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Unpacking multilevel adaptation to climate change in the Great Barrier Reef, Australia

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ABSTRACT

Multilevel governance is regarded as a promising approach to deal with the multidimensional nature of climate change adaptation. However, the policy context in which it is implemented is very often complex and fragmented, characterised by interacting climate and non-climate strategies. An understanding of multilevel decision-making and governance is particularly important, if desired adaptation outcomes are to be achieved. This paper examines how climate change adaptation takes place in a complex multilevel system of governance, in the context of Australia's Great Barrier Reef (GBR) region. It examines over one hundred adaptation strategies at federal, state, regional and local levels in terms of type, manifestation, purposefulness, drivers and triggers, and geographic and temporal scope. Interactions between strategies are investigated both at the same level of governance and across governance levels. This study demonstrates that multilevel approach is a necessary, but not a sufficient condition in responding to complex multiscale and multisector issues, such as climate change adaptation. Short-term adaptation measures; a predominant incremental, sectoral, top-down approach to adaptation; and the lack of a framework for managing interactions are major threats to effective climate adaptation in the GBR region. Coping with such threats will require long-term transformative action, establishing enabling conditions to support local adaptation, and, most important, creating and maintaining strategic interactions among adaptation strategies. Coordinating and integrating climate and non-climate strategies across jurisdictions and policy sectors are the most significant and challenging tasks for multilevel governance in the GBR region and elsewhere.

1. Introduction

Climate change adaptation strategies have recently proliferated in developed nations as an important approach in response to climate change (Bauer et al., 2011; Biesbroek et al., 2010; Preston et al., 2011; Tompkins et al., 2010); with adaptation measures emerging at different levels of governance (e.g., Juhola and Westerhoff, 2011; Keskitalo, 2010a; Termeer et al., 2011; Urwin and Jordan, 2008; Westerhoff et al., 2011). In Australia, for example, "adapting to unavoidable climate change" comprises one of the pillars underpinning the National government's climate change strategy (Australian Government, 2010a); and all levels of government (national, state and local) have developed initiatives to build the country's capacity to adapt to the impacts of climate change (Australian Government, 2010b).

Multilevel governance – decision- and policy-making that involve multiple actors and take place across multiple jurisdictions and sectors – is critical for adaptation (Termeer et al., 2010). The multidimensional nature of climate change requires responses at multiple geographical and jurisdictional scales, levels of social and administrative organisation, and policy and resource sectors (Keskitalo, 2010a; Termeer et al., 2011). In other words, causes and effects of climate change manifest at multiple scales (from local to global), and need to be addressed accordingly (Termeer et al., 2010). In general, distributing governance across multiple jurisdictions is regarded to be both more efficient and superior to monocentric governance. This is because polycentric systems are regarded as more capable to anticipate and create space for adaptation and learning (Ostrom, 2010; Termeer et al., 2011, 2010).

Multilevel governance, despite comprising a promising approach to cope with multiscale and multisector issues, faces

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significant challenges in a climate adaptation context. One such challenge refers to the policy context in which it is implemented, which is very often complex and fragmented, and is characterised by a diversity of interacting climate and non-climate strategies (e.g., programs, plans, policies and legislation) (Termeer et al., 2011). Interaction between and among those strategies can create both synergetic and conflicting outcomes (Adger et al., 2006; Urwin and Jordan, 2008; Young, 2002). Coping with complexity and fragmentation requires a great deal of coordination and integration to ensure that adaptation is enabled and effective rather than constrained or maladaptive (Adger et al., 2005; Juhola and Westerhoff, 2011; Keskitalo, 2010a; Termeer et al., 2011). Therefore, understanding adaptation requires attention to cross-scale and multilevel processes. Despite recent constructive efforts (e.g., Juhola and Westerhoff, 2011; Keskitalo, 2010a; Termeer et al., 2011; Urwin and Jordan, 2008; Westerhoff et al., 2011), multilevel adaptation is still under-researched. Adaptation research has focused on a single level of governance (particularly, the national level) and has paid limited attention to cross-level interactions (Bulkeley and Betsill, 2005). Much needed is an understanding of decision-making and governance frameworks at multiple levels (Keskitalo, 2010b). In addition, despite the growing interest in assessment approaches and adaptation options, studies that systematically examine strategies at the subnational levels are still scarce (Ford et al., 2011).

This paper examines how climate change adaptation takes place in a complex multilevel governance system comprised by Australia's Great Barrier Reef region. It maps adaptation strategies (what are the existing adaptation policies and strategies?) and responsibilities (who has been developing/adopting such strategies?) at federal, state, regional and local levels. It examines over 100 examples of adaptation strategies in terms of type of adaptation, its manifestation, purposefulness, drivers and triggers, and geographic and temporal scope. Interactions between strategies (how adaptation strategies relate to each other) are investigated both at the same level of governance (horizontally) and across governance levels (vertically). This paper may prove useful not only to the understanding of climate change adaptation but also of social-ecological systems in general, as these systems are inherently cross-scale, and factors located at multiple levels are determinant in achieving desired management outcomes (Adger et al., 2006; Lebel et al., 2006).

2. Climate change adaptation and multilevel governance

Adaptation is an important societal response to climate change and can significantly reduce its adverse impacts. Smit and Wandel (2006) outline a number of types of adaptation and these are defined by their timing (anticipatory, concurrent, reactive), intent (autonomous, planned), spatial scope (local, widespread), form (technological, behavioural, financial, institutional, informational), and degree of necessary change (small adjustments to transformations). In this paper we consider planned and anticipatory adaptation in terms of "...the decision-making process and the set of actions undertaken to maintain the capacity to deal with future change or perturbations to a social–ecological system without undergoing significant changes in function, structural identity, or feedbacks of that system while maintaining the option to develop" (Nelson et al., 2007). Adaptation to climate change occurs in a context of interacting non-climatic changes; it aims to meet a broad range of social and economic goals (Adger et al., 2005; Moser and Ekstrom, 2010; Tompkins et al., 2010). In other words, adaptation takes place through policy and planning development which are not only specifically focused on climate goals and priorities but also on non-climate ones (e.g. conservation, urban planning and emergency management) that may support adaptation to climate change (Dovers, 2009; Smit and Wandel, 2006). It is important to notice that the ability to differentiate between coping and adaptation is challenged in the diversity of real world situations, yet the conceptual differences are significant for the present analysis. Coping strategies are generally described as reactive, with the intent to maintain the status quo (Davies, 1993; Eriksen et al., 2005). Adaptation, on the other hand, is presented as forward looking, in which activities are intended not to maintain status quo, but to reduce sensitivity to disturbances and increase the ability to respond to change (Adger et al., 2007).

Institutions, governance and management play a critical role in determining a system's ability to adapt (Agrawal, 2008; Eaking and Lemos, 2006; Engle, 2011; Engle and Lemos, 2010; Gupta et al., 2010; Lebel et al., 2006). As highlighted previously, because the impacts and effects of climate change span multiple scales, adaptation strategies need to be developed in a range of policy sectors and levels of governance (Termeer et al., 2011). This complexity and the constraints within which institutions operate contribute to the blurring of the distinction between coping and adaptation. Can short-term policy interventions be considered adaptations? This is a critical question not only in the GBR, but in other contexts as well. Multilevel governance may create multiple benefits by enhancing innovation, learning, adaptation, levels of cooperation and the achievement of more effective, equitable and sustainable outcomes (Ostrom, 2010). On the other hand, complex governance arrangements can be regarded as undesirable in terms of bureaucracy, administrative burdens, fragmentation and conflicts over competencies and the division of roles and high transaction costs (Termeer et al., 2011); complex governance arrangements may also result in a confusing and disabling environment (Bohensky et al., 2010).

In this context, the notion of interplay (i.e., interactions or linkages) is key to understanding multilevel governance, and the challenges and opportunities for adaptation in complex governance systems, such as the Great Barrier Reef. Institutional interplay conceptual frameworks have been developed in the context of international relations, and have usually been used to analyse interactions between international institutions (e.g., Gehring and Oberthur, 2008; Oberthur, 2009; Oberthur and Stokke, 2011; Stokke, 2001). In this paper, interplay is conceptualised in a somewhat distinct way, namely in terms of national and subnational institutions. There are several categories for the classification of institutional interplay (see e.g., Gehring and Oberthur, 2008). The classes of interplay discussed by Young (2002, 2005) offer the basis for this inquiry. Interplay between or among institutions may occur both vertically and horizontally (Young, 2002, 2005). Horizontal interactions occur at the same level of social organisation (e.g., many sectoral policies incorporate a climate change dimension to their core business); whereas vertical interplay concerns the interactions linking adaptation strategies located at different levels of social and administrative organisation (e.g., between state and national levels). Interplay can also be thought in terms of functional interactions, when substantive problems addressed by two or more strategies are linked in biogeophysical or socioeconomic terms. In this case, the operation of one strategy directly influences the effectiveness of another (Adger et al., 2005; Young, 2002, 2006). Interplay also features political linkages when actors create links between strategies in order to advance individual or collective goals (Young, 2002, 2005). The primary focus of this study is on the interplay occurring at national and sub-national levels of formal governance, and local-regional resource management. Such a focus on government strategies does not imply that governments are the sole responsible for decision-making. Community, environmental and industry groups are integral parts of the GBR governance. In fact, some of the strategies examined in this paper comprise