Addressing the Resilience-Community Dynamic: Climate Change Adaptation, Natural Disaster Management and the need for Policy Resilience

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> *Resilience* is '[t]he ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions' (UN 2009).

Introduction

Resilience is now a widely considered term in various fields of study, including engineering, ecology, social science, psychology and public policy (Adger 2000). Our focus here is upon clarifying the meaning of resilience in the applied fields of climate change adaptation policy (CCAP), and natural disaster management (NDM). We argue that the critical resilience-community dynamic is problematic and unclear, not least because of a lack of theoretical clarity with respect to the meaning of the term 'resilience' in social contexts, global-local contexts, and in the context of public policy and preparedness. This dynamic needs addressing with some urgency given climate adaptation challenges and the heightened occurrence of natural disasters around the world including bush fires, flooding and earthquakes in recent times (Petra and Kathleen 2010). We are interested not only in definitional clarity of the term resilience for society in general (Nelson R et al., 2007), but also what resilience means for public policy development and practice. This paper firstly considers interpretations of the 'resilience' concept and, following a review of relevant literature, defines resilience in the contexts of CCAP and NDM. It addresses a number of common policy issues in relation to CCAP and NDM that have emerged in the literature, and recommends an adaptation of the policy cycle and further development of policy resilience theory in order to move towards social and community resilience.

What is Resilience?

Resilience is much studied across various disciplines (Adger 2000; Gallopin 2006; Gunderson and Holling 2002; and Reid et al 2013). The concept emerged in the 1960s in physical science and mathematics focusing on the stability of a material or system and its return to equilibrium after a displacement based on a distinction between engineering and ecological resilience (Davoudi S 2012; and Norris et al. 2008). Second phase analysis focused on *engineering resilience* or the 'efficiency, control, constancy, and predictability, all attributes at the core of desires for fail-safe design and optimal performance.' (Adger 2003; Gunderson and Holling 2002: 27-28; and Holling 1986). Third phase analysis focused on *ecosystem resilience* measuring the persistence of systems and their ability to absorb change and to adapt to disturbance whilst maintaining the same relationships 'between populations or state variables' (Gunderson and Holling 2002).

The fourth phase of analysis is focused on *socio-ecological resilience* (Maguire and Cartwright 2008) *evolutionary resilience* (Scheffer, 2009) and the ability of complex socio-ecological systems to cope with change, adaptation, and transformability in response to disturbance and stress (Davoudi 2005). The social aspects of resilience have been considered by various disciplines. In psychology, resilience measures the degree and type of support required for personal resilience in particular after disturbance (Richardson 2002). In economics, resilience is defined as the economic conditions and responses required after the impacts of disasters (Rose 2004; and Reid et al 2013). Lastly, in sociology *social resilience* and/or *community resilience* is an individuals' and social groups' ability to respond and adapt to environmental change (Adger 2000). Adger (2000) argues that although the concepts of resilience are varied, the roots are the same and related to each other. In the social context, the meanings of ecological, economic, social systems are all interconnected in human society and thus not essentially different. In terms of CCAP and NDM, resilience is broadly accepted as the need to develop the ability to respond to, and to learn form, adaptation and disaster contexts, and to incrementally adapt to both risk and environmental change for human society and community (The United Nations International Strategy for Disaster Reduction [UNISDR] 2002; and the World Bank 2011; and IPCC 2014). We argue that, beyond these definitions, there is a neglected *policy resilience* that is a key means of underpinning and potentially better achieving CCAP and NDM resilience, whilst also building the capacity to address and integrate community concerns.

Integrating Resilience, CCAP and NDM

Resilience appeared in the CCAP and NDM literature decades ago in the 1970s. It became widespread by the 1990s, and remains so today in conceptual discussions about the various meaning of resilience, and applications in the social sciences. In 2002, The *United Nations International Strategy for Disaster Reduction* [UNISDR](2002) defined resilience as 'the capacity of a system, community or society to resist or change in order that it may obtain an acceptable level of functioning and structure' (Christoplos, 2006). In 2005, the *Hyogo Framework For Action 2005-2015* explicitly recognised the need for a comprehensive global approach to disaster risk reduction that is part of a sustainable development approach and is integrated across all sectors and disciplines and fundamental to CCAP. One of the primary objectives of the Hyogo framework was to build the resilience of nations and communities (UNISDR 2005). This was a major breakthrough in international cooperative governance and a precursor to the *Sendai Framework for Disaster Risk Reduction 2015-2030*.

The next conceptual advance was in 2007, when the issue of climate change was incorporated with disaster risk management and therefore entered a new era with an expanded emphasis. CCAP was also becoming an increasingly important public policy domain; with climate change being the expected increase in extreme weather and climatic conditions, associated with an increasing risk of natural disasters (IPCC 2007). Consequently, in the Bali Action Plan, leading developed nations, as parties to the United Nations Framework Convention on Climate Change, identified disaster risk reduction strategies as a tool for climate adaptation (UNFCCC 2007). Climate adaptation policy and NDM therefore became significant in building new connections for policy makers and policy frameworks and for their practice in various fields with the intention of achieving sustainable social resilience. However, in practice,

resilience is inconsistently expressed in policy frameworks and activities, and is often simply implied or left unexplained. We argue that this limits the efficacy of CCAP and NDM plans, objectives and processes (Funfgeld and McEvoy 2012).

Using the terms of 'resilience' or 'risks' has become problematic in terms of CCAP and NDM. These terms are unclear, not specific and ambiguous, and used to signify different concepts in different situations (Reid et al 2013). Although the demands for measuring policy outcomes to achieve resilience and risks that constitute adaptation are observed at a variety of scales, much of the analysis employed for policy adaptation processes are too narrowly conceptualised by technological or technical interpretations to respond to specific risks and improvements, let alone community based concerns. The policy focus is typically on outcomes: too many complications and specific identifying problems regarding which policy or technology choices limit the credibility and usefulness of adaptation policies. There is a need to address broader issues and to consider normative understandings and long-term system variability, in order to better address sustainable policy outcomes (Nelson D et al 2007). Given this need, the following section will do this by addressing a number of common issues in relation to CCAP and NDM in order to improve understandings of resilience in climate and disaster policy and community-related contexts.

Issues Common to Resilience Governance

A number of common shortcomings have emerged from 'resilience' studies in past and current experiences concerning policy practice, especially in the field of CCAP and NDM, which can be drawn upon as a means of improving the social resilience.

First, there is a *lack of integration* and framework between bottom-up and top-down actions for policy making for disaster risk reduction, which is also significant in development policy and climate change literature (O'Brien et al 2006). This interpretation will allow availability of a variety of tools and methodologies and everyone to share their knowledge and expertise for the decisions and implementation (Gillard 2010). Second, in most of the current discussions, the integration of disaster risk reduction into CCAP has been criticised for *not clearly addressing factors of risk* and associated issues (United Nations Development Group 2009). Third, there is a *demand for strong government leadership* and action. In the global context, national governments and international organisations will have to commit to make these priorities for development policy in order to transfer and adjust lessons for each local context (Gillard 2010). Fourth, there is a need to *consider appropriate scale and governance* but this needs to be associated among these different scales for policy development. An appropriate governance structure creates the capacity to respond effectively to the climate change-related risks and to the need for decarbonisation, both of which are essential for adaptation and mitigation activities (Adger et al 2011), as well as NDM (Gillard 2010).

Fifth, the policies need a *clear current and future direction*. This would allow policy preparedness in responding to disaster and includes the capacity to design an effective activity to cope with current or future events, considering various aspects of policy, including physical capital, technology and infrastructure, information, knowledge, institutions, the capacity to learn, and social capital (Adger et al 2011). Sixth, there is a need for appropriate policy decision-making with community involvement, depending on the context. Policy adaption needs to be *developed, through community*

debate and collaborative decision-making processes, into appropriate strategies for dealing with ongoing change at an appropriate scale, in specific geographical and cultural contexts (Porter, L and S. Davoudi 2012). Seventh, the policy needs a careful *evaluation and review process* in terms of past implementations and experiences. There is no successful policy response without examining governance, sensitivity to feedbacks, and problem framing to evaluate impacts on characteristics of a resilient system (Adger et al 2011). There is often criticism of who reviews the process and transforms the past learning into new challenges (Para Tschaker et al 2010).

There are significant common issues found in the 'resilience' studies dealing with CCAP and NDM. From the public policy perspective, although climate change needs new policy approaches incorporating sustainable development in dealing with complex interactions between climate and social ecological systems (UNU-EHS 2014), notions and issues of resilience are equally complicated yet, currently, are narrowly conceptualised. Furthermore, in terms of resilience theory and practice there is still a gap between the unclear and ambiguous definitions, and policy practices. We argue that this is a neglected dimension of the resilience challenge and that policy makers need, at the minimum, to set clear definitions of resilience and its directions (Reid et al 2013) because '[t]he current confusion and ambiguity within resilience thinking is problematic for operationalizing the concept within policy making' (Davidson J et al 2016, 1pp). Many of the issues with operationalizing resilience do not seem to be new to the field, however they have not been clearly articulated in terms of the success and/or failure of policy frameworks. This could be addressed quite simply in the first instance, we argue, by specifically pursuing policy resilience Policy resilience could be accounted for by way of integration with the heuristic public policy cycle, with the various stages of the cycle, including public consultation, to be reinterpreted to account for CCAP and NDM contexts. The following section will very briefly describe our current thinking on how the basic principles of the policy cycle could be useful for integrating such issues.

Policy Cycle

There are several stages in basic policy development processes, which, in theory, may follow sequentially, but, in practice, simply describe various aspects of the policy making process that, if addressed, will enhance the likelihood of policy successes. In the first instance, policy resilience for CCAP and NDM would be integrated into such a process or policy cycle as it is sometimes called [Fig. 1]. In the basic policy model, *Agenda-setting* refers to the process by which problems are brought to the attention of policy makers. The second stage is *Policy Formulation*, refers to the process by which policy options on issues raised are formulated within government. The third stage is *Decision-making* in which decision-makers and/or governments choose action or non-action; *Policy Implementation* refers to the process by which governments put policies into effect; *Policy Evaluation* refers to the process by which the results of policies are monitored by both state and non-state actors, the end result of which may be re-conceptualisation of policy issues and solutions (Howlett and Ramesh 1995). This policy process is rarely practiced as the theory suggests, although with sufficient public pressure, political will and allocated resources it can be.

In terms of the meaning of resilience for CCAP and NDM, it is broadly accepted that there is a need to develop the ability to respond to, and to learn from, adaptation and disaster contexts and to incrementally adapt to both risk and environmental change.

We believe that the policy cycle has the potential to helpfully depict the complicated meanings, concepts and technical solutions of building resilience by identifying discrete policy stages, activities and practices. We consider that the policy cycle, with adaptive cycles included for building social resilience, may be useful for presenting a clearer picture of the complex issues and discussions that have been discussed here. This notion suggests that CCAP and NDM policy could also comprise such stages, that it can incrementally improve as part of implementation and evaluation processes, and that the aim of community informed social resilience can therefore be achieved through transformation as a process of policy adaptation and learning (Fig 1).

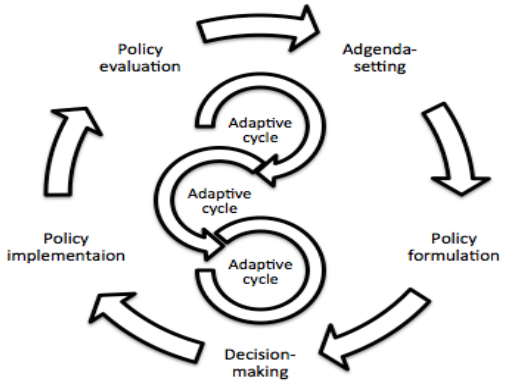

Fig 1: Policy Cycle & Adaptive Cycle Integration for Resilience / Nakamura and Crowley 2016

Conclusion

This paper has found 'resilience' to be a common concern and concept across various disciplines with multiple interpretations, with notions of resilience both complicated and narrowly conceptualised in practice. The result to date has been unclear policy directions and limited efficiency in CCAP and NPM policy processes and outcomes. A simplification and broadening of the term 'resilience' is required in order to see 'the forest rather than the trees'. We have argued that an adaptation of the classic policy cycle presents an immediate means of representing a simplified notion of resilience and how to achieve it, yet with an appreciation of the broader context of resilience that is required for improved CCAP and NDM policy. Significantly, the policy cycle also places an emphasis upon community consultation that aligns with the urgent need to address the resilience-community dynamic that is the key to successful disaster prevention, preparedness and recovery. On several grounds therefore, there is a clear need, we suggest, to develop a stand alone theory for CCAP and NDM *policy resilience* in order to achieve improved implementation and outcomes in the field of climate change and natural disaster management.

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