



Local levers for change: Mainstreaming ecosystem-based adaptation into municipal planning to foster sustainability transitions



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ABSTRACT

Unprecedented global challenges demand wide-reaching societal modification to ensure life support functions and human well-being. In the absence of adequate international responses to climate change and the need for place-based adaptation, local governments have a pivotal role in fostering sustainability transitions. In this context, the importance of ecosystem-based adaptation is increasingly recognized as a multi-benefit approach that utilizes ecosystem services to harmonize human–environment systems. Although research advocates the mainstreaming of ecosystem-based adaptation to advance sustainable planning, the pathways for its systematic implementation are missing and it remains unclear how local authorities can best integrate this new approach into their core work. The purpose of this study is to increase knowledge of the potential ways to mainstream ecosystem-based adaptation into municipal planning. We investigate four coastal municipalities in southern Sweden (Malmö, Helsingborg, Lomma and Kristianstad) and examine, based on vertical and horizontal integration processes, the key characteristics of existing mainstreaming strategies. Results show that, although ecosystem service planning and climate change adaptation planning together establish the conceptual foundation for ecosystem-based adaptation, related activities are often implemented separately and are rarely comprehensive. We illustrate how combined mainstreaming strategies can reinforce and complement each other and how strong leadership in the integration of processes has the ability to compensate for a lack of guidance or supporting legislation from higher decision-making levels. Finally, we conclude that systemic mainstreaming of sustainability issues is a promising avenue for initiating and promoting sustainability transitions and has the potential to address the criticism that other mainstreaming topics have faced. On this basis, we specify the core characteristics necessary to ensure its effective and meaningful application.

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1. Introduction

Humanity faces unprecedented global challenges that demand a fundamental transformation of society in order to combat the degradation of functions that support life and ensure human development (Kates and Parris, 2003; Rockström et al., 2009). While sustainability challenges such as climate change or loss of

biodiversity are accumulating on a global level, they are characterized by multiple scales and facets and their causes and impacts relate to regional and local dynamics (Jerneck et al., 2011; Lüdeke et al., 2004). Accordingly, the discourse on climate change now emphasizes, in addition to the mitigation of greenhouse gas emissions, adaptation to adverse effects in order to comprehensively address the global challenge and support a transition towards sustainability (Crane and Landis, 2010; IPCC, 2014a; McCormick et al., 2013; Pielke et al., 2007).

In the absence of adequate responses to climate change at national and international levels, the regional and local setting is increasingly considered as an effective fulcrum to address the underlying processes of this sustainability challenge (McCormick et al., 2013; Roberts, 2008; Wiek et al., 2012; Zborel et al., 2012). Specifically, local governments have a pivotal role in guiding

Abbreviations: ES, ecosystem services; CCA, climate change adaptation; Eba, ecosystem-based adaptation.

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comprehensive responses to climate change (Rauken et al., 2014; Roberts, 2008; Roberts et al., 2011) and “acting . . . to incorporate climate change adaptation into their development plans and policies and infrastructure investments” (IPCC, 2014b, p. 6). In this context, spatial planning is a key avenue for adaptation (McDonald, 2011; Measham et al., 2011) and draws attention to respective governance arrangements (Agrawal, 2008).

Ecosystem-based adaptation, that is, the “use of biodiversity and ecosystem services as part of an overall adaptation strategy” (CBD, 2009, p. 41), is increasingly recognized as a comprehensive approach to reducing the adverse effects of climate change. It offers multiple benefits while being tailored to place-based characteristics (Chong, 2014; Roberts et al., 2011). Such benefits include greenhouse gas mitigation, livelihood protection and improvement, creation and conservation of recreation areas, support for biodiversity, improving human well-being, as well as the potential to be more cost efficient than alternative adaptation approaches (Doswald et al., 2014; Georgescu et al., 2014; IPCC, 2012; Smith et al., 2013; Uy and Shaw, 2012a). Ecosystem-based adaptation is increasingly considered to be an effective way to reassess the prevailing paradigm of dealing with risk and natural disasters which, for decades, has been dominated by technical solutions and grey infrastructure (Jones et al., 2012a; Sovacool, 2011). Although the concept is still in its infancy (e.g. Doswald et al., 2014), systematic integration of ecosystem services into municipal planning addresses the inherent linkages between nature and human well-being and, ultimately, has the potential to harmonize human-environment systems and foster sustainability transitions (Andersson, 2006; Chong, 2014; Huq et al., n.d.; IPCC, 2014a; Roberts et al., 2011; Wilkinson et al., 2013; Wu, 2014).

Research on the conceptual foundation of ecosystem-based adaptation advocates mainstreaming of both ecosystem services and climate change adaptation to foster sustainable planning and comprehensively address the impacts of climatic extremes and variability (Cowling et al., 2008; Daily et al., 2011; Kok and de Coninck, 2007; Preston et al., 2010; Vignola et al., 2009). Although the term mainstreaming often has no clear definition, it relates to the “deliberate perturbation in the natural order of things” and undermines the status quo to radically expand and enhance the topic under consideration (La Trobe and Davis, 2005; Picciotto, 2002, p. 323). However, pathways for systematic integration and institutionalization are largely missing (Vignola et al., 2009; Andrade et al., 2011), and it thus remains unclear how local authorities can best integrate this new approach into municipal planning.

Against this background, the purpose of this study is to increase knowledge about the potential ways of mainstreaming ecosystem-based adaptation into municipal planning to foster sustainability transitions. On the basis of in-depth studies of four municipalities in southern Sweden, we examine how ecosystem-based adaptation planning is integrated into municipal planning practice and assess the key characteristics of mainstreaming strategies and their ability to foster sustainability transition.

2. Conceptual framework

Ecosystem-based adaptation is a relatively new concept which aims to systematically harness the services of ecosystems to buffer communities against extreme events and thus facilitate adaptation to the adverse effects of climate change (Foster et al., 2011; Gaffin et al., 2012; Gill et al., 2007; Jones et al., 2012a; Munang et al., 2013). Accordingly, the concept is embedded in theories and research regarding both ecosystem services and climate change adaptation (Chong, 2014; Uy and Shaw, 2012a, 2012b). Ecosystem services are, on the one hand, “the conditions and processes through which natural ecosystems, and the species that make

them up, sustain and fulfill human life” (Daily, 1997, p. 41). They include, but are not limited to, natural processes that regulate local climate, erosion, soil retention, water and air quality, and natural hazards (De Guenni et al., 2005; Larondelle et al., 2014). Developed to integrate ecological principles into economic considerations and decision-making (De Groot, 1987; TEEB, 2010), the ecosystem services concept is considered as an effective way to advance sustainable urban planning at local government level (Ahern et al., 2014). On this basis, ecosystem service planning refers to a place-based approach that focuses on the creation, restoration and conservation of ecological structures to provide society with specific services from nature (Chan et al., 2006; Staes et al., 2010). Climate change adaptation focuses, on the other hand, on the modification of human-environment features to moderate adverse effects of climate extremes and variability or exploit concomitant benefits (IPCC, 2007; Janssen et al., 2006; Thompson et al., 2006; Wamsler et al., 2013). Consequently, climate change adaptation planning assesses and modifies contemporary and planned activities, policies and the built environment according to the current and projected impacts of climate change and related societal vulnerabilities (Dannevig et al., 2012; Füssel, 2007; Smit et al., 2000; Wamsler, 2014).

The generation of simply more knowledge on climate change is insufficient to achieve sustainable adaptation planning; rather, solution-oriented approaches are urgently needed (Miller et al., 2013; Wiek et al., 2012). Research efforts are increasingly focused on the conceptualization of multi-dimensional and radical change to achieve goal-oriented system-wide alterations that foster sustainability. Related literature is found under the topics of sustainability transitions (e.g. Forrest and Wiek, 2014; Markard et al., 2012; Van den Bergh et al., 2011) and sustainable transformation (IPCC, 2012; McCormick et al., 2013; Westley et al., 2011), and several research approaches have been developed (Forrest and Wiek, 2014; Geels and Schot, 2007; Markard et al., 2012; Rotmans and Loorbach, 2009; Sarewitz et al., 2012; Van den Bergh et al., 2011). Nevertheless, there is a lack of knowledge about the dynamics at play in “real-life experimental governance processes”, how transitions unfold and “the specifics by which such processes contribute to change for sustainable development” (Bos and Brown, 2012, p. 1341).

The question of how to support the implementation of ecosystem-based adaptation and overcome barriers in local governmental bodies is investigated in the fields of ecosystem services (e.g. Daily and Matson, 2008; Daily et al., 2009) and climate change adaptation (e.g. Clar et al., 2013; Moser and Ekstrom, 2010) and has been addressed by several sets of guidelines (e.g. Andrade et al., 2011; Naumann et al., 2011; Roberts and O'Donoghue, 2013; Travers et al., 2012; Vignola et al., 2013, 2009; WWF, 2013). Further efforts have been undertaken to compile guidelines and checklists and translate general principles into consecutive steps (e.g. Dalal-Clayton and Bass, 2009; Travers et al., 2012). What is however missing is a systematic identification and characterization of particular strategies that have the potential to support comprehensive mainstreaming of sustainability issues into governments (Runhaar et al., 2014; Westley et al., 2011).

The motivation for mainstreaming originates from the need to change the dominant paradigm. Accordingly, mainstreaming is framed as incorporating new aspects into existing core work and it has been used for cross-cutting issues such as gender (e.g. Mazey, 2002), environment (e.g. Dalal-Clayton and Bass, 2009; Jordan and Lenschow, 2010), risk reduction (Benson et al., 2007; La Trobe and Davis, 2005; Wamsler, 2014), HIV/AIDS (e.g. Holden, 2004), education and learning (e.g. Ferreira et al., 2007) and climate change adaptation (e.g. Adelle and Russel, 2013; Wamsler, 2014). Ultimately, mainstreaming processes will change the rules of the game and challenge ideas, attitudes, or activities that are

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