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Fit-for-purpose governance: A framework to make adaptive governance operational

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ABSTRACT

Natural disasters, extreme weather events, economic crises, political change and long term change, such as climate change and demographic change, are in many places forcing a re-think about the way governments manage their environmental resource systems. Over the last decade, the concept of adaptive governance has rapidly gained prominence in the scientific community as a new alternative to the traditional predict-and-control regime. However, many policy makers and practitioners are struggling to apply adaptive governance in practice. Drawing on an extensive, critical literature review of adaptive governance, network management and institutional analysis, we argue that the constraints to the uptake of adaptive governance relate to a large extent to the inability of practitioners and policy makers to cope with complexity and various uncertainties: (i) ambiguous purposes and objectives of what should be achieved with governance; (ii) unclear contextual conditions in which governance takes place; and, (iii) uncertainty around the effectiveness of different governance strategies. To address such practical challenges, this paper introduces a “fit-for-purpose” framework consisting of three key ingredients for developing a diagnostic approach for making adaptive governance operational. We introduce the concept of fit-for-purpose governance to be used as an indication of the effectiveness of governance structures and processes and define it as a measure of the adequacy of the functional purposes that governance structures and processes have to fulfil at a certain point in time. In other words, are existing and proposed governance structures and processes fit for their purpose? While adaptive governance focuses on responding to (potential) change, fit-for-purpose governance is specifically considering the (future) functions that the social and physical components of a particular system, such as an urban water system, have to fulfil. As such, the fit-for-purpose governance framework provides an alternative starting point for developing the much sought-after guidance for policy and decision makers to evaluate the effectiveness of established governance arrangements and to predict the likelihood of success of institutional reform.

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1. Impediments to the implementation of adaptive governance

Natural disasters, extreme weather events, economic crises, political change and long term change, such as climate change and demographic change, are in many places forcing a re-think about the way governments manage their environmental resource management systems. For example, adaptation to climate change is commonly referred to as a governance issue (e.g. Adger et al., 2009, 2005; Folke, 2006). Developing resilient governance systems to manage environmental assets to support secure, long-term societal development is challenging (Costanza et al., 2000; Lambin, 2005). Research has demonstrated that this challenge requires adaptive forms of governance that explicitly take in to account immediate and long term change (Dietz et al., 2003; Folke et al., 2005). However, the complexity of system dynamics and interactions between different components of governance systems causes inherent uncertainty in terms of short, medium and long term outcomes. Therefore, adaptive governance attempts to address uncertainty through continuous learning, involvement of multiple actors in decision making processes and self-organisation of the governance system.

Continuous learning is a critical component of adaptive governance in order to be able to take into account complex dynamics and uncertainty (e.g. Folke et al., 2005). Learning processes are stimulated by networks that enable interaction between individuals, organisations, agencies and institutions at multiple organisational levels to draw upon various knowledge systems and the experience to develop policies (e.g. Adger, 2001; Adger et al., 2005; Olsson et al., 2006). Adaptive governance relies on polycentric institutional arrangements that operate at multiple scales (McGinnis, 1999; Ostrom, 1996), and balance between centralised and decentralised control (Imperial, 1999). Furthermore, adaptive governance systems often self-organise as a result of learning and interaction (e.g. Folke, 2003). However, self-organisation needs to be enabled by flexible institutional arrangements that encourage reflection, innovative responses, and some redundancy (Brunner et al., 2005; Folke et al., 2005; Pahl-Wostl, 2006). Leadership of individuals or organisations may serve as a catalyst for emergent adaptive processes by strategically bringing together people, resources and knowledge (e.g. Boal and Schultz, 2007; Lichtenstein and Plowman, 2009; Uhl-Bien et al., 2007).

The technologies and knowledge required to develop adaptive environmental resource management systems are in most cases available, but their implementation into practical action remains slow (Harding, 2006; Mitchell, 2006). Numerous scholars have identified a range of impediments, many of them related to governance (e.g. Brown and Farrelly, 2009; Maksimovic and Tejada-Guilbert, 2001). For example, Australian urban water practitioners who have tacit knowledge of the operation of traditional systems are insufficiently engaged in policy making to incorporate practical knowledge about opportunities and impediments for more sustainable water management (Brown et al., 2009). Furthermore, recent research demonstrates practitioners are willing to embrace new practices but are currently constrained by, among other

things, traditional servicing arrangements, limited capacity (skills and knowledge of new technologies/systems/practices) and concerns regarding the potential risks to public health and welfare (Brown et al., 2009; Farrelly and Brown, 2011).

This paper aims to assist in overcoming the challenges of making adaptive governance operational by providing a tentative framework for policy practitioners and decision makers for assessing the effectiveness of governance approaches. This “fit-for-purpose” governance framework provides the ingredients for assessing the effectiveness of existing and proposed governance mechanisms to fulfil their purpose in a particular context. The framework was developed after an in-depth review of the underlying reasons that cause challenges in practice in the institutional science and (adaptive) governance literatures related to environmental resource management (Section 2). This revealed that constraints to the uptake of adaptive governance relate, to a large extent, to the inability of practitioners and policy makers to cope with complexity and uncertainties. Several efforts have been made to develop principles for effective governance of social-ecological systems (e.g. Huntjens et al., 2012; Ostrom and Cox, 2010). However, in practice a tendency to implement panaceas for the governance of social-ecological systems has been observed in the past (Ostrom et al., 2007). Using the literature on policy analysis related to social-ecological systems, the fit-for-purpose framework is developed as a diagnostic procedure that can guide policy practitioners through a logical process, while the framework itself reflecting contemporary and adaptive understandings of governance. Drawing upon literature bodies related to networks, leadership and social learning, a first attempt is made to make the fit-for-purpose framework operational (Section 4). Furthermore, the potential applications and limitations of the fit-for-purpose governance framework are discussed (Section 5).

2. Three uncertain aspects that create challenges for adaptive governance

Drawing on insights gained from an extensive, critical literature review on adaptive governance, network management and institutional analysis, we argue that constraints to the uptake of adaptive governance relate, to a large extent, to the inability of practitioners and policy makers to cope with complexity and uncertainties. In particular: (i) ambiguous purposes and objectives of what should be achieved with governance; (ii) unclear contextual conditions in which governance takes place; and (iii) uncertainty around the effectiveness of different governance strategies.

2.1. Ambiguous purposes of governance

According to many scholars, there is a shift taking place from government to governance; a shift from hierarchical and well-institutionalised forms of governance performed by a dominant bureaucratic and administrative government, to less formalised governance approaches with power distributed amongst various actors and organisations (e.g. Arts et al., 2006; Hanf and Scharpf, 1978; Ostrom, 1990). Governance is a concept that is defined and interpreted in many different ways

(for an overview of definitions and interpretations, see e.g. Kjær, 2004; Rhodes, 1996). It refers to both processes and structures for steering and managing parts of societies (Kooiman, 1993; Pierre and Peters, 2000; see also van Nieuwaal et al., 2009). Governance as process refers to managing networks, markets, hierarchies or communities (Kjær, 2004; Rhodes, 1996). In this sense, governance refers to governing and can be defined as “the setting, application, and enforcement of the rules of the game” (Kjær, 2004, p. 12), or as “all those activities of social, political and administrative actors that can be seen as purposeful efforts to guide, steer, control or manage (sectors or facets of) societies” (Kooiman, 1993, p. 2). Governance as structure refers to the pattern of institutional design and the mechanisms in which social order is generated and reproduced (Voß, 2007). In this respect, governance is defined as “the patterns that emerge from governing activities of social, political and administrative actors” (Kooiman, 1993, p. 2). Here, we take into account both interpretations of governance and consider it as the total of: the networks of actors, institutional frameworks and processes that take place within these networks and frameworks.

Identifying the purpose of governance is not straightforward (see also Adger et al., 2009; Smith et al., 2005). For example, the official objective of the 2.3 billion Euro flood protection program Room for the River in the Netherlands was set by the Dutch Government in December 2006 to increase the discharge capacity of the river systems to 16,000 m³/s by 2015, whilst contributing to spatial quality of the river landscape (www.roomfortheriver.nl). The ambiguity arises from the second part of the objective, because different stakeholders may have different ideas about “contributing to spatial quality”. For example, certain stakeholders may prefer new opportunities for development, whilst others pursue the creation of nature and/or recreation areas. According to Adger et al. (2009, p. 339), such diversity of values may often lead to “a paralysis of adaptation actions”. Furthermore, the ambiguity of governance purposes raises questions such as “who governs?” and “whose sustainability gets prioritised?” (Smith and Stirling, 2010). Hence, it can be concluded that ambiguous governance purposes resulting from a range of values creates a significant challenge for applying adaptive governance.

2.2. Unclear governance context

Social–ecological systems can be described as complex adaptive systems that evolve through interaction between social and natural sub-systems (see also Berkes et al., 2000; Folke, 2006). Interactions between the physical components of the social–ecological system, the governance system and the users of, for example, the urban water system, result in outcomes that evolve in time and space (Ostrom, 2007). Hence, changing conditions in the social and physical context of social–ecological systems influences the effectiveness of governance to serve a specific purpose. Governance, and adaptive governance in particular, relies on networks that connect actors (individuals, organisations, agencies, and/or institutions) at multiple organisational levels (Folke et al., 2005). The effectiveness of networks to solve complex problems, such as adaptive governance of environmental

resource systems, depends on the combination of network structure and context (Turrini et al., 2010). Research undertaken in the computer sciences has shown that the concept of context is generally understood by a set of circumstances that frame an event or object, but it remains ill-defined in the cognitive and related sciences (Bazire and Brézillon, 2005). Several frameworks from the literatures about institutional analysis (e.g. Kiser and Ostrom, 1982; McGinnis, 2011), transition management (e.g. Geels, 2002; Rotmans et al., 2001) and adaptive governance (e.g. Pahl-Wostl, 2007) provide key components for mapping the context, such as rules, dominant paradigms, available technology and knowledge and biophysical conditions. However, as Ostrom (2011) comments, a framework merely identifies elements and general relationships that need to be considered for institutional analysis. It does not provide analysts nor practitioners specific methods for how a context can be mapped in order for it to establish effective governance strategies. This reveals the need for further work to operationalise adaptive governance in the future in order to be able to better predict the likelihood of success of adaptation measures.

2.3. Uncertain governance outcomes

As mentioned above, governance relies on networks that connect actors at multiple organisational levels. Thus, analysing relations between actors helps to understand how social structures (the regime) enhance or hinder effective governance. Turrini et al. (2010) suggest that the effectiveness of networks to solve “wicked” problems such as adaptation to climate change depends on a combination of network structure and context. However, Ostrom et al. (2007) argue that practitioners and scholars have a tendency towards developing panacea, blueprint solutions, to all types of environmental problems and fail to take uncertainty and the complex dynamics of governance systems into account. For example, the privatisation of public services or decentralised management of natural resources have a track record of repeated failure related to unanticipated outcomes (Acheson, 2006). Therefore, it is not surprising that in many developed countries a paradigm shift is currently taking place in water governance from “a prediction and control to a management as learning approach” (Pahl-Wostl, 2007, p. 49). Prediction and control approaches are derived from mechanistic thinking in which system behaviour and response can be predicted and optimal control strategies can be designed within regulatory frameworks that are shaped by technical norms and legal prescriptions (Pahl-Wostl, 2007). Management as learning approaches are essentially adaptive approaches derived from complexity and resilience thinking in which self-organisation and learning have a central place (Pahl-Wostl, 2007). Such learning approaches embrace uncertainty by iterative processes of adjusting governance to achieve better outcomes over time. However, policy makers and practitioners continue to struggle with setting learning goals and expectations, defining adequate learning mechanisms, and identifying who should be involved in learning processes (Armitage et al., 2008). This hampers their ability to develop adaptive governance strategies which rely on continuous learning.

3. Proposal for a framework to overcome challenges for adaptive governance

Adaptive governance offers an important theoretical framework for developing more sustainable governance of environmental resources, but needs to be supported by tools for operationalisation. In engineering, examples of supporting tools to help put adaptation in practice such as the “adaptation tipping point” method (Kwadijk et al., 2010) or “real options” analysis (Gersonius et al., 2010) are readily available. However, supporting tools are still required to shift adaptive governance from rhetoric to practice. Water management and climate adaptation practice and policy making in, for example, Australia (Nelson et al., 2008) and the Netherlands (Anema and Rijke, 2011) are facing difficulties in putting the principles of adaptive governance into practice. In particular embracing complexity and uncertainty, continuous learning, and ongoing reflection and adjustment of management approaches, are providing practical challenges because they are not being institutionalised into planning practice. According to practitioners and policy makers, adaptive approaches should preferably be incorporated into existing institutional frameworks in order to achieve such a shift (Rijke et al., 2009). However, most existing institutional frameworks are based on the predict and control paradigm and act as the institutional expression of reducing uncertainty (see also Pahl-Wostl, 2007). As such, they are designed to provide “optimal” solutions to environmental resource problems. Inherent uncertainty of climate behaviour (Milly et al., 2008), alongside the uncertainties of adaptive governance that are described above, make development of such solutions practically impossible. Hence, there is a mismatch between the existing institutional frameworks in which policy makers and practitioners operate and the principles of adaptive governance, such as flexibility and self-organisation (see also Nelson et al., 2007).

To address the challenges to operationalise adaptive governance, we propose a complementary framework that uses dominant institutional arrangements rather than flexibility and self-organisation as the starting point. However, rather than aiming for good or even “optimal” governance, it aims for “good enough governance”, which takes into account uncertainty by focusing on essential adjustments, priorities in the short and long term and feasibility, and therefore may be a more realistic goal (Grindle, 2004; p.526). In order to operationalise the concept of adaptive governance and avoid the pitfalls of panacea (Section 2.3), we propose a framework that provides the ingredients for assessing the effectiveness of existing and proposed governance mechanisms to fulfil their purpose in a particular context. In other words, are existing and proposed governance mechanisms (governance structures and processes) fit for their purpose? Applying such a diagnostic approach provides insight about how particular solutions improve or aggravate outcomes and assists in avoiding developing inadequate governance solutions (Ostrom, 2007; Pahl-Wostl et al., 2010). Assessment of the impact of particular solutions requires knowledge about the purpose for which these solutions are implemented and the context in which they are implemented. As such, the fit-for-purpose framework provides guidance for establishing fit-for-purpose governance.

We define fit-for-purpose governance as a measure of the adequacy of the functional purposes that governance structures and processes have to fulfil at a certain point in time. A fit-for-purpose governance structure (e.g. a hierarchy or a free market) enables social, political and administrative actors to purposefully guide, steer, control or manage (sectors or facets of) societies through network structures that have a fit to their physical and social context (adapted from Kooiman, 1993). Fit-for-purpose governance processes (e.g. leadership or social learning) are fit to both the network structure in which they take place and the purpose for which they are being used. While adaptive governance focuses on responding to (potential) change, fit-for-purpose governance is specifically considering the (future) functions that the social and physical components of a particular social–ecological system have to fulfil. In other words, adaptive governance is about ongoing action while fit-for-purpose governance is an indication of the effectiveness of such action. Therefore, the two concepts are complementary and using them concurrently creates synergies: the concept of fit-for-purpose governance may provide the much sought-after guidance for policy makers and decision makers to predict the likelihood of success of institutional reform by diagnosing the fit of governance arrangements with the purpose for which they are being proposed or applied. Subsequently, learning processes characteristic to adaptive governance could use the results of such diagnosis to evaluate the effectiveness of governance in relation to any immediate crises and/or long-term change.

In Fig. 1, a three-step framework to diagnose the fit-for-purpose of governance mechanisms is presented. By making the three uncertain aspects that create challenges for the operationalisation of adaptive governance explicit, the framework aims to make policy makers and decision makers aware of issues that need to be resolved in order to develop effective (adaptive) governance mechanisms. As such, the fit-for-purpose framework identifies ingredients from which a tool for establishing adaptive governance can be developed. First, the purpose of implemented or proposed governance mechanisms needs to be identified in terms of policy objectives (e.g. expressed by temporal and spatial dimensions and/or production, consumption flow of resources). Secondly, the context in which governance strategies are implemented needs to be mapped. Despite the lack of available tools to map a particular context, frameworks are developed that provide a starting point for doing so (see Section 2.2). For example, a governance system can be considered as a subsystem of a social–ecological system that interacts with: (1) resource systems (e.g. sewage systems, rivers) in which resource units (e.g. wastewater, fish) are produced, consumed or transported; (2) related ecosystems; and (3) social, economic and political settings (Ostrom, 2007). Hence, it could be argued that a context consists of relating resource systems, ecosystems and social, economic and political settings. Thirdly, the expected outcomes of the governance mechanisms and their fit with the original purpose are evaluated. For example, centralised governance structures are in general known to be effective for coordination of actions. Hence, they may have a high degree of fit for the purpose of immediate decision making during crisis situations.

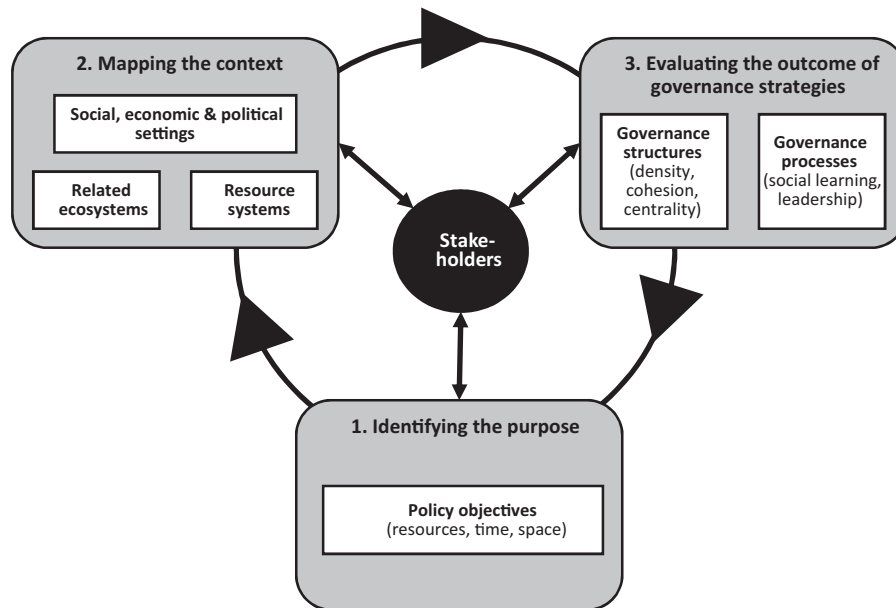


Fig. 1 – Three critical steps for diagnosing the fit-for-purpose of governance mechanisms: (1) identifying the purpose of governance, (2) mapping of the context, and (3) evaluating the outcome of governance mechanisms.

Stakeholders stand central in this model, because the outcome of the three steps depends on the mix of stakeholders within the assessment. Governance strategies arise from multi-stakeholder processes; thus, the purpose of governance mechanisms is also determined by multiple stakeholders. Their perspectives depend on their values, interests, knowledge and expectations. On the other hand, the purpose of governance strategies determines which actors have an interest and become stakeholders. By definition, stakeholders are operating in the context of governance. However, the context also shapes how stakeholders behave and interact with the physical environment. Because of the interdependencies between stakeholders and the purpose, context and fit of governance mechanisms, the fit-for-purpose governance framework requires a holistic approach that includes analysis of the purpose, context and fit from different stakeholder perspectives. Through taking a holistic perspective, the needs for new governance measures (i.e. the purpose), the legacy of existing governance mechanisms and challenges and opportunities (i.e. the context), and strengths and weaknesses of different proposed new governance mechanisms can be explored (i.e. outcomes).

Because the presented framework relies on stakeholder input, it is prone to the failures and challenges that relate to incorporation of meaningful and effective participation in environmental governance. Although, the methods and impact of participation remain under debate, it is considered that it has the potential to improve the knowledge base for decision making, strengthen public support and increase the effectiveness of governance (e.g. Newig and Fritsch, 2009; Paavola et al., 2009; Pellizzoni, 2003). Notwithstanding this, even within single assessments, there are different perspectives on the rationales for participation (e.g. Wesselink et al., 2011; Wright and Fritsch, 2011) and on the design of participation processes (Webler and Tuler, 2006; Webler et al., 2001), which could result in unfulfilled expectations

and disappointing performance (Hajer, 2005; Turnhout et al., 2010). Hence, the users of the fit-for-purpose framework should carefully design their participation and engagement strategies to ensure a meaningful and reliable assessment. The choice of stakeholders involved should be based on a balance between economic efficiency, environmental effectiveness, equity and political legitimacy (Adger et al., 2003). Furthermore, the mix of actors involved in the assessment should encompass stakeholders at the operational, institutional and constitutional levels of governance, covering different governance functions (e.g. ownership and management functions) and consider all institutional rules that regulate the use and management of environmental resources (Paavola, 2007). This makes the use of the fit-for-purpose governance framework a timely process that relies on the user's ability to gain insight into these aspects of governance prior to or during the fit-for-purpose governance assessment.

4. First steps towards operationalisation of the fit-for-purpose governance framework

As described above, the purpose and contextual conditions depend on the values, beliefs and interests of the involved stakeholders. However, a review of adaptive governance literature (including the network management, leadership and social learning literatures) suggests that in general, different structures and processes have different strengths and weaknesses and may therefore in general be preferred in particular situations. In order to better understand governance outcomes, a review of network properties (i.e. governance structures and processes) has been conducted. Three key properties that describe network structure are identified from literature: density, cohesion and centrality of networks (see Table 1). The analysis suggests that properties under a

Table 1 – Governance Structures: key properties of network structure.

| Property | Definition | Strengths | Weaknesses |
|----------------------------|--|--|---|
| Network density | The extent to which a network is interconnected. It can be calculated by the number of existing ties between network actors divided by the number of possible ties. In policy science, density is also referred to as interconnectedness See also (Bressers et al., 1994; Bressers and O'Toole Jr., 1998). | <p>A higher number of social ties enhances development of knowledge and understanding through increased exposure to information and new ideas (Granovetter, 1973).</p> <p>A higher number of social ties between actors leads to more possibilities for collective action through increased possibilities for communication and, over time, potentially increased levels of reciprocity and trust (e.g. Axelrod, 1997; Hahn et al., 2006; Olsson et al., 2004a).</p> | <p>Group effectiveness of collective action may decline at high densities (Oh et al., 2004).</p> <p>Excessively high densities can lead to homogenisation of information and knowledge which, in turn, may lead to less efficient use of resources and reduced capacity to adapt to changing conditions (Bodin and Norberg, 2005; Little and McDonald, 2007; Ruef, 2002).</p> |
| Network cohesion | The extent to which individuals, groups and organisations empathise with each others' objectives insofar as these are relevant to the policy issue (Bressers and O'Toole Jr., 1998). When there is limited cohesion, several communities can be distinguished in a network. | <p>The presence of multiple communities (lack of cohesion) may enhance the development of knowledge within communities by providing opportunities for high degrees of interaction between actors with similar interests, leading to increased capacity to transfer tacit knowledge (Reagans and McEvily, 2003), spread of attitudes and opinions (e.g. Faust et al., 2002; Padgett and Ansell, 1993; Porter et al., 2005).</p> <p>The presence of multiple communities may contribute to the development of a diversity of knowledge by enabling various forms of knowledge to be developed in different communities, leading to increased adaptive capacity (e.g. Davidson-Hunt, 2006; Page, 2008).</p> | <p>A lack of cohesion may result in limited collaboration between communities when there is a lack of ties between these communities (Granovetter, 1973).</p> <p>The presence of multiple communities may hinder transfer of tacit knowledge, because individuals have limited cognitive capacity and therefore are forced to be selective in keeping up their relationships with others (Bodin and Crona, 2009).</p> |
| Centrality -of an actor | The extent to which an actor has a central position in a network. | <p>By occupying central positions in a network, actors can influence others in networks and are better situated to access valuable information which can put them at an advantage (Burt, 1995, 2004; Degenne and Forsé, 1999)</p> <p>Adoption of innovations is generally being diffused from cores of centralised actors to more loosely connected peripheral actors (Abrahamson and Rosenkopf, 1997).</p> | <p>Actors have limited capacity to support and maintain network connections (Bodin and Crona, 2009).</p> |
| -of a network | The extent to which there is variability of centrality between the actors in a network (Wasserman and Faust, 1994). | <p>Higher network centrality increases the ability to solve simple problems structures (Bodin et al., 2006; Leavitt, 1951).</p> <p>Higher degrees of centrality are favoured for mobilisation and co-ordination of actions (Bodin et al., 2006).</p> | <p>Possibilities for action can be constrained when an actor feels obliged to please all its network neighbours (Frank and Yasumoto, 1998).</p> <p>Complex problem solving requires more decentralised network structures structures (Leavitt, 1951) (Bodin et al., 2006).</p> <p>Lower degrees of centrality may be favoured to engage a broad spectrum of stakeholders in order to resolve issues of complex governance processes in later phases (Bodin et al., 2006).</p> |

given combination of purpose and contextual conditions provide different outcomes. For example, in immediate crisis situations such as flooding, timely and well coordinated responses are needed. In such a context, centralised network structures are likely to be more effective in coordinating action than in decentralised networks, where power is more distributed in the network (Ernstson et al., 2008). Using hierarchy, debate or conflicting actions may be avoided which may enable timely evacuation so that people can be saved from undesirable outcomes such as drowning. However, centralised coordination may, for example, cause legitimacy issues (Bodin and Crona, 2009; Ernstson et al., 2008) in adaptation to long-term structural changes such as water allocation in large-scale transboundary water systems. In this scenario, networks with a lower degree of centrality and cohesion (i.e. multiple communities) and a higher density

(i.e. interconnectedness) may be more appropriate because they provide the diverse knowledge base that is needed for finding solutions to complex problems (e.g. Davidson-Hunt, 2006; Page, 2008).

In terms of governance processes, it is important to take note that complex adaptive systems evolve due to external pressure or self-organising interactions in networks. In adaptive governance literature, social learning and leadership are considered key processes on which self-organisation depends (e.g. Folke et al., 2005; Olsson et al., 2006). Therefore, we focus here on these processes rather than more traditional governance processes such as policy making, regulation, monitoring, compliance and enforcement, education and community engagement. Scholarship about social learning and recent literature about leadership both use complexity as a starting point. Both processes emerge from interaction

Table 2 – Governance Processes; Overview of social learning and leadership.

| Process | Description | Strengths | Weaknesses |
|-----------------|---|--|--|
| Social learning | Learning through interaction of individuals and/or communities (e.g. Folke, 2003; Pahl-Wostl et al., 2007). Three aspects of learning can be distinguished: research to enhance discovery and understanding, capacity building to enhance people's awareness and capabilities, and application to enhance practical outcomes (see also Senge and Scharmer, 2001). | When applied in informal settings, social learning can facilitate the development of innovative solutions to existing problems by providing opportunities to explore new ideas, devising alternative designs, and testing policy (Gundersen, 1999; Olsson et al., 2006; van Herk et al., 2011). As such, it plays an important role in connecting actors from different network communities (Olsson et al., 2004b, 2006). | Social learning is a time intensive process and requires the involvement of a range of stakeholders (van Herk et al., 2011). When social learning is organised in formal settings, members of social learning groups may feel scrutinised by their agencies or constituencies, resulting in limited freedom to learn from each other, think creatively and develop alternative solutions (Gundersen, 1999). |
| Leadership | Traditionally, scholarship has considered leadership in a transformational sense in which “leadership behaviours that inform and inspire followers to perform beyond expectations while transcending self-interest for the good of the organisation” (Avolio et al., 2009). More recently, complexity leadership theory has recognised that leadership is too complex to be described as only the act of individuals. From the perspective of complexity, leadership emerges from interaction between actors (Lichtenstein and Plowman, 2009; Uhl-Bien and Marion, 2009) and may occur as top-down, bottom-up and/or lateral processes (Avolio et al., 2009; Lichtenstein et al., 2006). | Transformational leadership can be characterised by persistence, enthusiasm, articulating inspiring vision, questioning the status quo, and providing inspiration and motivation to others (Bass, 1985, 1999). From a complexity perspective, leadership enables rather than controls the future (Uhl-Bien et al., 2007). Enabling leaders recognise or create windows of opportunity (Olsson et al., 2006) to disrupt existing patterns of behaviour, encourage novelty, and make sense of emerging events for others (Boal and Schultz, 2007; Plowman et al., 2007). Furthermore, enabling leaders create structures, rules, interactions, interdependencies, tension and culture (Marion, 2008). | Traditional forms of focused top-down leadership are usually ineffective in complex challenges, because they are not suited any more for the fast-paced, volatile context of the Knowledge Era (Marion and Uhl-Bien, 2001; Schneider and Somers, 2006). |

between actors in a network. They are therefore not mutually exclusive. However, there are obvious differences of behaviour and outcomes between social learning and leadership processes (see Table 2). Social learning is a critical factor for increasing receptivity to new approaches or technologies (Jeffrey and Seaton, 2004), creating and nurturing adaptive governance (Pahl-Wostl, 2007) and system resilience (e.g. Folke, 2006), and establishing transitions of systems as a whole (e.g. Loorbach, 2010). Leadership acts as a catalyst to change in otherwise self-organising complex networks (Bodin and Crona, 2009; Olsson et al., 2006).

From a review of social learning literature (see Table 2), it can be concluded that social learning is in particular suitable to increase understanding of the nature, degree and implications of problems and alternatives, values and implications of solutions. The collaborative processes on which social learning are based can potentially create or increase trust and shared norms and values. However, social learning is a process that requires time and effort. Leadership, on the other hand, catalyses change through triggering and coordinating action and engaging new actors. Although it could be less time demanding, it requires individuals in the network with leadership skills at management or project levels and/or organisations who have the capability and are willing to take up leadership roles. Actions resulting from strong leadership are not necessarily supported by a cohesive network which may potentially lead to a lack of legitimate outcomes. It could be concluded that the different outcomes of social learning and leadership processes cause different levels of fit of the applied process with its purpose in a certain context. For example, social learning is not a logical process to apply when strongly coordinated action is desired to deal with an immediate crisis. However, the fit of network processes is not only determined by the physical and social context of the network, but also by the network structure in which processes take place. As we have described above, strongly centralised network structures are effective for solving relatively simple problems, but are less effective in dealing with complex issues. Such network structures rely on traditional models of transformative leadership, but are likely to be too formalised to allow for social learning.

5. Concluding discussion

Adaptive governance is aiming to establish resilient systems. In the adaptive governance literature, it is argued that a mix of top-down and bottom-up management is well-placed to achieve this (see e.g. Berkes, 2002; Folke et al., 2005). Nelson et al. (2007, p. 499) go one step further by stating that “the strong normative message from resilience research is that shared rights and responsibility for resource management (often known as co-management) and decentralisation are best suited to promoting resilience”. Caution should be taken to avoid the conclusion that a multi-level governance approach alone is considered to be sufficient for establishing adaptive governance. Depending on the context and stakeholder needs, an adaptive approach can at different points in time include different purposes such as coordination of activities, generating new knowledge, and distributing

knowledge. As identified above, different governance structures and processes have different strengths and weaknesses and are therefore to a varying degree appropriate for different purposes. By evaluating the effectiveness of existing and proposed governance mechanisms, the fit-for-purpose governance framework can be applied as both a descriptive and a prescriptive tool to operationalise adaptive governance. When applied to governance arrangements that are already established, this procedure provides information about necessary adjustments. For example, it could be used to evaluate the success of established adaptation policies, or to evaluate the effectiveness of governance arrangements to stimulate transitions to more sustainable or resilient environmental resource management. Furthermore, it provides a procedure that could be applied for prediction of the likely success of planned reform(s); for example assessing the ability of Australian urban water markets to efficiently allocate scarce water resources in an institutional context that is dominated by one water service provider and rigid health regulation.

The fit-for-purpose governance framework could also be considered a step back from adaptive governance, because it provides direction for conducting one particular evaluation rather than a continuous cycle of regular evaluations in time. Hence, it only provides a starting point for adaptive approaches. However, by making the incumbent uncertainties relating to adaptive governance explicit it makes policy makers aware about a need for deliberation when setting up or reforming governance arrangements. By doing so, it points their attention at adaptive governance principles through insights into ineffective or inappropriate governance activities. Meanwhile it provides a research agenda for scientists for assisting to put adaptive governance into practice. Based on a literature review, this paper has shown that further work is needed for the development of practical tools for: (1) defining the purpose of governance and balancing interests, beliefs and values; (2) determining the relevance and impact of contextual conditions on different governance mechanisms; (3) determining the (expected) outcomes of governance mechanisms under different conditions.

The problem of fit is not new (e.g. Folke et al., 1998, 2007; Galaz et al., 2008; Young and Underdal, 1997). In particular, it is argued that matching governance with the dynamic characteristics of ecosystems and the inherent uncertainties related to (abrupt) change within both governance systems and ecosystems is challenging (Galaz et al., 2008). The fit of governance with its context depends on the temporal and spatial scales and the scope of institutions (Folke et al., 1998, 2007). In their words, “how does the scale (temporal, spatial, functional) of an institution relate to the ecosystem being managed, and does it affect the effectiveness and robustness of the institution?” (Folke et al., 2007, p. 2). The research about the problem of fit has attempted to enhance the fit through system evaluation (Ekstrom and Young, 2009), understanding different types of misfits (Galaz et al., 2008) and increasing understanding of adaptive (Olsson et al., 2007) and polycentric governance arrangements (Ostrom, 2010). In this paper, we add to this context/fitness dialogue the importance of purpose of governance and the procedures in which policy practitioners work. By emphasising the policy practitioners’

perspective, we aim to enrich the dialogue about the fitness of governance under different conditions.

However, we conclude that further research is needed to operationalise the concept of fit-for-purpose: because governance emerges from interaction between multiple stakeholders with multiple interests, beliefs and values, there are multiple perspectives about fit depending on individual interests and values. However, taking a holistic view and analysing the fit from different perspectives may give a good indication if there is a fit or not. Receptiveness of network actors to alternatives may indicate that there is a lack of fit in a certain system, because it indicates that an improvement could be achieved. Perhaps a stronger indicator for the fit-for-purpose of governance could be advocacy of network actors for alternatives. It is likely that advocacy is a stronger indication than receptiveness, because an advocate is committed to invest time, effort, and possibly capital and reputation to consider alternatives. Other indicators of lack of fit may be new scientific knowledge, disasters or community concern. Further work is needed to identify which indicators best determine the degree of fit in a specific context.

Hence, similar to the concept of adaptive governance, fit-for-purpose governance is not yet readily applicable in governance practice. The fit-for-purpose governance framework provides the ingredients for a diagnostic procedure, but lacks empirical evidence to show how the framework works in practice. However, it provides the basis for a new way of thinking to address impediments to the uptake of adaptive governance by using a procedure that has similarity with the predominant institutional arrangements of predict and control regimes in which most policy makers operate. As such, the fit-for-purpose governance framework provides an alternative starting point for developing the much sought-after guidance for policy and decision makers to evaluate the effectiveness of established governance arrangements and to predict the likelihood of success of institutional reform.

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