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RESEARCH PAPER

Framing disaster resilience

The implications of the diverse conceptualisations of "bouncing back"

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Abstract

Purpose – To confront the increasingly devastating impacts of disasters and the challenges that climate change is posing to disaster risk management (DRM) there is an imperative to further develop DRM. The resilience approach is emerging as one way to do this, and in the last decade has been strongly introduced into the policy arena, although it is not new for DRM practitioners and researchers. Nevertheless, resilience is a highly contested issue, and there is no agreed definition of it, which has resulted in confusion for stakeholders when applying it to practice. Therefore, the purpose of this paper is to investigate how resilience is framed by researchers and DRM practitioners.

Design/methodology/approach – The analytical framework used was Hajer's "social-interactive discourse theory", combined with analysis of government documents, in-depth interviews with practitioners and observation of field and practices within the context of the Natural Disaster Resilience Program in Queensland, Australia.

Findings – One of the key findings is that the idea of "bouncing back" is central to the resilience discourse but different interpretations of this idea results in real-world implications. Three different ways (storylines) in which practitioners construct the meaning of disaster resilience emerge from this study. Importantly the divergences between these storylines reveal possibilities for reframing to occur and these could lead to different policy options and practices.

Originality/value – The results presented in this paper offer empirical evidence on how resilience is understood on the ground, contributing to extending resilience theory and informing DRM and resilience practice.

Keywords Climate change, Disasters, Disaster risk management, Resilience, Framing, "Bounce back"

Paper type Research paper

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Introduction

Disaster risk management (DRM) paradigms have evolved considerably since the contributions of Prince (1920) and White (1945), who studied the influence societal groups have in disasters impacts, and these advances have been helpful in improving DRM practice (Cardona, 2011). However, in many places response is still inadequate (United Nations International Strategy for Disaster Reduction, 2011), contributing to disasters being an increasing cause of economic loss and suffering (Aldunce and González, 2009; Thomalla *et al.*, 2006). Thus, many researchers agree that there remains an imperative to continue improving DRM (Debels *et al.*, 2009; Djalante *et al.*, 2012). Additionally, the patterns of climate-related hazards are acknowledged as increasing in frequency, magnitude and duration (Intergovernmental Panel on Climate Change, 2007), contributing to increasing disaster impacts and losses (Intergovernmental Panel on Climate Change (IPCC), 2012). The resilience approach has emerged as a paradigm which could help in advancing the DRM evolution (Adger *et al.*, 2005; O'Brien *et al.*, 2010) and this approach influencing many research fields aside from DRM (Pelling, 2011).

Decision makers associated with DRM have started to include ideas of resilience as a central element in international documents, and policies and programmes at national and sub-national levels (Djalante and Thomalla, 2011). Nevertheless, it is argued that this has happened without sufficient theoretical and empirical grounding in social sciences (Brown, 2011, p. 37), and that the concept is ambiguous and its usefulness for DRM is controversial and contested (Manyena, 2006). In addressing these concerns, this research used a case study approach and discourse analysis (DA) to better resolve the meanings underpinning the invocation of resilience in DRM. There are a few discourse analyses of resilience in the literature and these are mainly based on the analysis of policy documents and the media (see e.g. Bohensky and Leitch, 2013; Brown, 2011). In our study respondents were directly asked about their understanding and use of "resilience", in order to explore how different stakeholders construct the meaning of disaster resilience.

The paper first presents the analytical framework and background information on the Natural Disaster Resilience Program (NDRP) that provides the empirical material for the study. Then, it explores how the concept of resilience is framed in the literature. The paper continues by presenting and discussing the results through the interviewees' framing of resilience and in particular focuses on their conceptualisation of "bouncing back" within this framing. The conclusions reflect on the significance of resilience for DRM and its potential impact for improving on-ground outcomes.

Analytical framework, methodology and the case study

The implementation of the NDRP, Australia, was used to investigate how practitioners view resilience. The study was conducted at the state level in Queensland and at two local sites: Charleville and Gold Coast. This investigation used DA guided by Hajer's (2000) "social-interactive discourse theory". DA provides a framework that is sensitive to the recognition that practitioners, as actors involved in policy implementation processes, give different meanings to ideas and concepts (Fischer, 2003). And within these actors, Hajer (2000) refers to discourse coalitions which are constituted by a group of actors who perceive that their interest and positions are represented in a specific storyline (Hajer, 2000, 2005, p. 65). As in other studies (Mander, 2008; Somorin *et al.*, 2012), the coalitions in this research were identified during the interview analysis by aggregating actors as they described common discourse categories, discursive

devices and structures, in order to illuminate the different positions (storylines) that emerged. Once the data were organised in storylines, the information contained in each storyline was compared with the discourse and frame analysis literature. As in Bosomworth (2012), this allowed us to search for corresponding frames that better represented the values contained in the storylines, and to allow these to emerge within the case study Some examples of such frames in the literature are those associated with "sustainability", "community-based", "modernist development" and "neo-liberal" discourses (Bosomworth, 2012; Brooks *et al.*, 2009; Hajer, 2000; Heijmans, 2009; Walker and Cooper, 2011).

The methods selected for this research were observation, document analysis and in-depth interview. Observation was undertaken during fieldwork, from November 2009 to February 2011, at formal and informal meetings, and by visiting the physical settings. Ten government documents that accompanied the implementation process of the NDRP and more than 15 grant applications for funding to the programme were analysed. Participants were key informants with direct engagement with the NDRP, including: personnel from government, non-government, private and research agencies at the state and local levels. Thirty participants were interviewed, resulting in 27 analysed interviews.

To organise, classify, analyse and integrate data, two computer software programmes were used and combined; EndNote X3 and NVivo 9. Qualitative thematic analysis was then undertaken. For document analysis, whole documents were imported to EndNote and after reading the document, the main ideas were summarised in the "Research notes" section of this software. Additionally, if the document contained some passages with a direct relation to categories of the thematic analysis, the text passage of interest was coded into a node. Similarly, notes from the observation process, walks and interviews were directly imported into NVivo as memos. By doing so, we were able to theoretically and physically link this information to other components of the data for further integration and analysis.

The interviews as digital records were fully transcribed to Word documents. Second, a code skeleton or tree node was developed. This included the main categories or organising principles (Verloo, 2005), based on the main themes discussed in the interview. The second step of coding was topic coding in which, by reading the interviews, we searched for different topics discussed in the different passages of the interviews, and located them in the first hierarchy nodes of the tree node. This is a type of closed-coding. Within the third step of coding the process of building up the data to concepts occurred (Creswell and Piano Clark, 2007), called analytical coding (Richards, 2009). This is an open-coding, which by abstraction generated new categories (Pyles and Harding, 2011). These categories then formed nodes as part of a second hierarchy in the tree node. Analytical coding required an inductive and interpretative decision process, where patterns emerged by looking for connections through juxtaposition (Bryman, 2008), rather than a prescribed or linear method of analysis (Pyles and Harding, 2011). We identified phrases or word clusters, and the thematic codes were derived from recurring phrases and word clusters and initially grouped according to respondents' use.

Analytical coding allows the researcher to carry out thematic analysis, by building up patterns in the storylines of the participants (Subban, 2009). This approach is appropriate for DA as it assisted in constructing the different storylines, in particular by exploring divergent patterns and competing claims of discourse devices held by the different actors (Mander, 2008; Somorin *et al.*, 2012; Subban, 2009).

Framing of resilience in the literature

Conceptualising resilience: origins and evolution

The origin of the theoretical application of resilience is contested and it has been argued that its root can be found in a number of disciplines (Bodin and Wiman, 2004; Moser, 2008). Bodin and Wiman (2004) suggested that resilience emerged in ancient thinking, and was first developed in mathematics and physics. In psychology and psychiatry resilience can be traced to the work of Garmezy, Werner and Smith in the 1940s (Waller, 2001). The ecological root of the resilience perspective emerged in the 1960s and 1970s (Folke, 2006; Moser, 2008), from a series of studies carried out by authors such as Holling (1961), Lewontin (1969), May (1972) and Rosenzweig (1971).

Regardless of its origins the resilience approach has been applied to different fields and disciplines, leading to multiple definitions of the concept (Norris *et al.*, 2009). Table I presents a list of resilience definitions. The list is not an exhaustive review of definitions, but illustrates the evolution of the concept and the diversity with which it has been defined (for more definitions see e.g. Bahadur *et al.*, 2010; Djalante and Thomalla, 2011; Manyena, 2006; Moser, 2008; Norris *et al.*, 2008).

Dominant characteristics for each discipline's use of "resilience" can be summarised by analysing the resilience concept from Table I. In mathematics and physics resilience describes the ability of a material or system to bend or resist without breaking, and the speed at which it returns or "bounces back" to equilibrium after a displacement (Bodin and Wiman, 2004; Gordon, 1978; Norris *et al.*, 2008).

In the disciplines of psychology and psychiatry, resilience has been applied to individuals or collectively to human communities, and lately to large societies (Norris *et al.*, 2008). From its roots in these disciplines the use of resilience has spread to other social sciences' disciplines and fields and therefore community and social resilience were included here. Resilience in this group refers to the process, outcome or capacity of individuals and communities to resist, recover and return to baseline functioning after a misfortune, stress or external shock (Norris *et al.*, 2008; Pfefferbaum *et al.*, 2005). Some authors went further by stressing that resilience also involves adaptation (Egeland *et al.*, 1993) and "strengthen community bonds" (Chenoweth and Stehlik, 2001). Norris *et al.* (2008) indicated that a resilient community embraces a set of adaptive capacities which are determined by networked resources including economic development, social capital, information and communication and community competence.

Within ecology, Holling's (1973) seminal paper described what is nowadays known as "resilience thinking". In its origins, one of the central elements in the conceptualisation of ecological resilience emphasised the notion of "system" (Holling, 1973). This idea evolved into conceptualising coupled social-ecological systems (SES) and complex adaptive systems (Adger *et al.*, 2005; Gunderson and Folke, 2005). The concept of resilience here originally focused on the ability of a system to absorb perturbation and persist without changing its fundamental structure (Holling, 1973). The idea of persisting or withstanding external shocks evolved into the capacity to adapt, in which complex systems are described as capable of self-organisation, learning, renewal and continuous development (Adger *et al.*, 2005; Gunderson and Folke, 2005; Liu *et al.*, 2007; Resilience Alliance, 2012). For the social component of the system to be able to learn and change, key elements are needed. These elements include an institutional context which promotes sharing knowledge and the presence of social capital with strong connections (Gunderson and Folke, 2005; Norris *et al.*, 2008). Diversity and redundancy within SES are two characteristics described as

Publication: author and year	Disciplines	Definition
Gordon (1978)	a	The ability to store strain energy and deflect elastically under a load without breaking or being deformed
Bodin and Wiman (2004)	a	The dynamic behaviour of the system as it strives (if at all) to return to equilibrium, i.e. the extent to which, and the speed with which return occurs
Egeland *et al.* (1993)	a	The capacity for successful adaptation, positive functioning, or competence, despite high-risk status, chronic stress, or following prolonged or severe trauma
Brown and Kulig (1996)	a	The ability to recover from or adjust easily to misfortune or sustained life stress
Chenoweth and Stehlik (2001)	a	Communities can be considered as being resilient when they respond to crises in ways that strengthen community bonds, resources and the community's capacity to cope
Krimsky (1992)	a	Individuals' sense of the ability of their own community to deal successfully with ongoing political violence
Pfefferbaum *et al.* (2005)	b	The ability of community members to take meaningful, deliberate, collective action to remedy the effect of a problem, including the ability to interpret the environment, intervene, and move on
Adger (2000)	b	The ability of communities to withstand external shocks to their social infrastructure. The ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change
Holling (1973)	c	The persistence of relationships within a system and as a measure of the ability of systems to absorb changes of state variables, driving variables, and parameters, and still persist
Holling *et al.* (1995)	c	It is the buffer capacity or the ability of a system to absorb perturbation, or the magnitude of disturbance that can be absorbed before a system changes its structure by changing the variables
Adger *et al.* (2005)	c	The capacity of linked social-ecological systems to absorb recurrent disturbances such as hurricanes and floods so as to retain essential structures, functions, and feedbacks. Resilience reflects the degree to which a complex adaptive system is capable of self-organisation and the degree to which the system can build capacity for learning and adaptation
Gunderson and Folke (2005), cited in Moser (2008)	c	The return or recovery time of a social-ecological system, determined by (1) that system's capacity for renewal in a dynamic environment and (2) people's ability to learn and change (which, in turn, is partially determined by the institutional context for knowledge sharing, learning, and management, and partially by the social capital among people)

Table I.
Illustrative definitions of resilience

(*continued*)

Publication: author and year	Disciplines	Definition
Liu *et al.* (2007)	c	The capability to retain similar structures and functioning after disturbances for continuous development
Resilience Alliance (2012)	c	The ability to absorb disturbances, to be changed and then to re-organise and still have the same identity (retain the same basic structure and ways of functioning). It includes the ability to learn from the disturbance. A resilient system is forgiving of external shocks

Notes: a, physics and mathematics; b, psychology and psychiatry, expanded to include community and social resilience; and c, ecology, also expanded to social resilience

Table I.

essential for maintaining resilience, in both ecological and social subsystems (Folke *et al.*, 2005). At the same time, it is important to sustain the individuality and uniqueness inherent of different components (Folke *et al.*, 2005). Further analysis of the resilience literature is detailed in the next section where resilience theory is discussed in the context of DRM.

Disaster resilience: unpacking a contested concept

Resilience is not a new concept for DRM practitioners and researchers. Over the last decade the concept has gained more attention and credibility in the DRM field (Moser, 2008), especially after the adoption of the "Hyogo framework for action 2005-2015: building resilience of nations and communities to disasters" (United Nations International Strategy for Disaster Reduction (UN/ISDR), 2007). Early use of resilience in DRM included authors such as Timmerman (1981) and Torry (1979). Studies in disaster resilience have been conducted based on different approaches and coming from different disciplines, covering the entire spectrum from social to biophysical sciences (examples of studies that included diferent perspectives can be found in Adger *et al.*, 2005; Barnett, 2001; Berkes, 2007; Godschalk, 2003; Handmer and Dovers, 1996; Handmer and Hillman, 2004; Paton *et al.*, 2001, 2000; Renaud *et al.*, 2010; Tobin, 1999; Tompkins, 2005; Torry, 1979).This spectrum of use of resilience ideas has resulted in a multiplicity of resilience definitions (Gaillard, 2010; Twigg, 2007). Table II presents an illustrative list of resilience definitions and its evolution within the DRM field. It is not the intention of this study to conduct a historical review (for revisions of definitions of disaster resilience refer to Bahadur *et al.*, 2010; Buckle, 2006; Djalante and Thomalla, 2011; Norris *et al.*, 2008).

Within the DRM literature one of the most common references to disaster resilience relates to the capacity of a society to "bounce back", cope, withstand, resist and recover quickly from the impacts of hazards (Bruneau *et al.*, 2003; Klein *et al.*, 2003; Mileti, 1999; Timmerman, 1981; Wildavsky, 1991). Two main ideas can be extracted from this: the idea of the speed at which a system bounces back and the idea of the bounce back itself. The latter interpretation derives from the roots of resilience in Latin, in which resiliere means to jump back. In turn, with the influence of a systemic understanding of resilience, the concept has evolved from coping or resisting into adapting, from everyday coping to long term strategic adaptation; and from stability to adaptability, to discontinuous change and to alternate stable states. This evolution of the concept has

Author	Definition
Timmerman (1981)	The capacity of a system to absorb and recover from the occurrence of a hazardous event
Wildavsky (1991)	Resilience is the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back
Handmer and Dovers (1996, p. 501)	From the three types of resilience defined by these authors, resilience as "openness and adaptability" is understood as an approach that has a high degree of flexibility. Preparedness is key in order to adopt new operating assumptions and institutional structures, and to adapt to the consequences of change and uncertainty rather than resist them
Mileti (1999)	Local resilience with regard to disasters means that a locale is able to withstand an extreme natural event without suffering devastating losses, damage, diminished productivity, or quality of life without a large amount of assistance from outside the community
Comfort (1999)	The capacity to adapt existing resources and skills to new systems and operating conditions
Paton *et al.* (2000)	Resilience describes an active process of self – learned, resourcefulness and growth – the ability to function psychologically at a level far greater than expected given the individual's capabilities and previous experiences
Klein *et al.* (2003)	Facilitates and contributes to the process of recovery […] describes specific system attributes concerning the amount of disturbance a system can absorb and still remain within the same state or domain of attraction and the degree to which the system is capable of self-organisation
Bruneau *et al.* (2003)	The ability of social units (e.g. organisations, communities) to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimise social disruption and mitigate the effects of future earthquakes
Pelling (2003)	The ability of an actor to cope with or adapt to hazard stress
Longstaff (2005)	The ability by an individual, group, or organisation to continue its existence (or remain more or less stable) in the face of some sort of surprise […] Resilience is found in systems that are highly adaptable (not locked into specific strategies) and have diverse resources
Paton (2006)	The measure of how well people and societies can adapt to a changed reality and capitalise on the new possibilities offered
UN/ISDR (2007)	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organising itself, to increase this capacity for learning from past disasters for better future protection and to improve risk reduction measures
IPCC (2012)	The ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the reservation, restoration, or improvement of its essential basic structures and functions

Table II.
Definitions of resilience applied to disaster risk management field

added weight to a positive interpretation of resilience by stressing that the conceptualisation of disaster resilience opens up opportunities and is a catalyst for development and improvement, for "doing it better", but also for change and innovation by "doing it differently" (O'Brien *et al.*, 2010, p. 499; Paton, 2006).

Another relevant aspect within the disaster resilience conceptualisation is the capacity to prepare in order to mitigate, prevent and minimise losses, suffering and social disruption (Bruneau *et al.*, 2003; IPCC, 2012; Mileti, 1999). In turn, self-reliance

has been pointed out as another characteristic of being resilient, interpreted as the ability to withstand without great dependence on external help (Mileti, 1999). Refinement of the idea of self-reliance led to the conceptualisation of self-organisation, meaning that systems or societal groups have the ability to organise themselves when affected by a disaster as well (Klein *et al.*, 2003; UN/ISDR, 2007). Finally, diversity, redundancy and interdependence are recognised as important factors for building resilience to disasters (Wildavsky, 1991); which share in common with a systemic understanding of resilience.

Storylines in the disaster resilience discourse and opportunities for reframing

The following sections reflect on the analysis, discussion and implications that emerged from the case study, relating to the disaster resilience discourse. As outlined in the methods, results presented here are based on qualitative inductive thematic data analysis and this contributed to a particular storyline or narrative frame. This narrative is epitomised in the paraphrased quotes and representing illustrative quotes.

Three narratives emerged in the way interviewees from the NDRP framed disaster resilience and these corresponded to policy meta-frames described in the discourse and frame analysis literature (Bosomworth, 2012; Brown and Westaway, 2011; Heijmans, 2009). These three meta-frames are distinguished as "mechanistic/technocratic", "community-based" and "sustainability". In the NDRP findings the mechanistic/technocratic storyline emphasised the idea that the conventional DRM focus on recovery and response has led to insufficient attention being paid to disaster preparation. Through the prism of this storyline, improving preparation through improved bureaucratic ordering and auditing would address this deficit. This storyline established strong normative claims and a managerialist style, reinforced by regulations. Brooks *et al.* (2009) attributed this kind of framing to the hegemonic influence of the modernist development discourse. This storyline was expressed through promoting top-down and command-and-control approaches. In effect this storyline countered what has been conceptualised as contributing to community resilience (Norris *et al.*, 2008). As a result of this mechanistic stance, a central role was given to government agencies and practitioners in this narrative tended to constrain the role of communities:

> […] we [government agencies] are doing this [logging the applications] on behalf of our community and that's why all of the agencies [government agencies] that I was describing before that sit in this room are all part of that process (lg15).

Interviewees in this storyline appealed to technocratic ways of operating, to rational ordering of what was required and to rational, technical knowing leading logically to objective and relatively predictable outcomes:

> […] my definition of resilience would be that we [government agencies] actually provide an environment where a given disaster will have a minimised effect or at least a smaller effect. I was just talking about the beaches, if we get our one in 50 year storm hit the beaches, I'd like to think that our sand reserves on the beaches are such that along with the walls that we have, et cetera, that we don't actually lose any major bits of infrastructure (lg7).

As described in the literature rational solutions and responses are supposed to follow logically from science, knowledge, expertise and measurable information (Fischer, 2003). As stressed by Lash and Wynne (1992) this has been a dominant discourse in the DRM policy domain, and concurs with a modernist paradigm, permeated as it is by anthropocentrism (Fischer, 2003). The implication of practitioners within this framing is that they expect to control the environment, and continue promoting "business as

usual" by stressing stability, and restricting change. They do not see the need for promotion of different kinds of management and policy. This framing focuses on approaches such as warning systems, risk assessments, improving zoning and infrastructure. These approaches are relevant but they also could represent a danger as they can neglect the social aspects of management. The meta-narrative here around predictable and controllable change, reflects an engineered approach to resilience. This is diametrically opposed to the socio-ecological conceptualisation of change within resilience thinking. It ideally promotes change and renewal.

The community-based storyline was the most common among the interviewees. Its central values embrace the relevance of the social and the role of communities in DRM. This storyline may be rooted in the evolution of resilience theory within the discipline of psychology which has led to the conceptualisation of community resilience (Chenoweth and Stehlik, 2001; Norris *et al.*, 2008; Pfefferbaum *et al.*, 2005) or it may be influenced by the rapid adaption in the 1990s of community-based disaster risk management (CBDRM) approaches (for a review of the CBDRM discourse see Heijmans, 2009). The central thrust within this storyline is that, even if the goal is to be better prepared to cope with and to bounce back from disasters, the way it is achieved cannot be based on engineered resilience alone, and so this shifts the emphasis from the importance of the centre in the mechanistic/technocratic storyline to the relationship between the bureaucratic centre and the target communities:

> I guess the bottom line is to make communities more able to cope with disasters themselves […] there's been a real shift as you're probably aware, shifting the responsibility over to communities so therefore resilience has to increase […] I think we need to support and empower communities more, yes, to be able to handle situations better themselves without waiting for somebody to rush in and help […] to transfer some responsibility, more responsibility onto communities rather than relying on government agencies […] move towards shifting responsibility and action down onto individuals and communities (sr5).

The framing as community based is not focused in technology and government agencies, but in community self-reliance and participation. Interestingly, the importance given to self-reliance echoes a similar trend within current neo-liberal discourse (Walker and Cooper, 2011), in which an argument is made that communities are capable of managing themselves and can be less dependent on government, by means of "owning" the risk and asserting responsibility for the process of building resilience. We argue, however, that community-based devolution of responsibility needs to be accompanied with political will and sufficient institutional support and conditions to enable more realistic community empowerment. Nonetheless, within this storyline, there is a focus on the relationship between government and community that shifts attention to the social fabric of community knowledge and engagement.

Within the community-based storyline, interviewees tended to blame our modern lifestyle as having increased individualism to the extent that there is less interaction between individuals within communities and in relation to government. A central value throughout this narrative was the importance of enhanced social capital:

> […] [resilience] it's more of a collective as a group, because if you have a sense of belongingness in the community, a feeling of – you have ability to – to help one another, because I believe resiliency, while it is an individual response, it's also a collective response (lr1).

The importance of social capital and enhanced community engagement and understanding is stressed as central for building resilience (Gunderson and Folke, 2005; Mileti, 1999; Norris *et al.*, 2008). These authors concur with the community-based

narrative in this research, that reinforcing networks, connections and relationships builds social resilience. The latter draws attention not only to the importance of social components as part of the system, but also to the weight given to connectivity and networks between individuals and organisations, which is a common characteristic of resilience theory with SES and social resilience.

The third storyline had fewer adherents. It concerned the broader discourse of sustainability associated with how humans relate to the natural environment (Hajer, 2000). Similar to what has been described by other authors (Berkes, 2007; O'Brien *et al.*, 2010), participants professing this narrative, argued that societal problems are rooted in the disconnection of humans from nature. This fundamental disconnect, resulted in interventions that attempted to control nature; and, in people being risk averse and fearing nature:

> […] What decreases our resilience to a certain extent though is that we're not used to having to fight for what we want, we don't accept that there will be change. We want things just to be the same […] We're not God, we can create our own environment up to a certain point but we don't control that (sp13).

Conceiving the world as a system that couples humans with the environment is an important value within this frame. This resonated with resilience thinking, as a SES (Nelson *et al.*, 2007). The importance of this framing is that it promoted values such as learning to live with nature, and consequently with unpredictable changes and the uncertainty attached to such changes. We argue that for the latter practices that enabled opportunities for learning and adaptation are required.

The results show that the three disciplines (engineering, psychology and ecology) that are represented in various ways within the evolution of resilience theory, have contributed to some extend to the three storylines that emerged in this research. However, some storylines are closer to one of the aforementioned disciplines. The mechanistic/technocratic storyline is closer to the origins of resilience in engineering; the community-based narrative related to psychology; and, resilience that focuses on sustainability seems to have more in common with ecology. Participants held different positions (storylines) that led to different social and cognitive commitments. DA stresses the consideration that all positions are important, that none are right or wrong, and that no one framing is better than another (Schön and Rein, 1994). Consequently, the aim was not to identify an ideal policy position or to validate one particular frame; rather DA exposed and explored the three different storylines as they emerged in the interviews. The key implications arising from an awareness that different positions exist are discussed next.

Acknowledging that there are three different storylines within practitioner conceptualisations of resilience leads to the question of how these storylines play out in DRM + resilience practice. We address this question by considering how awareness of the different storylines can contribute to changing DRM + resilience practices. First, the three storylines have their own internal logic based on the emphasis given to different arguments; these arguments can diverge or converge. Bosomworth (2012, p. 153), asserted that convergences, as places of shared meaning, might be used as opportunities to initiate conversation and bring stakeholders together, and from there to collectively expand the discussion to the underlying disagreements. Nevertheless, there may be the tendency, even if stakeholders understand different positions are held by others, to acknowledge difference but not change practice, and therefore, ways of negotiating are required.

Second, the research findings show that each of the three storylines focuses on specific aspects of a policy domain, but these can often contradict one another, for example, the mechanistic/technocratic storyline focuses on solutions based on engineering approaches and the community-based storyline on solutions based on some commitment to or definition of community participation. Nonetheless, these different positions highlighted by the three storylines might create synergies, as they represent different aspects of realities (Gelcich *et al.*, 2005; Hajer, 2000) and all positions contribute to a more complete understanding of a policy issue. In the NDRP case, improving early warning systems for flood (a technocratic approach) could be married with training for community monitoring of flood warning equipment to increase understanding of the metrics being used, and to assist communities to negotiate with government about their local community ability to respond.

Third, even if interviewees are aware of the existence of different perspectives, they may not always be clear on the specific perspectives or only have a notion of the ideas that underpin them. As in other studies (Gelcich *et al.*, 2005; Somorin *et al.*, 2012), the DA conducted in this research could serve as a conduit to enhanced stakeholder awareness of these different positions and to communicating this heterogeneity. DA exposes how these narratives have influenced the design and practices within the scope of the NDRP; and, practitioners may benefit from understanding these different storylines in future development of policy and programmes. (Schön and Rein, 1994) argue that it an awareness of the richness of management approaches that are behind different storylines that leads to reframing. This is especially relevant considering the NDRP is a new and innovative programme. Arguably in embedding "resilience" within the application process, NDRP formulators intended that the resilience approach would provide new ideas and direction; and an opportunity for reflection about theory and management within the DRM policy domain in Queensland. In this paper we now consider exactly this scenario by focusing on different conceptualisations of "bouncing back".

Bouncing back: diverse conceptualisations end in diverse implications

Respondents in all three meta-narratives described deficiencies in contemporary DRM associated with the current focus on response and the need to move to a focus on preparedness. The general convergence was on the need to minimise the negative impacts of disasters, to "bounce back" and to take pressure away from immediate response. The capacity to prepare in order to mitigate and minimise losses, suffering and social disruption is a relevant aspect within the DRM resilience conceptualisation (Bruneau *et al.*, 2003; IPCC, 2012; Mileti, 1999) and to bounce back is a key idea when describing resilience within the DRM literature (Bodin and Wiman, 2004; Mileti, 1999; Timmerman, 1981; Wildavsky, 1985) and was repeatedly mentioned by participants.

We developed Figure 1 to assist in the discussion of the implications of different conceptualisations of the idea of "bouncing back". If bouncing back is understood as being close to the idea of resistance or restoration to what was there before, it could result in similar levels of risk after every disaster. Diagrammatically, we represent this in Figure 1(a) where "resist" or full restoration, is a closed cycle. DRM is frequently represented in the DRM literature as a closed cycle (see e.g. the disaster-management cycle from Wisner and Adams, 2003). We argue that the conceptualisation of DRM as a closed cycle is problematic because the disaster will have changed at least some aspects of the system, making it impossible to go back fully to the former state (Handmer and Hillman, 2004; Paton, 2006). Alternatively, Figure 1(b) depicts "the real

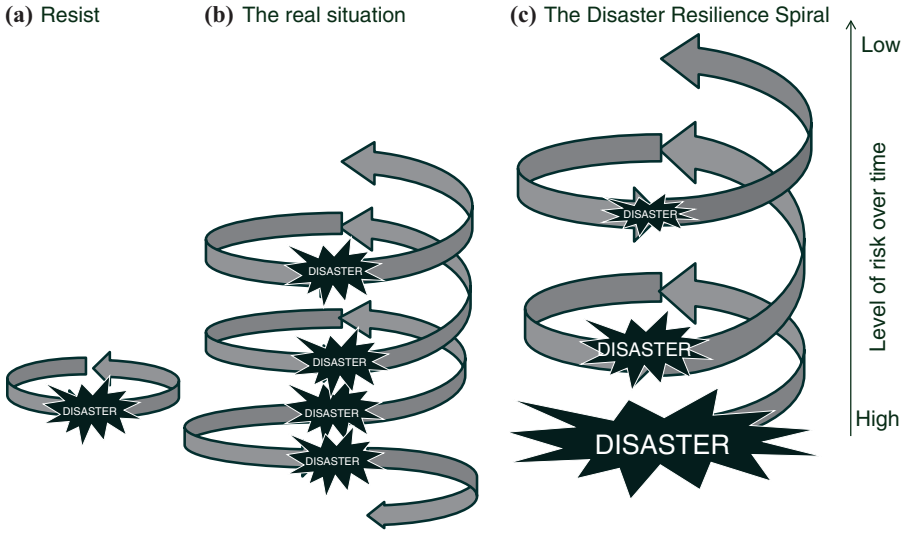

Figure 1.
Alternative conceptualisations of bouncing back

situation", where there is an expectation that measures will be taken to cope and adjust pre- and post-disasters in anticipatory and responsive modes, leading to iteratively decreasing risk (Eriksen *et al.*, 2011). The latter is a parallel idea of the disaster risk reduction approach (DRR). Figure 1(b) represents this idea as an upward spiral, reflecting as a positive interpretation of the real situation. Nevertheless, it is important to recognise that even when well intentioned actions are carried out, very often people are left in a worse situation than before the disaster occurred (Wilhite, 1993), leading to a risk increase in the post-disaster situation, in which cases the spiral drives the system downwards.

Bouncing back can be understood as more than resistance (Adger *et al.*, 2005; Comfort, 1999; Handmer and Dovers, 1996; Manyena, 2006) and the resilience conceptualisation recognises the idea of alternate stable states after an external shock such as a disaster (O'Brien *et al.*, 2010; Walker and Westley, 2011). Disasters then could provide the opportunity to review the management, which would contribute to maximising the efforts achieved in the real situation (Figure 1(b)), or to visualise possible corrections for the system if it was going downwards. In both cases, states containing lower levels of risk are expected. This is represented as "the disaster resilience spiral" in Figure 1(c). Key to this conceptualisation of bouncing back is to frame disasters as opportunities not only to better prepare, to do it better, adapt and be proactive (as pointed out by five interviewees), but also to radically innovate (described by only one interviewee), which is understood as doing it differently, as also argued by O'Brien *et al.* (2010). Nevertheless, in theory it is easier to stress that what should emerge from disasters are opportunities to do things differently, but implementing this in practice is a difficult task, mainly because it challenges power interests and disrupts the status quo. This also runs against a key principle of insurance corporations that insurance payouts should not make people better off as that would create an incentive for loss.

Conclusions

The DA illuminated the different positions (storylines) that actors from this study hold. These not only coincide with popular policy narratives, but also indicate the influence

of the three groups of disciplines that gave origin to resilience theory. Importantly, none of these storylines should be considered as more valid than any other and the presence of diverse storylines provides different perspectives from which to explore a broader set of policy and practice options. Moreover, storyline' statements converge or diverge between storylines and this can be exploited. For example, because people are less likely to resist information that affirms rather than denigrates their frames and values, convergences might be used to initiate conversation and to pave the way for the discussion of the controversial issues. The relevance of discussing divergence is that it gives the opportunity to cast divergences as strengths rather than conflicts. It facilitates reframing, understood as a reflexive and iterative conversation. One expected positive outcome that emerges when reframing occurs is that it allows learning from the heterogeneity of diverse storylines. These diverse views illuminate the difficulties and opportunities in doing things differently and in widening practice and policy options.

One of the most significant lessons that emerged from the findings of this research is perhaps an old one: the relevance of a focus on preparedness, instead of on response and recovery. Nevertheless, even if the importance given to preparedness is not new, what is relatively new within the conceptualisation of disaster resilience is the idea of "bouncing back". The idea of bouncing back can be conceived of in diverse ways, which in turn can lead to the prioritisation of diverse strategies. For the idea of bouncing back to move from being just a slogan to a useful approach, what is required is to give more substance to the meaning of bouncing back and its applicability in practice.

Finally, we note that in the static tradition of bouncing back to where we were before a disaster, the framing is analogous to "resisting" (Figure 1(a)). We argue that this is a narrow conceptualisation that can imply strategies that inconveniently encourage returning to similar states after every disaster, neglecting possibilities for improvement and keeping the system in a negative, potentially "locked-in-trap". By contrast, based on the resilience literature an opportunity to positively exploit the conceptualisation of bouncing back emerges. Resilience theory emphasises that alternative states could follow disasters and this opens a way of thinking about disasters as opportunities to continuously review the management system, and importantly to search for states that could contain lower levels of risk after every disaster. The power of the disaster resilience spiral (Figure 1(c)), is that it captures in a simple way the latter idea and can constitute a possibility of empowering practices and strategies that can follow a spiral moving symbolically upwards. In moving upwards through the spiral, our experience in disasters, indicates that it is important to use the time between disasters as "times of peace" to reflect and to negotiate those important platforms for preparedness.

This study has led to the identification of potential research in this area in order to bridge the gap between theory, policy interpretation, practice and implementation. At the immediate level and of benefit to the NDRP, it is relevant to consider an analysis of the practitioners' evolving discourses. In this way the on-going evolution of ideas and reframing around the value and use of resilience within DRM could be assessed. As well, the opportunity is there for further research on how, once convergences or divergences are identified by practitioners, these occurrences can enable or create barriers to changing on-ground preparation, response and analysis of competencies in relation to "bouncing back" are addressed. It is our experience within this research and elsewhere that the tendency of government to be content with the weaker conceptualisation of "bouncing back" to where we were before, limits the potential for agencies and communities to grasp the seriousness of future scenarios. This situation can limit resourcing as well as the capacity of people to respond.

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