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Knowing the landscape: a theoretical discussion on the challenges in forming knowledge about landscapes

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ABSTRACT
Knowledge about landscapes is highly complex and it is important to clarify how that complexity is reflected in the knowledge claims that feed into a particular planning process. Thus, this paper addresses critical issues and challenges regarding the formation of knowledge about landscapes in spatial planning contexts, based on published landscape research and planning theory. The analysis is rooted in planning theorists' discussion of various types of knowledge claims involved in spatial planning practices. Thinking in terms of knowledge, and discussing both the character of knowledge production and types of knowledge claims that will be included, is a useful approach for choosing and developing assessment methods. To aid such approaches, two key aspects of formation of knowledge about landscapes are addressed here. One is the trans-disciplinary challenge of capturing landscapes as a whole. The other is the normative element of knowledge pertaining to landscapes, including diverging moral and ethical perspectives.

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1. Introduction

Knowledge of landscapes is an important foundation for any kinds of spatial planning decisions that change the use of land, such as planning of new transport structures, wind farms, housing, recreational sites or industrial complexes. In a spatial planning situation, knowledge about landscape can be used, for example, to inform decisions in order to minimise adverse impacts, protect identified qualities and enhance or add qualities.

Landscape development is prioritised at various levels of spatial planning policy. In a European context, the European Landscape Convention (ELC) (Council of Europe, 2000a) stipulates that any impacts of planned developments on landscapes must be carefully assessed. The ELC highlights the need to identify landscapes and assess them, and demands that each signatory commits to improving knowledge of its landscapes (Council of Europe, 2000a, art. 6 c). Accordingly, each party undertakes 'to identify its own landscapes throughout its territory; to analyse their characteristics and the forces and pressures transforming them and to take note of changes' (Council of Europe, 2000a, art 6 c). The terms characteristics, forces and changes imply that complex issues are involved in formation of knowledge about a certain landscape.

Methods for producing knowledge concerning landscapes, and related perspectives have been enriched and diversified by various disciplines. Landscape has long been a central theme in, for example, human and physical geography, landscape architecture and archaeology. In recent decades, researchers and practitioners rooted in other disciplines, such as anthropology,

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sociology, psychology, history and ecology, have also engaged in landscape studies (Stephenson, 2010). The development of various approaches for landscape assessments has been spurred and affected by numerous discourses and competing claims on (inter alia) nature conservation, sectoral land-use policies, land and resources, ecosystem services and sustainable development (Arts et al., 2017).

It is generally recognised that the knowledge required in planning embraces many types of evidence obtained through multiple types of methodology (Krizek et al., 2009), including various types of environmental data that raise substantial technical and methodological issues. These issues have been thoroughly addressed in the literature. For example, problems involving use of metrics such as sustainability indicators, the methods applied to obtain them, and environmental assessments in planning, have been intensively considered (Caratti et al., 2004; Geneletti & Bragagnolo, 2012; Hilding-Rydevik, 2007; Kørnøv, 2009; Partidário, 2000; Therivel, 2010). However, the diverse types of knowledge claims pertaining to landscapes potentially available, and the challenges faced when forming and assembling these claims, have received less attention. This diversity of claims and associated challenges are theoretically addressed here, based on information and concepts drawn from literature covering landscape research and planning theory. Knowledge about landscapes is highly complex and it is important to clarify how that complexity is reflected (or not) in the knowledge claims that feed into a particular planning process.

Of course, before discussing any kinds of knowledge claims pertaining to landscapes, we must define what is meant by the word landscape. Here a broad understanding of the term is adopted, as defined by the ELC: 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors' (Council of Europe, 2000a). The ELC regards natural, rural, urban and peri-urban areas as landscapes, as well as land, inland water and marine areas. It also states that landscapes that are considered outstanding, common or degraded are all important (Council of Europe, 2000a).

The aim of this paper is to problematise knowledge development of landscapes in the context of spatial planning. To meet this aim the paper is structured as follows. Section 2 considers the use of knowledge in spatial planning practice, based on published planning theory, to provide an understanding of knowledge in spatial planning contexts as a basis for further discussion. Section 3 presents previous attempts to categorise different types of knowledge used in planning, and their respective characters, particularly categorisations based on knowledge frameworks developed by Rydin (2007) and P. Healey (2007). The outlined understanding of knowledge in planning practice is then used to discuss knowledge production about landscapes in Section 4, in which I synthesise ideas from planning theory and landscape research to illuminate challenges in knowledge development. Conclusions based on the synthesised ideas are presented in Section 5.

2. The role of knowledge in spatial planning practice

Planning has been frequently described as a practice located between knowledge and action (Campbell, 2012; Davoudi, 2015; Friedmann, 1987; Rydin, 2007). Thus, the use of knowledge is regarded as a central element of spatial planning practice. Davoudi (2015) even conceptualised planning activity as a practice of knowing: 'To conceive of planning as [a] practice of knowing requires an understanding of the complex interrelationship between knowing *what* (cognitive/theoretical knowledge), knowing *how* (skills/technical knowledge), knowing to *what end* (moral choices) and *doing* (action/practice)'.

However, concepts of the nature of the knowledge, action and processes involved have evolved with time. Much attention in planning theory in the 1950s and 1960s was focused on the scientific qualities of decision-making processes (Campbell, 2012). Planning was considered a rational decision-making process in which value-free experts relied on evidence to solve well-defined planning problems (Davoudi, 2012). Evidence, obtained and applied by scientific methods, was understood as being capable of describing clear cause-effect relationships. The planning process was regarded as a rational process that could be structured in a set of logical steps.

The rational planning ideal has aroused intense criticism, partly because of difficulties in accommodating complexities, uncertainties, instability, uniqueness, power struggles and value conflicts (Innes & Booher, 2015; Schön, 1983). Moreover, favouring the 'rational' led to domination of deductive logic and use of instrumental reasoning formed by scientific analysis, resulting in planning processes where separating fact from value was seen as desirable when making choices (Healey, 2006a).

This criticism seems to have had potent effects. Notably, Tennøy et al. (2016) claim that a negative view of the use of expert knowledge, which can be traced to the critique of the rational planning models from the 1950s and 1960s, has arisen and disseminated in the literature. Authors have distanced themselves from ideals of an extreme instrumental rationality, which has led to disregard of expert knowledge. Clearly, this could be potentially catastrophic, if (for example) the knowledge concerned toxic effects of planned activities, such as release of contaminated groundwater. As an alternative, Tennøy et al. (2016) call for informed planning, in which knowledge produced by the scientific community or experts of various kinds plays an important role. This aligns with the notion of 'evidence-based practice', which has spread from medicine to other fields, such as business management and spatial planning. It builds on informed decision-making, based on best current evidence (Krizek et al., 2009), rather than, for example, outdated knowledge, strong but unproven practical traditions, or biased information from vendors of products or stakeholders. However, a problem that may occur in planning or other practices is that even if a sound evidence base is available it may not be used by practitioners in their decision-making, for several reasons. Among others, there may be a lack of interest or motivation to use knowledge, particularly if it conflicts with entrenched positions (Krizek et al., 2009).

Since the 1980s, planning scholars have strongly focused on planning processes, and investigated issues such as stakeholder involvement, citizen empowerment and effects of differences in the perceived validity of different types of knowledge on the power relations embedded in decision-making processes (Næss et al., 2013). Communicative planning theories have been developed that emphasise the collaborative, interactive, communicative, and participatory nature of spatial planning (Healey, 2003, 1997). A distinguishing goal in communicative planning is to involve a broad range of groups in efforts to provide socially fair development, guided by principles of discourse ethics (Sager, 2009a). Accordingly, planning procedures should be deliberative, with strong elements of relationship building and learning.

According to Hillier (2003), actors may see that 'strategic, instrumental powerplays and manipulation of information could result in more favourable outcomes for themselves'. She argues that understanding agonism and antagonism in planning can strengthen planning practice by forming an awareness of 'stakeholder's commitments to values to be a matter of identity and historical contingency rather than rationality' (Hillier, 2003). Thus, instead of trying to achieve consensus, planners should strive for democratic decisions that are partly consensual and respectfully accept unresolvable disagreements. Planners, according to Hillier (2003), also need to understand that power relations and competition are often intertwined in deliberative processes.

Planning research has also provided several examples of neoliberal ideas strongly affecting planning practice (Sager, 2009b; Watson, 2006) and what counts as valid knowledge in decision-making about planning strategies. In such cases, market values have been actively promoted and market rationality has been a 'taken-for-granted' norm that upholds a particular attitude to natural and non-human resources (Watson, 2006).

Another factor that has strongly influenced spatial planning practice and theory is the massive global surge in recognition of the need for sustainable development. An accompanying requirement is for capacity to integrate and manage diverse types of knowledge, concerning (inter alia) 'housing, transport, energy and waste, economic development, social inclusion, equality, diversity, biodiversity, green and blue infrastructure' (Perry & Atherton, 2017). Moreover, a need for co-production of knowledge has been recognised to deal with complex life-world issues, such as poverty, environmental deterioration and other pressing societal problems (Pohl & Hadorn, 2008).

However, co-producing knowledge in urban planning and design contexts is challenging. Diverse actors may be involved, including professionals from different disciplines and institutions, researchers, practitioners and local citizens as well as various stakeholders of civic society. All of these actors may have profoundly differing perceptions of a problem, its roots and implications. Thus, Rydin (2007, p. 61) suggested that 'planning should be conceptualised as a series of arenas in which a variety of knowledges engage with each other, with planners not just responsible for procedural aspects of the engagement but more actively involved in the co-generation of knowledge through testing and recognising knowledge claims'. According to Rydin (2007), the production of knowledge involves giving voices to the various actors who have relevant knowledge claims in the planning context, and in this process planners need to recognise the positions of actors with varying power. She identifies the need not only to provide space for various claims (opening-up), but also for testing and ultimately recognising these claims (closing down). However, she concludes that contemporary planning theory has focussed on opening-up much more than the closing-down processes.

3. Characters of different types of knowledge claims

In planning theory, it is generally acknowledged that different types of knowledge used in planning practice are inescapably intertwined, fusing science and politics, facts and values, norms and techniques (Davoudi, 2015). They include knowledge of diverse elements of physical, political and cultural contexts, existing plans and policies, current situations and trends (Tennøy et al., 2016). Diverse types of information sources are also used, including statistics, existing plans, environmental assessments, scientific reports, and communications from stakeholders and the public. The diverse types of knowledge claims involved in spatial planning practices, and the significance of awareness of the diversity, have been discussed by planning theorists. However, in planning theory literature there is no clear agreement on the forms of pertinent knowledge and the important distinctions (Healey, 2006b).

Rydin (2007) suggests a classification of knowledge claims within planning to assist understanding of the different kinds that planners deal with (Table 1). She argues that knowledge of social, economic and environmental states and processes is essential for formulation of actions that will lead from current states to preferred outcome states. She also acknowledges that experiential and empirical accounts of current states and analyses of societal and environmental processes are all value-laden. For example, value judgements are embedded in choices of state descriptors.

Moreover, society is not static but constantly moving towards new patterns, so predictive knowledge gleaned from formulation and assessment of future scenarios under specified trends is needed. This type of knowledge is generally expert-led and based on current and past experience rather than arguments about future trends. Given the complexities involved, forums for examining the causal

Table 1. The classification by Rydin (2007, Figure 1, p. 60) of 'knowledge(s) and the planning process'.

Type of knowledge claims (Rydin, 2007)	Description (Rydin, 2007)	Category (Rydin, 2007)
Current state	Empirical account of current socioeconomic and environmental situation	Experiential/ empirical
Predicted state	Prediction of future scenario under specified trend conditions	Predictive
Societal processes	Process understanding of social, economic and environmental processes affecting society	Process
Planning processes	Process understanding of planning	Process
Outcomes state	Empirical account of outcomes of planning processes in specific societal context	Experiential/ empirical
Planning—societal interactions	Process understanding of how planning and societal processes interact to create outcomes	Process
Normative knowledge	Understanding of desired goals for planning	Normative

models and methods underpinning predictions are also needed for formation of the required predictive knowledge (Rydin, 2007).

In addition, goals and visions are formulated in planning that proclaim desired outcome states, so knowledge of desired states has strong normative elements, but their formulation requires knowledge of current situations, processes and possible futures (Rydin, 2007). Moreover, if all stakeholders' interests are to be met, the formulation of goals and visions for planning must be based on debate in which a wide range of voices can be heard (Rydin, 2007).

Since planners aim to generate specific effects, they also clearly need to understand the impacts of specific strategies and planning measures (Rydin, 2007). Hence, knowledge of causal relationships is important in planning practice, in order for planners to distinguish between effective and less effective or counter-productive measures (Næss & Saglie, 2000; Rydin, 2007). Planners also need knowledge that will help them think about the justification, acceptability and operationalisation of strategies. To identify such knowledge and assist its application, Healey (2007) has formulated a graphical model with two axes for sorting the various forms of knowledge used in spatial planning (Healey, 2007). As shown in Figure 1, 'implicit' and 'explicit' knowledge are distinguished vertically in this model, while 'systematised' and 'experiential/practical' knowledge are distinguished horizontally. Thus, four fundamental classes of knowledge are recognised, each with various sub-classes. Healey (2007, p. 246) acknowledges that experiential knowledge cannot be easily assessed, but holds that 'It demands institutional space and time in which people can identify and articulate their experiences'.

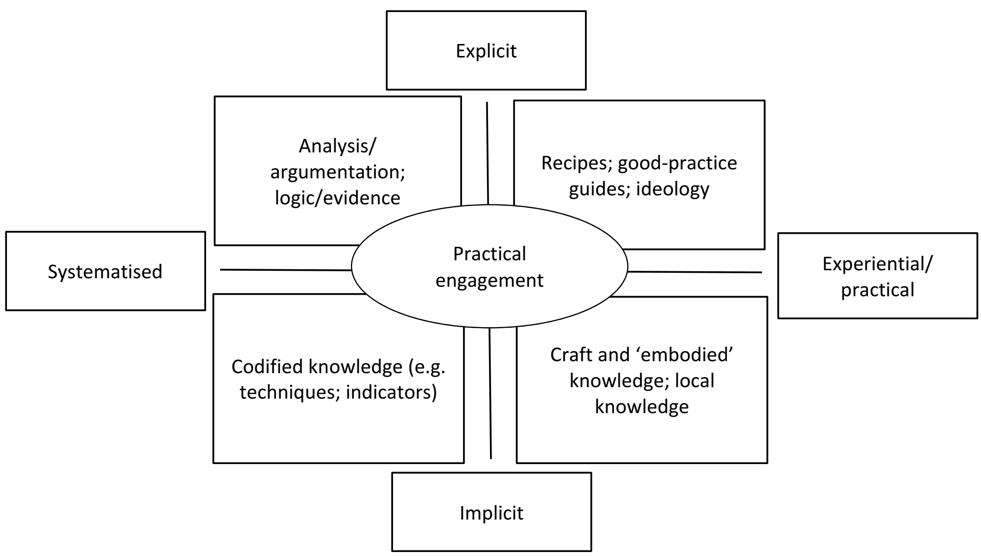

Figure 1. The 'forms of knowledge' model presented by Healey (2007, Figure 8.1, p. 245).

4. Challenges in forming and assembling knowledge about landscapes

Here, I discuss the differences in types of knowledge claims pertaining to landscapes, using the categorisation presented in the previous section, and problematise the development of knowledge pertaining to landscapes in the context of spatial planning.

4.1. Holistic treatment of landscapes

In the traditions of geographical, ecological and landscape architectural research, a landscape is conceptually regarded as a spatial entity, that is, an area of a certain physical character (Tress & Tress, 2001; Zonneveld, 1989). The Guidelines for implementation of the ELC state that the identification, description and assessment of landscapes involve 'analysis of morphological, archaeological, historical, cultural and natural characteristics and their interrelations, as well as an analysis of change' (Council of Europe, 2008. §1.1B). The Explanatory Report to the ELC further stresses the importance of understanding landscapes as a whole (Council of Europe, 2000b). An important notion in such holistic understanding of landscapes is 'the site in context', which implies that a landscape feature cannot be understood in isolation from its wider environment (Antrop & Van Eetvelde, 2017; P.H. Selman, 2006). The ELC also recognises landscapes as essential components of people's surroundings, expressions of the diversity of their shared cultural and natural heritage, and foundations of their identity (Council of Europe, 2000a). Thus, according to the ELC, a landscape can be understood both as a territorial entity with certain characteristics, and a culturally defined way of seeing and perceiving an area. Hence, knowledge of landscapes encompasses both material and immaterial aspects (Olwig, 1996).

Brunetta and Voghera (2008) argue that landscapes should be understood in terms of the relationships among different systems: the geomorphological, environmental-ecological, cultural-historic and socio-economic systems as well as the systems of settlement and users of the territory. Hence, there is a need to integrate knowledge claims with profoundly different characters (e.g., claims regarding natural and cultural phenomena as well as material and immaterial aspects). Moreover, knowledge about landscapes may range from diverse experienced-based views to highly technical expert-based assessments.

As already mentioned, the idea of wholeness implies a need to clarify the interrelations between different aspects of landscapes (Council of Europe, 2008. §1.1B), such as the relationships embedded in 'social-ecological systems' (Matthews, Berkes et al., 2003; Hermann et al., 2011; P.H. Selman, 2006; Wu, 2013). The social-ecological system concept combines the concepts of ecosystems and social systems. Ecosystem is a term used in ecology to describe an assemblage of organisms interacting with the physical environment within a specified area (Pickett et al., 2004). Myriads of interconnections among organisms in nature, and how these interconnections contribute to the persistence and functioning of an ecosystem, have been described (Martin et al., 2016). The general term social includes, in this context, social, cultural and economic systems, which have also been extensively described (Berkes et al., 2003). Social-ecological systems provide multiple services, and changes to landscapes often affect each service in different ways. One challenge is to describe the interdependencies of landscape functions in relation to spatial locations (De Groot et al., 2010). Different types of land use influence system properties, processes and components that service provision relies upon, so a change in land use will cause changes in a range of services provided by affected ecosystems (De Groot et al., 2010). For example, the recreational function of a landscape depends not only on the land cover at a specific location, but also on the accessibility and other characteristics of the surrounding area (De Groot et al., 2010).

Regarding the two sets of systems as coupled enables consideration in spatial planning of both synergistic and conflicting elements of social and ecological stewardship (Wilkinson, 2012). As mentioned, planners must understand the impacts of strategies and planning measures that could potentially be applied, in order to obtain desired effects. Thus, knowledge of synergistic and conflicting elements of strategies is important.

A system perspective that seeks to illuminate relations of social and natural dimensions of a landscape should include attention to ongoing and predicted changes of landscapes, and the processes involved. The Explanatory Report to the ELC reflects the idea that landscapes evolve through time, due to effects of both natural forces and human beings (Council of Europe, 2000b). Landscape transformations are driven by several interrelated factors, including for example, population growth, urbanisation, economic factors, and technological development. Landscape change occurs when there are changes in the main type(s) of land cover, which also cause structural changes (Mander & Antrop, 2003). For example, another landscape is formed when new land uses result in larger fields, particular treatment of the soil, terrain levelling, removal of hedgerows or enlargement of roads (Blaschke, 2006).

Rydin (2007) argues that knowledge of social, economic and environmental states and processes is essential for formulation of actions that will lead from current states to preferred outcome states. As goals and visions are formulated in planning that proclaim desired outcome states, knowledge of possible realities and possible futures is required (Rydin, 2007). Thus, in a spatial planning context it is important to understand possible future directions for sustainable landscape development. Prediction of landscape changes in scenarios incorporating specified trends plays an important role (together with descriptions of landscapes' current states) in assessing risks and opportunities associated with planned developments. Inter alia, predictions can highlight potential problems, such as losses of biodiversity or green recreational areas in an urban environment. When describing current states and making predictions, an important factor to consider is that landscape changes occur along gradients of land-use intensity (Plieninger et al., 2015; Rounsevell et al., 2012). Thus, it is important to consider not only amounts of types of land cover when describing landscape states or changes, but also ways in which each type of land is managed. Scenarios of possible future landscapes must be based on sound understanding of both landscape systems and processes (Antrop & Van Eetvelde, 2017). Given the complexities involved, forums for examining the causal models and methods underpinning predictions are also needed for formation of the required predictive knowledge (Rydin, 2007).

In an international review of different types of landscape characterisation methods, Simensen et al. (2018) conclude that all approaches involve consideration of interactions between human and natural factors. However, no single method can address all aspects of a landscape. Formation of holistic knowledge of a landscape requires identification of a particular area for the construction of knowledge, and inclusion of multiple sources of knowledge. This process paradoxically involves delimitation and categorisation of fields of knowledge. Different methods for analysing and describing landscapes involve specific sorts of reduction, with exclusion of some types of knowledge claims, clarification of some types, and prioritisation of others. Hence, the choice of landscape assessment methods will determine what types of knowledge are actually presented as foundations for planning decisions. Therefore, I argue in line with Simensen et al. (2018) that the relevance of a landscape assessment approach should be judged in relation to the decisions to be made, that is, the kind of effects the decisions will have on the landscape.

As outlined above, understanding of the types of knowledge that spatial planners deal with, based here on Rydin's classification of knowledge claims, can be used to frame and discuss the types of knowledge pertaining to landscapes that should be applied in planning decisions. When choosing and developing landscape assessment methods to be used in a particular planning process we need to consider how foundational knowledge of landscapes is produced. Inter alia, it is important to consider or acquire:

(1) Experiential and empirical accounts of landscapes' current state,
(2) Process and system understanding of social and ecological processes affecting landscape changes,
(3) Prediction of future landscape scenarios under specified conditions,
(4) Goals and visions that proclaim desired landscape outcome states.

We also need to discuss how the trans-disciplinary challenge of forming knowledge of landscape is handled, that is, issues regarding the treatment of and interrelation between different types of knowledge. As noted by Healey (2007), knowledge may be either implicit or explicit in character. Some types of knowledge are systematically produced through technical analysis and expressed through quantitative results, while others are experiential and based, for instance, on people's personal knowledge of daily practices in a particular landscape.

4.2. Normative dimensions of landscape knowledge

Analyses and descriptions of a landscape are value-laden. This applies to both experiential accounts (people's experiences of a landscape) and empirical accounts (developed through scientific methods) of current states and of both societal and environmental processes (Rydin, 2007). For example, value judgements are embedded in the choice of descriptors of states (Rydin, 2007). As noted by Termorshuizen and Opdam (2009, p. 1041) 'Landscapes are spatial human-ecological systems that deliver a wide range of functions that are or can be valued by humans because of economic, sociocultural and ecological reasons'.

Due to their importance, several schemes for classifying landscape values have been investigated in landscape research (Brown, 2005; Butler, 2016; Davenport & Anderson, 2005). Butler (2016) categorised values that have been ascribed to landscapes in landscape character assessments (LCAs) in the following classes: economic (including subsistence and market values); natural significance (including diversity and wilderness aspects); aesthetic, scenic and recreation (covering both active and passive enjoyment); cultural significance (including elements associated with identity, learning and history); and aspects relating to spirituality and sense of place. These are not exclusive, but they illustrate the diversity of values and potential ease of neglecting values that are not recognised and accepted in a spatial planning process (Butler, 2016).

Furthermore, landscapes can be valued from an intrinsic or anthropocentric perspective. An intrinsic perspective implies that spatial entities, places or ecosystems have inherent values by virtue of intrinsic properties (Batavia & Nelson, 2017). In contrast, an anthropocentric perspective is rooted in the view that only humans have intrinsic value and thus warrant direct moral consideration (Batavia & Nelson, 2017). Batavia and Nelson (2017) argue that the idea that nature has an intrinsic value as salient as the value of humans, is a moral proposition (but so, of course, is the opposite idea). Similarly, Martin et al. (2016) argue that nature and natural entities deserve a certain kind of moral respect, independently of human purposes because natural entities have their own dynamics and interdependencies in an ecosystem regardless of human utility.

Ethical duties may be derived from consideration of intrinsic values, and the kinds of human actions and behaviour in relation to nature that are most compatible with them, and hence 'right'. Martin et al. (2016) argue that knowledge of the biophysical and ecological limits of the planet can provide both moral motivation for respecting nature and indications of ways to do this.

A number of ecosystem service frameworks have been produced (e.g., Millennium Ecosystem Assessment, 2003) that describe and provide methodology for assessing service 'values' of nature. Thus, they are inherently based on an anthropocentric perspective, and have two major components (Abson et al., 2014). One is a *descriptive framework* purporting to portray the interdependencies of humans and natural systems (Collins et al., 2011). The other is a *normative framework*, which ascribes values to particular system states (Reyers et al., 2010). However, a strong emphasis on systems knowledge (descriptive understanding of social and ecological systems) has been detected in a review of contributions of ecosystem services research to different types of knowledge required for sustainability (Abson et al., 2014). In contrast, little attention to normative knowledge (judgements of how a system ought to be) or transformative knowledge (concerning the management of ecosystems to promote societal goals derived from normative knowledge) was detected. Furthermore, few studies have reportedly used vocabulary related to justice and ethics, and hence addressed concepts for making normative judgements regarding systems' management (Abson et al., 2014). These findings indicate that it is difficult to include normative concepts that transparently ascribe values to certain aspects or properties of systems, or that some kinds of management action are regarded as self-evidently appropriate.

Partly for these reasons, there is a risk of knowledge formation about landscapes being treated more as a scientific than an ethical endeavour. However, rather than trying to avoid the ethical and moral aspects of landscape perspectives, they should be fully incorporated in discussions about the choice of landscape assessment methods in spatial planning. This is because there are important ethical questions to address in the process of forming knowledge about landscapes, such as what is right and wrong regarding our relation to, use and management of a landscape, and in relation to possible intrinsic values of nature. Those involved in spatial planning seek knowledge that will help them think about the justification, acceptability and operationalisation of strategies—'the how and why of particular interventions' (Healey, 2007). Planners need to understand the character of the reasoning that is provided about a landscape. Thus, there is a need to feed knowledge about landscapes into planning that deals with difficult moral and ethical issues regarding the landscape, and the pros and cons of strategies to develop a landscape in a certain manner. Furthermore, the moral stances underlying assessment methods and proposed development strategies should be more deeply considered when forming knowledge bases of landscapes for planning purposes.

As noted by Walker and Salt (2006), the resilience of many productive landscapes has been seriously compromised, for several reasons. Notably, agricultural intensification involving cultivation of monocultures of high-yielding varieties coupled with increases in chemical and mechanical inputs has resulted in loss of biodiversity and critical ecosystem services in agricultural landscapes (Landis, 2017). The primary goal, for decades, has been to maximise the production of specific components in the systems by controlling others, which often entails planting all the available land with a single high-yielding variety and maximising growth. Walker and Salt (2006) argue that the current 'best practice' in agriculture is based on optimising the delivery of a particular product. This 'optimisation' promotes strong prioritisation of a few quantifiable and marketable values, with corresponding demotion of the importance of unquantifiable and unmarketable values of landscapes (Walker & Salt, 2006).

The studies cited in the preceding paragraph highlight the economic and political interests involved in land use issues. 'Best practice' arguments for landscape management may be formulated as objective and science-based, but may nonetheless be fused with economic and political interests. Examples include the previously mentioned cases of neoliberalist ideas strongly affecting planning practice (Sager, 2009b; Watson, 2006) and relative values of different types of knowledge in decision-making, as well as the active promotion of market values, and upholding market rationality as a 'taken-for-granted' norm (Watson, 2006).

Partly to counter such tendencies, in landscape planning literature it is often argued that environmental decision-making should be built on a commitment to foster diverse forms of participation by experts and the community (Tadaki et al., 2017). Participation of local residents within a particular landscape is needed to understand the values held by local stockholders through their daily activities, experiences and personal observations (Fagerholm et al., 2013). Participatory planning is advocated for providing opportunities for social and institutional learning, development of trust and relationships as well as a common understanding of a landscape—its history and possible future changes (Selman, 2010). However, providing arenas for and leading such processes are challenging tasks, so efforts to engage stakeholders, enhance the public's influence and limit prioritisation of powerful stakeholders' interests and values may have disappointing results (Calderon & Butler, 2020). Hence, Calderon and Butler (2020) argue that greater attention is needed in participatory landscape planning practices to differences, conflicts and power structures regarding landscapes and their political nature. 'Instead of only aiming for consensus outcomes, the focus of certain processes would be to help participants better understand (the legitimacy of) their own values and interests and those of their opponents; unpacking the roots and types of differences and conflicts that may exist and finding tailored ways to manage them, without necessary consensus' (Calderon & Butler, 2020, p. 8). Thus, in formation of knowledge about landscapes both diverging and possibly conflicting perspectives should be clarified, thereby enhancing transparency in spatial planning decisions.

5. Concluding remarks

This paper addresses critical issues and challenges regarding the formation of knowledge about landscapes in spatial planning contexts, based on published landscape research and planning theory. The analysis is rooted in planning theorists' intensive discussions of different types of knowledge claims involved in spatial planning practices, and the significance of awareness of their diversity.

Knowledge about landscapes may range from diverse experienced-based views of values to highly technical expert-based assessments. Thus, there is a transdisciplinary challenge in efforts to understand landscapes as a whole and capture the interrelation of different types of knowledge. Knowledge about landscapes is highly complex and it is important to clarify how that complexity is reflected (or not) in the knowledge claims that feed into a particular planning process. No matter how broad the search for knowledge to construct a suitable platform for planning, there are always limits to its assemblage.

Different methods for describing landscapes involve specific sorts of reduction, with exclusion of some types of knowledge claims, clarification of some types, and prioritisation of others. Hence, the method(s) chosen to assess landscapes will determine the types of knowledge that are presented and used as foundations for planning decisions. Therefore, the relevance of a landscape assessment approach depends on the decisions to be made, the kinds of effects the decisions will have on landscapes (Simensen et al., 2018), and the types of knowledge that are considered. Thus, it is highly important to consider the types of knowledge available and their pertinence.

For this, the classification of knowledge claims within planning by Rydin (2007) are useful for assisting understanding of the different kinds of knowledge that planners deal with. As she also notes, there is a clear need for knowledge of social, economic and environmental states and processes for robust formulation of actions that will promote transitions from current states to preferred outcome states. Since this is the general aim of planning, planners require understanding of effects of specific strategies and planning measures, together with knowledge of possible realities and futures (Rydin, 2007). Predicting landscape changes in scenarios with specified conditions is important for assessing both risks and opportunities associated with planned developments. Thus, discussion of the relevance of landscape assessment approaches for certain spatial planning processes should cover how knowledge of current state and processes of landscape change is produced, goals for preferred outcome states are formulated, and developmental strategies are established. Given the complexities involved, forums for examining the models and methods underpinning assessments are important for the transparency of knowledge production, and hence subsequent planning decisions.

It is also important to avoid the process of knowledge formation about landscapes being treated solely as a scientific rather than an ethical endeavour. Ethical and moral dimensions of landscape perspectives should be acknowleged and fully incorporated in discussions about landscape assessment methods in spatial planning. This is crucial for addressing important ethical issues in the process of forming knowledge about landscapes, such as the 'right' and 'wrong' relations to intrinsic values of nature generally, and the uses and management of specific landscapes. Moreover, diverging and possibly conflicting perspectives should be clarified in order to maximise transparency in spatial planning decisions. Spatial planners require knowledge that will help them to think about 'the how and why of particular interventions' (Healey, 2007), and thus have clear needs to understand the character (in multiple dimensions) of reasoning that is available about a landscape.

Disclosure statement

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Notes on contributor

Sofia Löfgren is a landscape architect specialised in landscape analyses and landscape architecture in Swedish urban and transport planning. In parallel with her consultancy she is engaged in research and teaching at Luleå University of Technology. She teaches environmental assessment and urban planning. Her research focuses on landscape consideration in transport planning and knowledge integration in planning practice.

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