evaluation studies. The top–down perspective studies the implementation of a particular intervention in terms of its goal attainment and examines whether the results are in line with the original goals (Vedung, 2000). The bottom–up perspective studies the effects from a stakeholder perspective with less connectivity to the actual programme. Effects on different stakeholders, whether planned or unplanned, are in focus (Bogason and Sorensen, 1998). The latter model is also called the goal-free model because criteria can be independent of the original goals, and instead based on other stakeholder concerns. This conforms with a pluralistic view on policy, which in evaluation terms is manifested in the development of methodology for multi-organizational policy analysis. The evaluation is typically seen as a democratic instrument as opposed to the expert-driven top–down perspective (Hjern, 1982; Wagle, 2000). Earlier attempts to combine and synthesise bottom–up and top–down perspectives have been made (Sabatier, 1986) but so far there has been little of such synthesis in the development of practice in SEA and evaluation. Our framework does not aspire to such an analytical

synthesis but encompasses tools developed within both traditional top–down evaluation (the above-mentioned programme theory), and bottom–up evaluation (predominantly participatory tools).

3. Lessons from the real world of planning

It is one thing to construct a framework of tools purely on the basis of theory, legislation, normative principles and what tools are available. It is quite another to engage in understanding real-world practices as a basis for constructing a framework. Yet, this is critical for the relevance of the framework amongst practitioners. In particular, one needs to understand and take into account the nature of change that much of public decision making has undergone in the last decades. This change is particularly evident in regional planning. First, through decentralisation and regionalisation processes, the practice of regional planning is today in many countries navigating in a grey zone between state-administrative implementation of national policies and regional political processes. Second, in many Northern European countries, having scaled back top–down plans where detailed infrastructure investments and other measures are timed, financed and detailed. Instead, much planning, at least on the regional scale, has turned into multi-organizational and consensus-oriented types of programming aimed at reaching common views on visions, objectives and overarching strategic directions, but often excluding the identification of concrete investments and budgets. There are thus changes both in what planning is supposed to achieve, what a planning document contains, and what the process of planning looks like. The reasons for this shift are manifold: the diminishing capacity of the state to control development in the face of new governance modes (where private and civil society organizations have more implementation power) (Pierre and Peters, 2006), an intertwining of public and private sectors (de Bruijn and ten Heuvelhof, 2000), and major interest in new mechanisms of participation and consensual decision making (Wiklund, 2005). But whatever the reasons, this change has caused profound problems and uncertainties regarding how planning is – or should be – supported by knowledge and in particular how it can be evaluated. Conventional types of planning support tools, such as EIA or more recently SEA, have major troubles staying relevant for these new processes. When there is no real plan of objects to be implemented, what is the object to appraise or evaluate?

At the same time, some infrastructure plans at municipal and regional levels still operate in a more traditional mode. As will be shown below, our framework tries to accommodate the functional challenges associated with both traditional plans and more cognitive programming processes. Our empirics consist of two comprehensive surveys into the practice of follow-up and evaluation in two types of planning processes in Sweden. The regional growth programmes, representing a cognitive and multi-organizational planning process (Wiklund and Hillgren, 2008), and the regional transport infrastructure plans, representing a more traditional plan of "objects" (Lundberg, 2006) (see Table 1). In addition we have looked closer at four specific cases, two for each type of plan, with in-depth interviews studies to understand in more detail why the practice looks the way it does (Henningson, 2008; Jonsson and Tyskeng, 2008; Wallgren, 2008), Space constraints force us to just draw out the key messages and lessons that are relevant for the continued discussion rather than a full account of these results.

3.1. The character of the plan

Regional transport infrastructure planning is the responsibility of the County Administrative Boards (the national government's regional office). It involves public roads except those of national importance, transport infrastructure constructions, from which governmental subsidy can be approved, and other constructions of importance. The plan document should contain information about the standard of roads and constructions, needed investments and measures, scheduled constructions during the timeframe of the plan, cost calculations, and an assessment in relation to transport policy objectives. Regional transport planning thus involves a traditional identification of investment objects and implementation. The main challenge from a follow-up perspective is that the plan only covers local and regional investments in the sector, whereas big roads are part of the national plan. It is therefore impossible to distinguish the broader effects of the regional plan from those of the national plan. Several case study respondents suggested that the actual objects in the regional transport plans are so small and without direct environmental effect, that the SEA seemed unnecessary.

Table 1
Ideal type differences between the two types of plans

	Transport Infrastructure plan	Regional growth programme
Sectoral focus	Sectoral	Multisectoral
Level of concretisation in plan outputs	Clearly defined investment objects	Strategic issues with development themes
Participants	Few actors from public sector within the sector	Multiple actors from public, private and voluntary sectors across different sectors
Steering mechanism	Administrative coercion (authority decision)	Voluntary agreement and partnership without formal decision power
Financial mechanism	Clear financial budget in the plan	No clear financial resource, each partner contributes after individual decisions project by project
Formal documentation	Administrative documentation (by civil servants in agencies)	Political documentation (partnership with politicians etc.)

Regional growth programmes were set up by the government in the early 2000s to be the basis for creating favourable development conditions from a local and regional perspective with the needs of local business and enterprise in focus (Government Bill, 2001/02:4). The programme document should analyse regional development conditions, identify development objectives, and establish priority intervention areas and a plan for financing, implementation and evaluation. The multi-actor and consensus orientation is manifest in the "partnership" concept surrounding these programmes. The financial aspect is unclear in the sense that the different actors take their own decision about participating in different projects (not the programme as such). Regional growth programmes are thus an example of the new type of cognitive process and consensus building within planning. Regarding follow-up, the multi-sectoral character of the regional growth programmes poses strong procedural demands, and reinforces the relevance of multi-organizational policy analysis. Furthermore, due to its integrative nature, it is very difficult to establish what impacts are relating to programme itself.

We surveyed the practice of follow-up and evaluation generally and specifically for the environment in all 21 regions in Sweden. Below we will discuss a) to what extent there is a general follow-up practice in relation to these two types of plans, b) to what extent environmental aspects are taken into account and c) the organizational arrangements surrounding the planning. We draw out lessons that serve as input to the construction of the framework.

3.2. The level of ambition in general plan follow-up and evaluation

Our surveys showed that proper evaluation is not really institutionalized. Instead, regions engage in what they call "object follow-up", which is simply to monitor whether objects identified in the plan have been realised or not. In general follow-up we found the following relatively meagre activity, relatively consistent between transport plans and growth programmes: 50–60% have a project data base; 75–80% send annual reports to the state; 60–65% have thematic evaluations irregularly; and 50% have operational indicator systems.

Many respondents in the transport planning survey testified to the need to strengthen general follow-up practice — going from monitoring-type work of "object follow-up" to more advanced evaluation (Lundberg, 2006). The regional growth programmes currently have more of systematic follow-up both regionally and nationally, but these activities need better coordination (Wiklund and Hillgren, 2008). For example, it is not efficient for 21 regions to compile in parallel basic sets of official statistics such as employment or Gross Regional Product. This is better handled at the national level. The regional follow-up and evaluation should instead focus on regional-specific conditions and in-depth probing. As already noted, the multi-sectoral and increasingly strategic/thematic-oriented programme logic poses huge challenges on the evaluation of impacts. Impact measurements are not directly attributable so establishing causality will depend on in-depth studies with a more advanced methodological design. In parallel one needs qualitative and participatory approaches to grasp local and context specific knowledge and experiences concerning impacts.

3.3. The presence of environmental aspects in planning and follow-up

In the case of transport planning, environmental issues are not part of the follow-up activity. They are present in the ex ante process, but more as general policies and they are not formulated in a way that enables monitoring or evaluation (Lundberg, 2006). The situation is similar for the growth programmes: according to the governmental instruction they shall be formulated based on a sustainable development perspective where economic, social and environmental aspects are integrated (Wiklund and Hillgren, 2008). Instead, planners refer to the County Administrative Board responsible for the regional monitoring of the national environmental quality objectives. However, these representatives argue that their job is to fulfil the national environmental objectives and not to establish causality or look at the effects of specific plans. Nonetheless, at least in the case of transport planning, the combined competence appeared generally sufficient to perform adequate SEAs including follow-up.

In both the transport plan and growth programme surveys, desk officers in only 4 out of 21 regions were familiar with the requirements in the SEA directive. Many respondents voiced deep concerns about how difficult it was to comply with the law here, and that questions of how to do SEA had yet not been properly discussed, much less understood. Tools, frameworks and techniques were also seen as missing. The lack of a systematic framework makes it hard to separate direct environmental effects from indirect long-term effects as well as the accumulated effects related to the plan. To be able to explore the collective knowledge as efficiently as possible, the use of a uniting framework was seen as critical, in particular to build the connection between planning follow-up and environmental follow-up in the region (see below).

Stakeholder engagement in follow-up was virtually unknown — in particular when it comes to environmental issues. The regional growth programmes went through certain follow-up activities focusing on the participant actors' experiences and concerns regarding the implementation of the programme. In addition, the partnership arrangement of the growth programme may function as an important arena for more informal follow-up. Herein lays an unrealised potential because follow-up increases the understanding of why certain things are done in certain ways, which is important from a learning perspective, but also as it increases the status of the planning process among citizens and in the society as a whole.

In sum, our survey and respondents testified to a great need to enhance the environmental perspective and capacities in the planning process and in its follow-up, and that SEA could be a (yet untested) means of achieving this. It is noteworthy that many respondents could identify what existing competencies would be necessary to combine and made a strong plea for more guidance concerning frameworks and tools.

3.4. Organizational coordination issues

Different regions have made different organizational arrangements for follow-up. In the case of transport, some are handled by the County Administrative Board and some are handled by the regional office of the National Road Agency. While the regional level lacks evaluation procedures, instead external bodies, including the responsible national agencies, perform monitoring and evaluation. This creates organizational coordination issues, both vertically (from national to regional) and horizontally (between those in charge of environmental objectives follow-up and those in charge of plan follow-up at the regional level). At present, there is no such coordination taking place in the case of transport planning. In the growth programmes, on the other hand, there is a relatively strong structure for follow-up at the regional level. The primary problem here is that the existing structure is not used much. In addition, there is follow-up at the national level, carried out by national agencies.

The organizational situation points to a strong need to improve coordination of existing structures and routines. At the regional level a number of plans and programmes can be framed within a generic definition of regional development programmes, for instance structural funds, rural development programmes, regional development programmes, regional growth programmes and also transport plans addressed here. By coordinating the follow-up of these programmes it should be possible to get a more comprehensive picture of the regional situation. In addition there are formal regional environmental objectives that require monitoring. These are handled by the Country Administrative Board and reported to the national level. Coordinating planning follow-up with these environmental objectives needs further consideration. This would entail integration horizontally and also anchoring vertically to the national level. Through the regulated follow-up of the environmental objectives there is a clear opportunity to strengthen the environmental dimension in the overall evaluation of both transport plans and growth programmes. Such solutions are also in line with the guidelines to the EU directive which emphasise the importance of making use of existing planning systems and linking them together.

4. Constructing a tool framework

Based on our theoretical and empirical accounts above we have deduced the following core principles to guide the development of the framework. First, the framework should promote a more learning-oriented use of SEA in strategic decision making, as suggested by the evaluation concept reviewed in Section 2. It therefore includes an explicit stage of learning and communication (see Fig. 2 below) that enable organizational and analytical coordination of the SEA with the "mainstream" follow-up of the economic and social aspects of the plan, which should help to ameliorate rather than deteriorate the organizational coordination issues discussed in Section 3.

Second, and linked to the learning orientation, the framework should enable the SEA to go beyond accounting-type monitoring towards a more evaluation-like approach involving tools for both explanation and judgment according to the three-step classification discussed in Section 2. It will therefore deploy tools in the analytical stage that together enable the discussion of causality as well as deliberations concerning objectives. However, it should also be adaptive to different analytical needs in different types of planning situations, implying that there will be different tools to choose from or that tools are applied differently.

Third, the framework should be adaptive to differential data availability and resource constraints resulting from the differentiated capacities and levels of ambition in the planning system discussed in Section 3. Since this is always a concern, the framework will provide a structure for evaluative knowledge that as far as possible builds on existing environmental monitoring and other relevant datasets rather than the creation of new ones. Existing data sets will however not

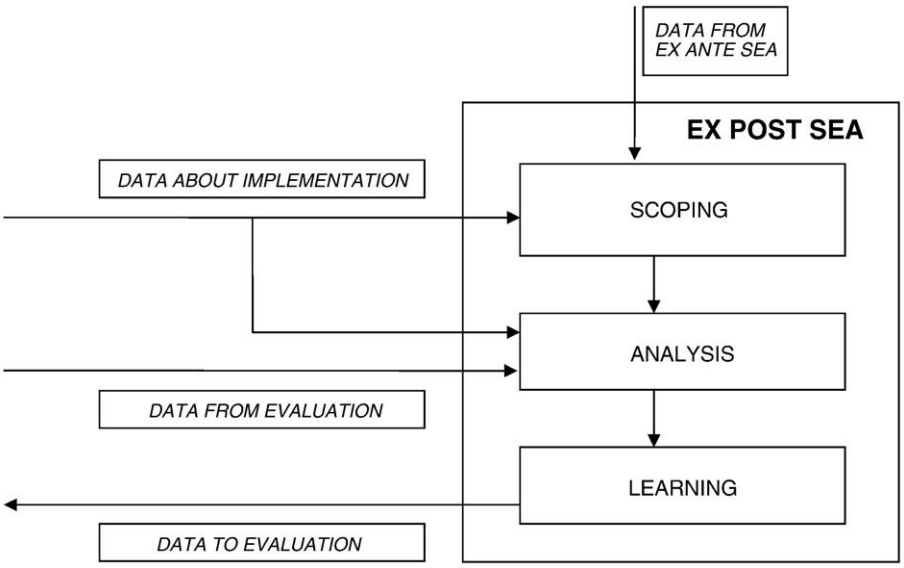

Fig. 2. Basic components of SEA follow-up and communication links.

fulfil all informational requirements. Therefore, the framework builds in the potential for using data generated by environmental systems analysis tools.

Fourth, the framework needs to be responsive and adaptive to organizational voids, that is for instance the possible non-existence of an ex ante SEA, and needs therefore to be functional on its own terms. This means to deploy a set of tools to define the scope and objectives of the exercise. In a scoping stage (see Fig. 2), the framework should combine top–down impulses such as national environmental quality objectives of the previous plan with bottom–up procedures.

There is an extensive array of methods and tool that can be more or less fruitfully put to use in SEA applications (Finnveden et al., 2003; Therivel, 2004; OECD, 2006). The main analytical question at this stage is, what function can the tool be expected to have within SEA follow-up? In the next section we describe a selection of tools that we consider can be particularly helpful in SEA follow-up based on our defined set of principles. In Fig. 3, we have defined a number of functions or tasks associated with each stage of the ex post SEA; scoping, analysis, and learning. Different tools have then been identified to fit into these tasks and stages. The account below will present tools under each stage, but it should be noted that some tools can play an important role in more than one stage.

4.1. The framework structure

Different tools, discussed in more detail below, fulfil different functions and provide different kinds of information. To enhance the framework's usefulness it is necessary to understand what tool is useful for what kind of information. We suggest a "meta-tool" to organize information needs and suggested tool uses, combining the programme-theory framework (PTF) from programme evaluation with the DPSIR indicator framework from environmental systems analysis.

4.1.1. Programme-theory framework

The programme-theory framework (PTF) is arguably the key contribution from evaluation research to our framework (Dunn, 2003; Weiss, 1998). Using a programme-theory framework is particularly useful for mapping out the causal chain. A programme theory is about understanding the premises on which the plan is based. Although long established in evaluation literature, PTF has not typically been a part of evaluation practice but during the last decades the evaluation community has come to realise that in order to be able to make a judgment it is necessary to look carefully not only what the plan is expected to achieve but also how it intends to achieve it. It should be noted that a programme theory does not need to be very formal or complicated — it can be simply the beliefs about how things will work that underlie the planning decisions. Most importantly, it does not have to be right! (Weiss, 1998) But it does specify a chain of causal assumptions that link inputs, processes, outputs and ultimate results, as well as account for preconditioning factors and unforeseen events, that are beyond the control of the decision maker, but that very often have determining effects on the ultimate outcomes and impacts (Fig. 4). It triggers the analyst to collect data on each of these factors and consider how they are related.

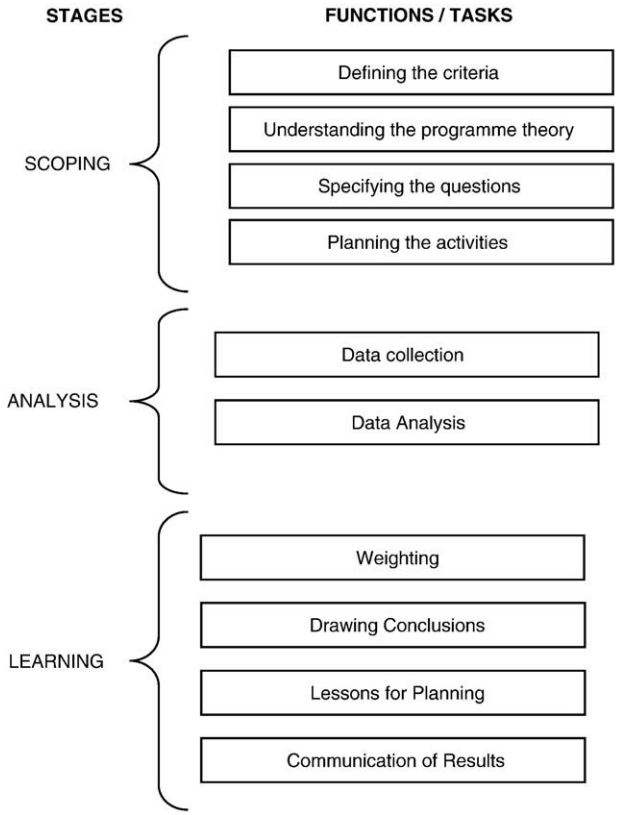

Fig. 3. The functional components of ex post SEA.

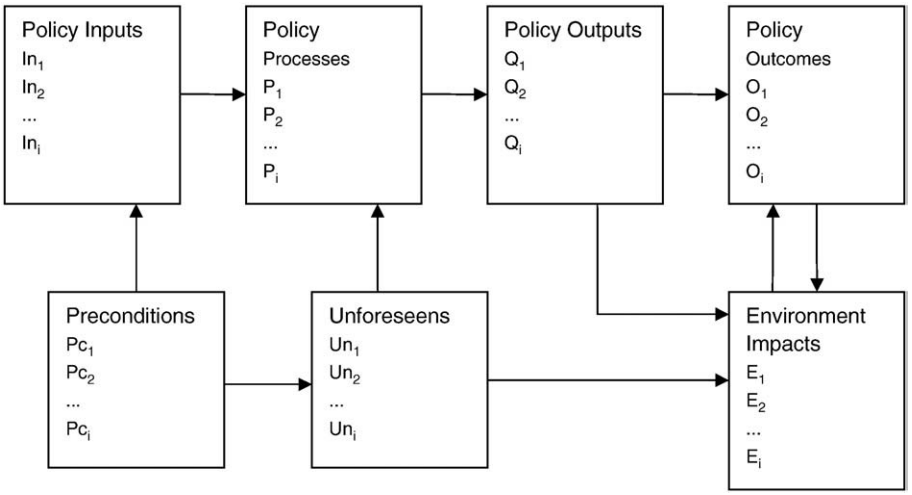

Fig. 4. Programme-theory framework (adapted from Dunn, 2003).

4.1.2. DPSIR framework

DPSIR is a general framework for organizing environmental information and indicators. It was originally developed by the (OECD, 1994) where it was limited to "PSR", and later expanded and applied extensively in many contexts including in EEAs reports (EEA, 2005). The framework aims at grasping the relationship between human activities and environment through a flow of processes. The framework describes the relationships between social, economic and environmental systems (Fig. 5).

- Driving forces of environmental change (eg industrial production)
- Pressures on the environment (eg discharges of waste water, emissions of air pollution)
- State of the environment (eg water quality in rivers, ambient concentrations)
- Impacts on population, economy, ecosystems (eg production losses, health impacts)
- Response of the society (eg policies, mitigation measures)

Similarly to PTF it prompts the analyst to consider indicators that are causally connected, but in contrast to PTF it zooms in on the effect chain in the environmental side and treats the planning and societal context as one box (Driving forces).

4.1.3. The meta-tool

DPSIR provides a concrete system for organizing different environmental data, but it lumps together all societal drivers, policy-related and others, in a very aggregate way. This makes it difficult to diagnose the policy arena or implementation situation. The PTF does the opposite: it treats the environmental impact side in an aggregate way but instead provides a disaggregated perspective on the inputs, processes, outputs and outcomes of planning/policy as well as events and trends outside the policy/planning realm. As the framework will have the role of both dealing with environmental concerns and getting a grip on the planning situation and its merits and deficiencies, we synthesise for the analytical stage the PTF and DPSIR frameworks to organize the analytical sequence. Fig. 6 shows the combination of the two into such a "meta-tool".

To simplify and collapse our approach and simplify the presentation of the framework, Fig. 7 shows the framework in a linear fashion, built upon the analytical sequence of the meta-tool, with connections to specific analytical tools, and also how they relate to various stages of the planning and follow-up process.

In the next section we will present the specific analytical and deliberative tools in a bit more detail. It should be noted that some tools can be used in several parts of the process, although the visual

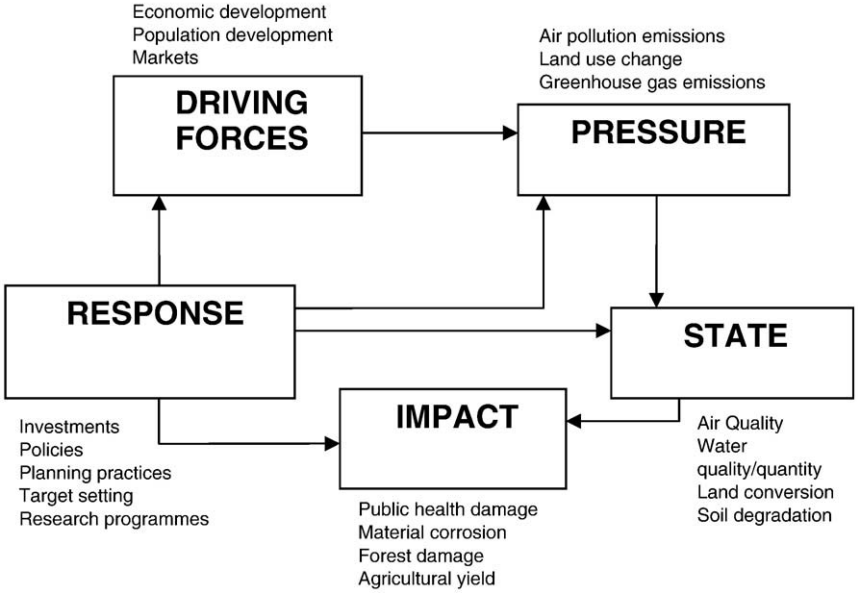

Fig. 5. The DPSIR framework with example indicators.

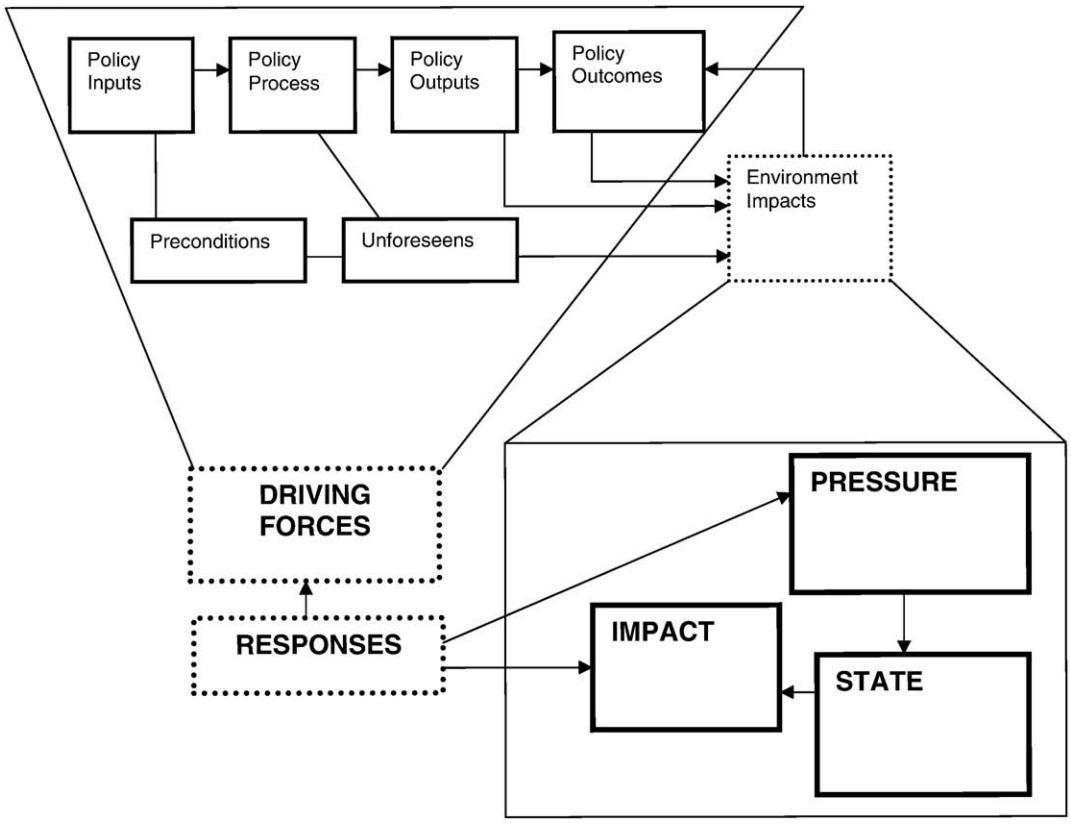

Fig. 6. Connecting DPSIR to PTF.

representation in Fig. 7 does not allow a comprehensive view of this. It should also be noted that several of them are also highly relevant in the ex ante stages of an SEA, but are then used in a predictive mode rather than relying on real historical data.

4.2. Tools for scoping

4.2.1. Concept mapping

The scoping can commence with the mapping of key concepts and ideas to be considered in the assessment. Planning and evaluation processes often encompass complex environmental and human interactions. This makes it difficult to develop a clear common understanding of the situation and what the assessment process is geared towards. A structured mapping exercise helps the participants to focus and develop a joint understanding in their own language. Different visualisation techniques can be used to provide information; pictures, concept maps, or concept "webs". With its pictorial representation and its participant-oriented features concept mapping can be a powerful method to organize complex problems. Concept mapping has been developed as a strategic planning tool across sectors, and is also sometimes used in market analysis in industry (Trochim, 1989). It often comprises two main stages. The first stage is the generation of systems factors and the second concerns the organization and prioritisation of these factors. As a key output of the exercise, the point-cluster map is generated, which displays the systems factors and their internal relations (Trochim et al., 2003). Concept mapping of impacts is used to define the effects that are to be examined and associated indicators. It may be particularly useful in cases where there are multiple objectives or where these have not yet been firmly established or if they lack precision (Tavistock Institute, 2003). The tool can be combined with focus groups in particular if one is concerned with aggregating assessments for the purpose of reaching consensus between different stakeholders.

4.2.2. Environmental objectives frameworks

A system of national environmental quality objectives defines the state of environment which environmental policy aims to achieve and provide a coherent framework for environmental programs and initiatives at national, regional and local level (Government Bill, 2004/05:150). The objectives combined describe a vision in which all major environmental problems are solved "within one generation". For each of the objectives a number of interim targets are formulated. The interim targets are a mix of activities that have to be carried out, and descriptions of actual states in the environment (as measured by certain indicators). The interim targets aim at providing short-term guidance on what action and change is needed in order to meet the long-term objectives. The system, which has been implemented in Sweden in the early 2000s, has been criticized for being imprecise and difficult to evaluate and also for not having enough of a bottom–up character, and it could be questioned to what extent the objectives in reality are perceived as legitimate and binding targets at the local and regional levels. Nevertheless, in Sweden, the environmental objectives have been "regionalized" for each county, thus providing an interpretation of what they mean for specific geographical areas. In Sweden, the progress towards achieving the environmental quality objectives is monitored and evaluated annually at the regional level. Thus, the system of regional objectives provides an important structure and understanding of national policy from which to gain general information about changes in overall environmental conditions in the geographical area in which a plan or programme is being implemented. It also provides the horizontal organizational coordination with the environmental monitoring organization at the regional level.

4.2.3. Integrated assessment focus groups

Focus-group elicitation is a participatory method for collecting qualitative data through a carefully planned group interview (Swartling, 2002). It intends to capture the perceptions, knowledge and experience of participants in a permissive and non-threatening

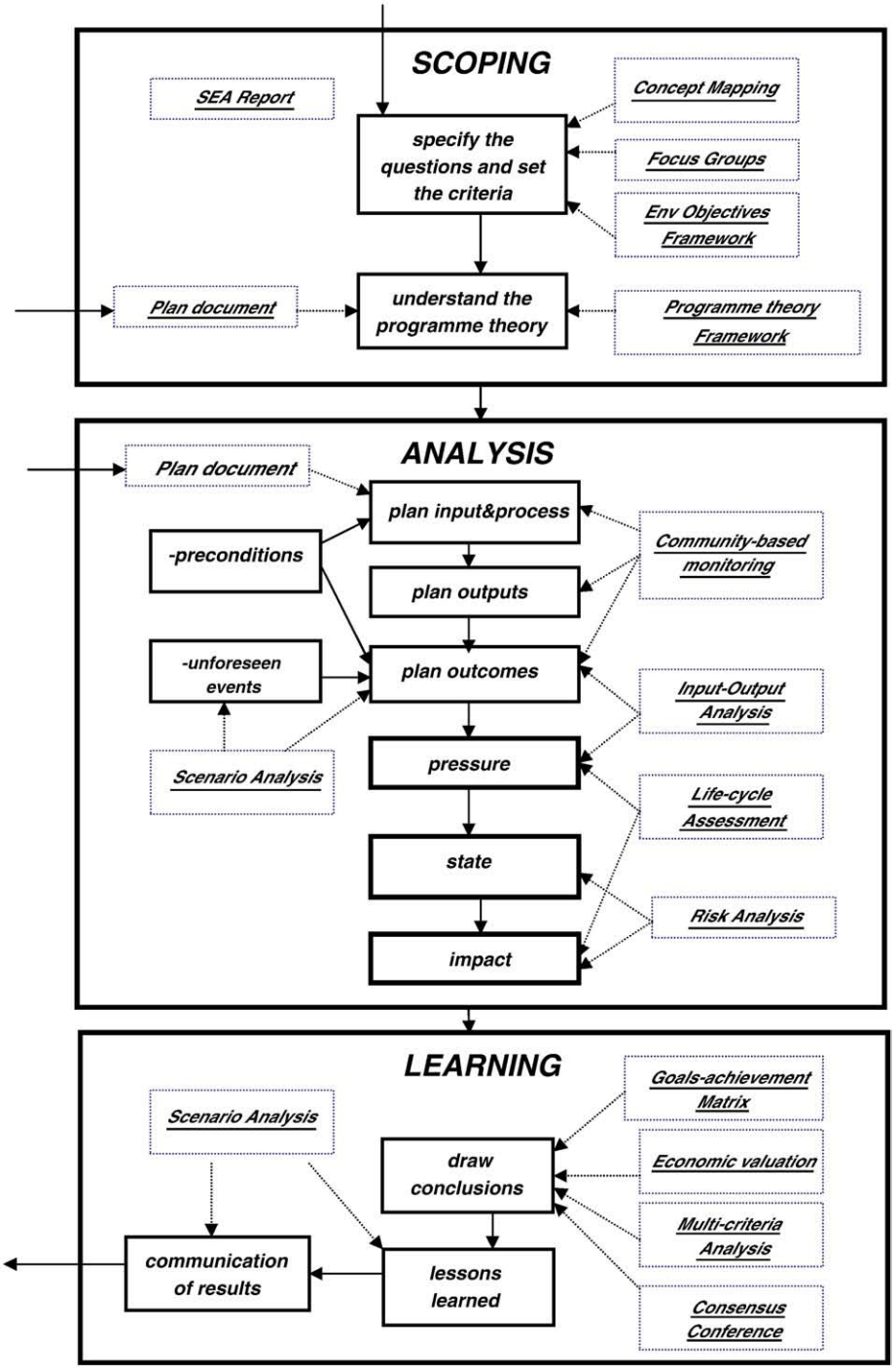

Fig. 7. Tool framework for SEA follow-up.

environment. It works from a set of predefined questions. Focus groups have been popular with the environmental research community in eliciting local knowledge for environmental management. It is less common in the evaluation community. In recent years, there have been fruitful experiments with combining focus-group elicitations with advanced data and computer tools within so-called "integrated assessment" research (Dahinden et al., 1999). These tools help participant explore and express their knowledge, interests and preferences. In relation to ex post SEA, this promises to be very helpful in both the scoping, analysis and learning stages although its primary role is likely to be in the learning stage, when analytical data are available. Although it is not pre-determined, a focus group may well be tasked to reach a common policy recommendation. Key analytical choices to be made within a focus group include: the selection and recruitment of participants, the choice of supporting tools and data input, the duration and sequencing of meetings, and the form and content of the focus-group report.

4.3. Tools for analysis

4.3.1. Life cycle assessment

Life Cycle Assessment (LCA) is a method to assess the environmental impacts and resources used throughout a product's life from raw material through production, use and disposal. The term 'product' can include also services, e.g. waste management. An ISO standard has been developed for LCA providing a framework, terminology and

some methodological choices (ISO, 2006). An LCA is divided in four phases: Goal and Scope Definition, Inventory Analysis (which is a compilation of the inputs and the outputs of the system (Rebitzer et al., 2004), Life Cycle Impact Assessment (LCIA), and Interpretation. Within LCIA, the first elements aim at describing the contribution from the studied system to a number of environmental impact categories such as resource depletion, human health impacts and ecological consequences. One of the optional elements of LCIA is called weighting and includes a valuation of different impact categories against each other. This may include economic valuation methods or multi-criteria analysis further discussed below. LCA has proven useful within impact analysis of SEA (Nilsson et al., 2005; Salhofer et al., 2007). An LCA needs data on policy outcomes which thus need to be collected either empirically or modelled or assumed based on policy outputs. The LCA will then produce results also on the level of policy outcomes, e.g. concerning which up-stream and down-stream processes can be affected by the first-order policy outcomes. In relation to the DPSIR framework, LCA will produce results on both pressure and on impacts.

4.3.2. Input–output analysis

Input–output analysis (IOA) is a well-established analytical tool within systems of national accounting studying a nation or a region (Miller and Blair, 1985). The input–output tables describe trade in monetary units between different sectors of society. Taking the example of food production, the table shows from which sectors the food industry are buying products and services, such as the agriculture sector but also transports and machinery, as well as to which sectors the food industry sells their products, for example households and restaurants. The IOA can be applied to include environmental impacts by adding emission factors to the table, describing emissions per monetary unit from each industrial sector. This enables the calculation of environmental impacts from broadly defined product groups and sectors. Such environmentally extended IOAs have been used in connection with product LCA (Lave et al., 1995; Suh and Huppes, 2005), sector analysis (Engström et al., 2007) and EIA (Lenzen et al., 2003) to include indirect effects. In SEA follow-up it can be useful to calculate environmental impacts from for example changes in economic activity. In order to be useful, information must however be available on monetary flows between different industries and these may change (or have changed) due to policy. Thus information is required on policy outcomes which can be modelled, assumed or empirically gathered. The IOA will then generate new information on the level of policy outcomes (e.g. concerning affected industry sectors) and on environmental pressure data.

4.3.3. Risk assessment

Risk assessment is a broad term covering many different types of assessment, for example assessments of chemical substances, accidents, food safety, and comparative risk assessments. Risk assessment of accidents is typically done prospectively for different types of projects and certain types of industries. It concerns unplanned incidents, e.g. explosions and fires whereas in risk assessment of chemicals, dispersion of chemicals is often foreseen and forms part of its use. In the risk assessment of chemicals, an exposure assessment including a description of nature and size of exposed targets, as well as magnitude and duration of exposure, is combined with an effect assessment (Eduljee, 1999; Olsen et al., 2001). The exposure assessment is usually done using some sort of model. Risk assessment of substances can also be performed for a specific project. In these cases, site-specific methods for the exposure assessment may be used. Such assessments may for example be integrated in an EIA to assess the risks for the population in the vicinity of a new plant. Different procedures for comparative risk assessment of policy proposals have also been developed (Hofstetter et al., 2002). These may include a broad assessment of health risks including environmental aspects but also health impacts associated with for example socio-economic changes. Since risk assessment is such a broad group of methods, it may be used in different ways within SEA follow-up. It often uses statistical or modelled information on pressure and calculate impacts or in some cases state indicators, but monitoring data may also be used as inputs, both for the exposure assessment and the effect assessment.

4.3.4. Community-based monitoring

Community-based monitoring is a tool for data collection that includes a range of activities through which concerned citizens gather and record systematic observations about environmental or social conditions, often in collaboration with government industry, academia or community. The popularity of citizen monitoring groups has increased since the 1990s. Few groups are project specific: much more common approaches are area-based and concerned with effects from multiple potential sources. They are, consequently, at least potentially better equipped for the identification of cumulative effects than project-based approaches. Standardised protocols for data collection, specified methods for interpreting monitoring results, and databases for compiling data are examples of measures that can improve the quality of community-based monitoring. (Hunsberger et al., 2005)

4.4. Tools for learning

4.4.1. Goals-achievement matrix

A common way of representing complex plan or programme impacts in a disaggregated way is to use various kinds of matrix display systems (Tavistock Institute, 2003). These may use either qualitative or quantitative data, or combine the two. It can also be used to elicit ranking and prioritisation by asking experts, stakeholders or decision makers to assign numerical values to qualitative information. The most common form of the matrix is to indicate the goals and evaluation criteria on one axis (for instance regional environmental objectives) and the various alternatives or components of the plan on the other. The matrix can then include various additional spaces for comments or judgments, such as trade off analysis and summary statements.

4.4.2. Economic valuation

There are a large number of different approaches for monetising environmental impacts (e.g. Barbier, 2000, Bockstael et al., 2000) Different approaches for valuating environmental impacts capture different types of economic values and may thus not always be directly comparable. Methods based on individual's revealed preferences are assuming that people reveal their preferences in market behaviour. The revealed preferences are normally only related to the use values, e.g. the market price of timber. Contingent valuation method (CV) can capture also non-use values by asking individuals explicitly to place values upon environmental assets. Because of this, CV is often referred to as an expressed or stated preference method. CV methods have been used extensively and there are guidelines developed for them (Carson, 2000). A willingness to pay may also be derived from political decisions. For instance, the marginal cost for removing the pollutant to the emission limit or environmental taxes can be seen as monetary values the society puts on the pollutant.

Valuation methods tend to be rather cumbersome if applied “from scratch”. There is in LCA a number of available simplified methodologies for valuation which can be used also within the SEA context (Steen, 1999; Itsubo et al., 2004; Finnveden et al., 2006). However, there are limitations in these methods. There may be difficulties in assessing monetary values to certain types of environmental impacts, and there may thus be severe data gaps in some of the available methods. In principle valuations can be made on Pressure, as well as State and Impact levels. Since all impacts are valued and measured in one common unit, environmental impacts can in principle be compared with other types of impacts from the policy. The critique against economic valuation has been powerful when it comes to environmental and social issues, since it is argued that many of the

most important impacts cannot be adequately measured in monetary terms. The option then is to refrain from aggregating into a single measure of monetary units, and to move into a multi-criteria analysis.

4.4.3. Multi-criteria analysis

Multi-criteria analysis (MCA) establishes preferences between options referring to a set of objectives established by the decision maker. In some cases, the identification of objectives and criteria in the goals-achievement matrix may actually provide enough information for the decision makers to decide based on an informal judgment, but in some cases, the level of detail in the information makes it so complex that a formalised approach to aggregating data is warranted.

There is a wide range of techniques in the field of multi-criteria analysis, ranging from qualitative and workshop orientated to heavily analytical model-based tools. MCA techniques can be used to identify the single most preferred option, to rank options, to create a short list, or to separate acceptable from unacceptable options (Dunn, 2003). The selection of MCA methodology depends on many factors, such as the time available, the type of decision, the nature of the data to support the analysis, the analytical skills of those involved, the cultures of decision making and the legislative requirements on the decision-making process. A core question is whose preferences the scores and weights represent. In all planning contexts different actors interpret things in very different ways. Ideally, the selection of objectives should not promote particular economic or environmental agendas but need to encompass the major concerns of the region as a whole. This entails official priorities and strategies, but may also include concerns articulated by non-governmental actors, such as scientists, environmentalists, or community organizations.

4.4.4. Consensus conference

The consensus conference is a tool for interpreting data, conducted as a dialogue open to the public between a panel of lay people and experts. In the consensus conference, citizens hear from predefined experts and are allowed to form conclusions by consensus within a tightly pre-determined remit. A total of 13–16 citizens make up the panel. Although not meant to be statistically representative, the small, diverse group participating is a cross-section of a wider population. The panel receives a thorough briefing on the subject. They formulate questions to address at the conference. A chairman who is not an expert on the subject is present through the whole discussion. After the conference the panel drafts a final consensus document with recommendations. (Andersen and Jaeger, 1999)

4.4.5. Scenario analysis

Scenario analysis can play an important role in ex post stages of planning. Scenario analysis can be divided into predictive, explorative and normative types (Börjeson et al., 2006). Predictive scenarios respond to the question “what will happen?” and make it possible to plan and adapt to situations that are expected to occur. Explorative scenarios aim to explore situations or developments that are regarded as possible to happen from a variety of perspectives. This makes this kind of scenarios suitable to use as a framework for alternatives and assessment of the impacts of a development. Normative scenarios address the question “How can a specific target be reached?” and focus on how future situations or objectives can be realised.

Using scenario analysis ex post may seem counter intuitive since this is in essence a prospective approach. However, if we consider the cyclical character of decision making, in SEA follow-up, scenarios can be used both as a basis for learning and analysis. Similar to the use of ex ante SEA (Höjer et al., 2008) predictive scenarios are useful because all policy outcomes are usually not known at the time of the evaluation. In the learning stage, predictive and explorative scenarios can be used to evaluate whether the set objectives of the policy will be reached. If it is found out that the objectives will not be reached, normative scenarios, such as back-casting, can help in discussing how the goals can be reached in the next cycle.

5. The tool framework and analytical and organizational challenges

5.1. Summary discussion of framework

The presented framework and inventory of tools is not exhaustive and have an element of subjectivity since it is inevitably coloured by the authors' own knowledge and experiences. However, we consider it to be fairly comprehensive in that it covers all main elements and functions that have been identified as necessary in an ambitious SEA follow-up process, involving tools for scoping, data gathering, processing, consultation, weighting, drawing conclusions and presentation (see Fig. 3). Table 2 summarises and comments upon main roles of the different tools within the framework.

This paper argues for, and bases its framework on, a perceived need for a stronger knowledge generation that enables not just the accounting of results but also explanations, and this in a multi-organizational planning context that needs more coordination but also enhanced abilities to learn from assessment. This is in essence a multi-faced challenge which is unlikely to be fully resolved through one comprehensive framework. Nevertheless, the framework does address these multiple challenges in a concerted way. The combination of tools that systematise and structure, such as PTF and DPSIR, with tools that generate systemic data, such as IOA, ensures that critical knowledge is usefully provided. The inclusion of deliberative tools, such as focus groups and consensus conferences ensures that bottom–up concerns are taken into account, as well as provides an operational basis for organizational coordination. Finally, the overall informational connections of the framework and specific tools therein, such as the scenario analysis, provide routes for organizational learning from SEA follow-up. This will, if resourced adequately, contribute to enhancing the knowledge base of real-life planning while accepting all its political, cognitive, and organizational constraints.

The framework is intentionally broad and rich in tools and we are not suggesting that any particular SEA follow-up would deploy all these tools to their full capacity — far from it. There is a logical sequence but also flexibility in adaptation and dealing with certain steps in a more simplistic or non-systematic manner. Real follow-up processes will of course take on many different forms and shapes, depending on for instance the sectors concerned, the institutional context, the knowledge level and commitment to environmental issues. Therefore, the precise application of the framework will be quite different from one case to another. The selection of tools, the level of ambition in deploying them, and the informational connections (and level of integration) between the SEA follow-up and the generic follow-up cannot be generically determined. To make these choices, one needs to consider a range of analytical and organizational issues, which are spelled out in more detail below. There are also other more practical considerations that will influence the choices within the framework, such as what is economically and politically feasible. Such aspects are beyond the scope of this paper, but it is obvious that the contextualization of the framework must be made in the light of these practical realities of planning.

5.2. Understand the integration of knowledge and organizations

Based on our empirical study, it is clear that the existing knowledge and capacities in the collective of organizations tasked with planning, evaluation and regional environmental monitoring in many cases would be sufficient to provide for an adequate SEA follow-up process according to the principles discussed earlier. What is needed is the coordinated and systematic approach to draw this knowledge together and apply it in a focused way. But how can organizations that need to interact be coordinated? How can other relevant stakeholders be

Table 2
Summary presentation of selected tools

	Scoping	Analysis	Learning	Main function of tool (see Fig. 3)	Other comment
Programme-theory framework	X	X	X	Understanding the programme theory, planning the activities, data collection	Critical for moving follow-up to *explaining* level
DPSIR		X	X	Defining the criteria, understanding the programme theory, planning the activities, data collection, lessons for planning	Critical for organizing data at *accounting* level
Concept mapping	X			Understanding the programme theory, specifying the questions	Useful for developing understanding and focus to complex problems
Environmental objectives	X			Specifying the questions, set the criteria, data collection	Provides structure for top–down assessment, connecting to policy at judging level
Focus groups	X	X	X	Data collection and analysis, drawing conclusions	Captures knowledge and perceptions for bottom–up assessment, connecting to stakeholders
Life cycle assessment	X	X	X	Defining the criteria, data analysis of pressure and state, weighting	Provides systematic and replicable procedure to understand systemic impacts and their origins
Input–output analysis	X	X		Specifying the questions, data analysis of outcomes and pressures	Models new knowledge about outcomes and pressures
Risk assessment		X		Data analysis of state and impact	Models new knowledge about states and impacts
Community-based monitoring		X	X	Data collection of process, output, and outcome, drawing conclusions	Useful to collect and interpret non modelled and non measured data
Goals-achievement matrix			X	Weighting	Useful to represent data in a disaggregated way to decision makers
Economic valuation			X	Weighting	Useful to aggregate data in "a language decision makers understand"
Multi-criteria analysis			X	Weighting, drawing conclusions	Useful to interpret, discuss and aggregate data
Consensus conference			X	Drawing conclusions, lessons for planning	Useful to get concluding statements within bottom–up assessment
Scenario analysis		X	X	Data analysis of outcomes, lessons for planning, communication of results	Useful to predict yet unrealised impacts, and analyse achievement of objectives over time

engaged in the process? The proposed framework will hopefully function not only as a tool kit but also a procedure that will enable the systematic use of the collective knowledge already available. Tools of deliberative character, such as focus groups, can be platforms for better coordination. However, this depends on strong commitment to the informational connections between the SEA follow-up and the planning process shown in Figs. 2 and 7. Organizational responsibility cannot be determined a priori but needs to be worked out in relation to the specific planning context. A particularly important input to this is the scope of the follow-up. In our cases of transport plans and regional growth programmes, we identified the need for broader systems boundaries than what is in place today. This can be achieved by integrating follow-up activities for different transport modes and plans, for instance road planning and railway planning, for various programmes aimed at regional development, and for regional and national plans. SEA follow-up at the regional plan level would then need to interact with planning and programming at higher (national) levels. One should consider further coordination or integration of follow-up between the regional growth programmes and the regional transport plans, as well as with other regional-level plans and commitments. Follow-up coordination is useful because all these development initiatives are linked in terms of cause and effect.

5.3. Understand planning issues and constraints

Analysts and experts tend to be disposed to responding to those questions that their particular expertise or tool addresses, rather than having the decision-making situation as their departure point. The authors of this paper are also to some degree guilty of this, but have attempted to control this tendency. Understanding the questions of the planners should be the basic premise to define the analytical needs. We have established an empirical basis for our tool framework, and we have provided a portfolio of tools broad enough to allow capturing a range of different functions, as well as participatory tools, such as concept mapping, that are explicitly designed to elicit concerns held by both managers and other stakeholders. Of course in the end it is the level of ambition and resources available to those charged with planning that ultimately determines the selection and combination of tools and in what depth one engages with any specific tool. The legal SEA requirement really only provides a minimum level of ambition, whereas the literature (such as this paper) tends to provide more ambitious alternatives. Is the level of ambition limited to monitoring or will the planners aspire to map or even measure causal effects? Do they have the ambition to have a strong element of public or stakeholder engagement in the process or is this not considered a priority? The scoping should entail a dialogue to clarify these questions and what the costs and benefits are of the different options. SEA analysts have, with this framework, a set of methods and tools to do systematic analysis, as well as the time to consider the substantive issues at some length. They lack, however, "soft" information about implementation — and the connections to get it. The line managers, on the other hand, have those things but lack the time to absorb and process the information. As Mintzberg (1994: 325) puts it: the dilemma is "how to couple the skills, time and inclinations of the planner with the authority, information and flexibility of the manager". Understanding in what form knowledge is absorbable, and when managers need it, will take us a long way.

5.4. Understand interests, incentives and reluctance to evaluate

Although most respondents agreed with the quest to learn more from the past, some failed to see the benefit of engaging in evaluation, suggesting that their task was to implement what has been decided, but not to question whether the effects were as intended or whether they were properly thought through from the start. It is well known that planners and managers often face a disincentive to engage in follow-up. Carol Weiss and others have illuminated that evaluative knowledge is rarely used instrumentally — if at all used then more as a political device than to really inform and improve the factual basis for decision making. Distinct fields such as evaluation research and science-technology studies (Jasanoff et al., 1995) have illuminated the same basic phenomenon from their respective fields: that despite a supposed instrumental rationality in the design and purpose of evaluation and assessment, real-world decision making faces such a broad and problematic range of political, cultural, cognitive and institutional constraints, that the real use of the knowledge frequently becomes something completely different. Over the years this problem has been illuminated in empirical work in a variety of domains such as the budgetary process (Wildavsky, 1979), social programmes (Shulock, 1999), urban planning (Owens et al., 2006), and national policy (Nilsson, 2006; Hertin et al., in press). The tool framework presented cannot resolve

the politics of planning and evaluation. Instead it relies on a perhaps naïve expectation of procedural rationality, albeit of a heavily bounded character. Having said that, engaging planners and decision makers in a scoping exercise for the follow-up, through appropriate tools such as focus groups and concept mapping, will generally serve to strengthen the ownership and incentive to use and learn from the follow-up.

6. Conclusions

This paper has developed a tool framework for SEA follow-up, based on principles derived from legal frameworks, SEA theory, evaluation theory, environmental systems analysis and planning practice. Starting from such principles the framework goes beyond the typical legal requirement in SEA follow-up and makes a more ambitious interpretation to enable organizational learning and coordination. The tool kit includes both analytical tools for expert use and deliberative tools oriented towards public and stakeholder participation. The tools can be useful both ex post and ex ante the actual decision and the defining feature of the ex post tools of SEA is that they build in observed data rather than predictive and anticipatory models. The tool kit puts a special emphasis on participatory tools because although they can play important roles they are often neglected in the design of assessment and follow-up. Examples of potential functions of participation in follow-up include: determining the purpose, scope and priorities for follow-up; gathering, presenting and interpreting data; and developing recommendations. The scope of follow-up activities cannot be generally determined but scoping activities are part of the framework itself.

Lessons from programme evaluation can strengthen SEA follow-up by giving it analytical rigour in relation to causal discussions and providing insights into the use and acceptance of SEA among decision makers and stakeholders. However, the implications drawn from theory and literature need tempering with an empirical understanding of what planning really looks like. Our surveys and cases showed that the gap is very large between text-book ideals about planning and evaluation and the real life. They revealed important institutional considerations that served as an input to the framework construction. Confronting text-book ideals with reality in planning and follow-up is a sobering exercise. For instance, the original question of how one might integrate the SEA follow-up within existing generic follow-up processes and structures (as many guidance documents suggest) became a rather moot point when it was found that there was hardly any of the latter going on. This prompted us to design a framework that was relatively "stand-alone", applicable in the absence of both other general follow-up and ex ante SEA. Nevertheless, most of our respondents acknowledged the importance and need of learning from follow-up and of integrating environmental concerns into this process. This allows us to be rather optimistic about the proposed framework serving as an inspiration and motivator for practitioners and researchers alike.

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