

Title: Post-disaster social recovery: disaster governance lessons learnt from Tropical Cyclone Yasi

Abstract:

Post-disaster social recovery remains the least understood of the disaster phases despite increased risks of extreme events leading to disasters due to climate change. This paper contributes to [advance this](#) knowledge by focusing on the disaster recovery process of the Australian coastal town of Cardwell which was affected by category 4/5 tropical cyclone Yasi in 2011. Drawing on empirical data collected through semi-structured interviews with Cardwell residents post Yasi, it examines issues related to social recovery in the first year of the disaster and two years later. Key findings discuss the role played by community members, volunteers and state actors in Cardwell's post-disaster social recovery, especially with respect to how current disaster risk management trends based on self-reliance and shared responsibility unfolded in the recovery phase. Lessons learnt concerning disaster recovery governance are then extracted to inform policy implementation for disaster risk management to support social recovery and enhance disaster resilience in light of climate change.

Key words: disaster risk reduction, natural hazards, resilience, Australia, self-reliance, shared responsibility

1. Introduction

The risk of climate-related disasters and the economic losses arising from these has been increasing across the world in the last few decades and will continue to do so as a result of climate change and socio-economic development (IPCC, 2012). In the last 20 years, economic losses caused by all types of disasters across the world have amounted to around \$2 trillion, with 64% of economic losses occurring in high-income countries (ODI and CDKN, 2014). The Overseas Development Institute and Climate Knowledge Development Network (2014) suggest that economic losses could reach over \$400 billion a year by 2030. There is also increased recognition that climate change will exacerbate the occurrence of extreme weather events worldwide (Oppenheimer et al., 2014).

Effectively managing and reducing the risks of climate-related disasters is essential but not straightforward. Disaster risk management approaches have evolved significantly since the 1980s from a move away from top-down disaster relief and response measures towards a more comprehensive approach and a greater recognition of the importance of prevention, preparedness planning, training and recovery activities. Additionally, the last decade has seen an increasing focus on the notions of improving resilience to disasters and 'building back better'. This is evident in the Sendai Framework for Disaster Risk Reduction, which includes in its overarching goal the need to implement measures that "prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience" (UNISDR, 2015). The Sendai Framework also indicates that building resilience into policies, plans, programmes and budgets is an urgent task and stresses the use of post-disaster recovery and reconstruction to 'build back better'. It

is also increasingly recognised that investing in disaster resilience can lead to what some have called a 'triple dividend', by avoiding losses, unlocking development potential and through the social, environmental and economic co-benefits of disaster risk management (ODI et al, 2015).

The post-disaster recovery phase is particularly relevant to achieving advanced forms of disaster resilience that enables individuals and communities to better deal with disruptive change (Davidson et al., 2016). Yet, it is one of the least understood of all disaster phases (Berke et al., 1993; Jordan et al., 2016; Lawther, 2016; Rumbach et al., 2016). In particular, it has suffered from an initial focus on the physical reconstruction and restoration aspects of recovery, which resulted in a greater emphasis on hazard response, control and prediction rather than broader recovery (Tierney and Oliver-Smith, 2012). Many scholars argue that post-disaster recovery involves more than the reconstruction of the built environment and frame it as a dynamic and uneven [political and social process](#) (Berke et al., 1993; Nigg, 1995; Tierney and Oliver-Smith, 2012) where technological and social solutions need to be linked (Nakagawa, 2004) [and political decision making processes and dynamics need to be taken into account](#) (Hayward, 2013; Klein, 2007). In taking post-disaster recovery as a social process, scholars call for more attention to be paid to the social, [political](#) and economic contexts in which disasters occur instead of focusing on controlling the hazard itself (Nakagawa, 2004; Tompkins et al., 2008). [Indeed, disaster recovery has suffered just like resilience from a depoliticised approach and a lack of attention to the governance and institutional processes and dynamics at local and national levels](#) (Hayward, 2013). Nevertheless, [despite increased understanding that disaster recovery also requires non-engineering solutions](#) (International Federation of Red Cross and Red Crescent Societies, 2003), the focus on physical reconstruction to the detriment of social recovery is still in evidence today with, for example, the Sendai Framework predominantly setting priorities for response and reconstruction with no clear guidance for [the social aspects of](#) recovery (UNISDR, 2015).

This paper aims to [advance](#) knowledge in disaster [governance and](#) recovery by examining the short and medium-term recovery of the Australian coastal town of Cardwell, [Queensland](#), following the strike of tropical cyclone Yasi in 2011, with a particular focus on [the social aspects of community](#) recovery. We use Smith and Wenger's (2006: 237) definition of disaster recovery as 'the differential process of restoring, rebuilding and reshaping the physical, social, economic and natural environment through pre-event planning and post-event actions'. With its focus on the social component of the post-disaster recovery phase, the paper seeks to inform disaster [recovery](#) beyond the typical hazard reduction and physical reconstruction focus, and argues for the inclusion of improved guidance for [the social aspects of disaster](#) recovery as a part of the trajectory for disaster resilience (Norris et al., 2009). [In doing so the paper does not ignore that much of the social implications that stem from disasters are also rooted in the broader social, political and economic context as well as historical processes](#) (Cutter, 2016; Finch et al., 2010; Klein and Smith, 2008). [Hence, disaster recovery is essentially a social-political process and demands](#) an holistic approach which links recovery structures concerning infrastructure, ecosystems, institutions, economics, and culture (Tierney and Oliver-Smith, 2012). Post-disaster recovery is essentially local [and](#) context dependent (Leonard and Howitt,

2010). It is a complex social-political process whose successfulness is difficult to measure and predict, particularly when multiple physical, biophysical, social and political factors need be considered (Jordan et al., 2016). Hence, there is much to learn about the post-disaster recovery process, especially the social aspects of recovery, in order for it to be improved (Albright and Crow, 2015; Jordan and Javernick-Will, 2013; Olshansky et al., 2006; Tierney and Oliver-Smith, 2012). This paper contributes to this learning by offering empirically drawn lessons from Cardwell's post-disaster recovery during the first two years following Yasi.

2. Background

2.1 Disaster governance in Australia

Australia is particularly exposed to slow and rapid onset natural hazards leading to disasters given its climate, landscape and urban settlements characteristics (Department of Climate Change, 2009; Middelmann, 2007; Serrao-Neumann et al., 2014). As a developed country with significant capacity to respond to natural hazards (Haddad, 2005; Reisinger et al., 2014), Australia has a long history in dealing with disasters that has informed many changes in disaster governance (Blanchi et al., 2014). Disaster management arrangements in Australia have a cooperative character involving multiple levels of governments (federal, state and local) as well as non-government organisations and a significant volunteer-based workforce (Council of Australian Governments, 2011). Arrangements have evolved significantly since the 1980s from a strong focus on response towards a greater recognition of the importance of prevention, preparedness planning, training and recovery activities (Handmer et al., 1999). At the national level, the Council of Australian Governments (COAG) adopted in 2009 a whole-of-nation resilience-based approach to disaster management, which recognised the collective responsibility of all sectors of society in managing disasters. Further to this, the National Disaster Resilience Framework was developed at the end of 2009 and in February 2011 COAG adopted the National Strategy for Disaster Resilience (Council of Australian Governments, 2011).

Operationally, the federal government does not have specific constitutional power in respect of emergency management and its main role is to support the development by the states and territories of a national emergency management capability, and to provide national coordination and resources in cases of major national disasters. The primary responsibility for emergency management falls to the local and state governments, however, local governments have limited competencies and financial resources compared with state government agencies in all disaster phases (Melo Zurita et al., 2015). Additionally, key emergency response and recovery agencies with delegated responsibility for on-ground disaster response and recovery are also largely reliant on volunteers (i.e., rural fire brigade, state emergency services, Australian Red Cross) (McLennan et al., 2016). These agencies are traditionally responsible for disaster response and immediate recovery, but more recently there has been increased expectation for them to play a greater role in disaster preparedness and prevention along with local governments and communities (Melo Zurita et al., 2015).

2.2 Disaster risk management *approaches*

The current Australian disaster management system is based on the 'comprehensive', 'all hazards' and 'all agencies' approach and, following an international trend, the focus on building back better and resilience has been particularly evident in both political and policy rhetoric (Aldunce et al., 2015; Leitch and Bohensky, 2014). The notion of 'building back better', or 'betterment' as it is known in Australia, is included in key disaster management directives both at national and state levels. It is directly mentioned in the Natural Disaster Relief and Recovery arrangements ("Betterment, in relation to an asset, means the restoration or replacement of the asset to a more disaster-resilient standard than its pre-disaster standard." (Australian Government, 2011: 5); and indirectly in the National Principles for Disaster Recovery through the recognition that disaster recovery can provide an opportunity to improve physical, environmental, economic and psychosocial aspects beyond previous conditions (Community and Disability Services & Minister's Advisory Council, n.d.). At the state level, betterment is also defined in the Queensland Strategy for Disaster Resilience as the "process of building back disaster-damaged public infrastructure in a way that makes it more resilience to future natural disasters" (Queensland Government, 2014: 16). What is common in all these references is the association of the concept of betterment with the built environment and infrastructure as opposed to its expanded interpretation to also seek opportunities to improve urban planning policies, social equity and economic development (Kates et al., 2006).

In parallel, the resilience concept also permeates disaster management rhetoric and practice in Australia (McLennan et al., 2016). Priority disaster resilience initiatives are funded through the National Partnership Agreement on Natural Disaster Resilience (Council of Australian Governments, 2011). The Agreement recognises the role of multiple parties in disaster resilience as a collective responsibility, including all levels of government, business, the non-government sector and individuals. In particular, there is increased emphasis on community self-reliance as a key element of disaster resilience based on people's ability to take more responsibility for themselves and decrease reliance on government services (Aldunce et al., 2015; Leadbeater, 2013). Yet, while individuals and communities are being asked to take greater responsibility, this has not necessarily been followed by a transfer of financial resources or the development of skills and capacities at the community and local levels. (Leadbeater, 2013; McLennan and Handmer, 2012). There is also much attention to disaster preparedness to enable better response and strengthen resilience (Leitch and Bohensky, 2014) but understanding about other phases' role in disaster resilience such as the recovery phase lags behind (Aldunce et al., 2015; Camilleri et al., 2009).

3. Methods

This paper examines the post-disaster recovery process of the town of Cardwell, located in Far North Queensland, Australia (Figure 1). Far North Queensland is a region affected by tropical cyclones on a yearly basis with an average of 4.7 cyclones per year and more than 207 known events since records began in 1858 (Australian Bureau of Meteorology, 2016). In early February 2011, category 4/5 Tropical Cyclone Yasi hit Cardwell with wind gusts of up to 285 km/h and a tidal surge of five metres. While the impact of the tidal surge was less intense than expected across the town, the intensity of the storm destroyed homes and infrastructure in the urban area and

caused substantial damage to key industries such as agriculture and tourism (Australian Bureau of Meteorology, 2011). As a result, many members of the community suffered significant personal and financial hardships with insurance losses estimated at AUD\$1.3 billion (Insurance Council of Australia, 2016; Regional Australia Institute, 2013a, 2013b).

[insert figure 1]

The analysis of Cardwell's social recovery draws on empirical data collected over two rounds of semi-structured interviews with Cardwell residents. The first round involving eighteen interviews occurred between August and November 2011 (up to nine months following the disaster) and focused on immediate response and short-term recovery – as the effectiveness of initial post-disaster activities plays a critical role in the social recovery process (Tierney and Oliver-Smith, 2012). The second round totalling twenty two interviews occurred between January and February 2013 (two years after the disaster) and focused on investigating the recovery process two years after the cyclone. Interviewees were purposely selected (Zhang and Wildemuth, 2009) based on their direct involvement through volunteerism with existing community-based groups operating in different sectors (e.g., commerce, environment, tourism, Indigenous, health etc.) at the time of the research. Due to interviewees' availability, only nine informants from the first round of interviews were also interviewed in the second round. A focus group meeting involving four people was held to validate information collected through the second round of interviews. Interviews lasted about one hour, were audio recorded and transcribed verbatim. Transcripts were analysed through in-depth content analysis (Bowen and Bowen, 2008) seeking evidence related to social recovery followed by coding using NVivo software.

Despite the relatively small sample size of informants limiting the potential for generalisation of the findings, views expressed by the interviewees were also held by many in the wider Cardwell community. Indeed, the majority of informants were associated with community-based organisations and during the interviews they reported not only on their personal experiences and feelings but also on others' experiences within their social networks. Additionally, many informants also took part in a parallel action-research project (Reason and Bradbury, 2006) in the two years following the disaster aimed at preparing a strategic action plan seeking to improve their long-term recovery. The project comprised a series of seven full-day workshops with an average of 17 participants each, and two subsequent public meetings involving about 50-60 community members each that validated the future options included in the action plan.

4. Cardwell's social recovery: results and discussion

Key findings can be drawn from interviews concerning Cardwell's recovery with implications for future disaster management initiatives seeking to improve social recovery. Findings are particularly associated with the institutional and social elements of disaster governance, including the role of community members, volunteers and state actors in post-disaster social recovery. To set a context for these findings, a brief overview of the recovery process is presented next.

4.1 Overview of the recovery process

In the aftermath of the disaster, Cardwell was confronted with geographical isolation due to impacts on major infrastructure services such as roads, energy, water supply and treatment, and on food supply. Geographical isolation was not new for Cardwell residents as they often get cut off during the raining season when roads are flooded and access is limited. Based on this previous experience, residents are often prepared to become self-sufficient in terms of food and water supply and energy for several days. Similarly, many had full understanding about the preparation needed in the advent of a cyclone and prepared accordingly for Yasi. For many interviewees however it was the first time they experienced a disaster of the magnitude of Yasi and the implications for their recovery that followed.

Cardwell residents relied on their existing social networks (e.g., neighbours, family and friends) to start their recovery process supported by their pre-disaster preparation and experience in dealing with disasters before official teams were able to reach the location. While communities and individuals are being increasingly asked to take greater responsibility in disaster management, including managing disaster risks to increase their resilience to disasters (Walker et al., 2010), they are not consulted or engaged in the disaster management process, which is led by governments. This discrepancy between those who make decisions regarding disaster planning and management (governments) and those who suffer from the impacts of disasters and have to take the first immediate steps towards disaster recovery, often without much support, can have significant implications. Indeed, it can lead to not only tensions and disagreements between community members and government agencies in the recovery phase, but also to a feeling of powerlessness amongst individuals and a sense of loss of control over their own and the community's problems. This was evident in Cardwell where there was disagreement between community members and officials as to how post-disaster risks were to be managed in the immediate recovery phase in a culture of risk adverse governments. For example, physical access to damaged properties and impacted locations was denied to residents because of the identified risks they posed to citizens and working crews – the last predominantly composed by volunteers that were brought in, many from interstate and without knowledge of local conditions, to assist in the recovery. During this critical time, there were limited opportunities for local residents to convey their local knowledge to working crews to maximise their efficiency on-the-ground and many felt powerless because they could not continue to assist other residents that still required help despite their capacity and willingness to do so.

From a social recovery perspective, a combination of both government and non-government agencies personnel offered assistance to affected residents in terms of immediate financial relief prescribed by legislation as well as psychological support during the first few months following the disaster. Recovery efforts led by local and state government agencies then shifted away from this psychological and social support to concentrate on reconstructing damaged built structures (publicly and privately owned) in the short and mid-term. Notably, in the months that followed the disaster, existing and newly created community groups engaged in activities seeking to restore broader community normalcy (Serrao-Neumann et al., 2013a; Serrao-Neumann et al., 2013b). In particular, there was significant effort to reverse the pre-

disaster economic stagnation of the town which was exacerbated by the disaster (Regional Australia Institute, 2013a, 2013b) - as is often the case (Colten et al., 2008; Olshansky et al., 2006). Despite all reconstruction works and community efforts to speed up recovery, tropical cyclone Yasi inflicted long-lasting impacts on the Cardwell region, with many still suffering the consequences from significant damage five years later (Kim, 2016). This situation, to some extent, reflects the political dimension of disaster management which exacerbates disaster impacts as a result of reduced funds spent on maintaining infrastructure and essential services provided by governments (Klein, 2007). For example, reconstruction works in the town and region brought a contingent of workers that inflated the rental market making it unfordable to many local residents.

4.2 Role of community members in post-disaster social recovery

As outlined earlier, there is an increased focus on community self-reliance in disaster risk management literature and practice to promote greater disaster resilience (Aldunce et al., 2014; Aldunce et al., 2015; Manyena, 2006). The concept of self-reliance is often linked to some form of action non-state actors take to address disaster situations, especially in the preparedness phase (Manyena, 2006). At the individual/household level, this may include preparing and executing disaster plans or acquiring insurance policies. However, there is less clarity as to how community self-reliance plays out during the recovery phase; and the Cardwell example highlights the difficulties that communities face to implement aspects of self-reliance. The Cardwell community faced several barriers in the immediate recovery process, including, official on-the-ground procedures and mandates relating to disaster response and recovery as well as geographical isolation which led to institutional isolation. Indeed, the geographical isolation imposed by Tropical Cyclone Yasi on the Cardwell community meant that residents initiated their recovery process on their own without support from formal government structures as there were reports by interviewees that state actors (official authorities such as police and ambulance officers) left the town in anticipation of the cyclone to protect themselves and their families. This meant that there was no official line of communication between the community and authorities to report on the immediate post-disaster damage and situation. This setting concurs with the literature which identifies members of the community themselves as being the first responders in assisting disaster victims rather than official personnel (Aldrich and Meyer, 2015; Whittaker et al., 2015). Yet, this on-the-ground reality is not recognised within official disaster planning processes.

As first responders, Cardwell residents relied on their existing pre-disaster personal and social networks. For example, there were references to how elements of community cohesion/ spirit were enhanced beyond people's social networks despite the impact caused by the disaster as described below.

No, I think it was – I think it just came out of seeing – when you actually look around and you see people with their houses and that. I think it just – you know, you just go out and help wherever you can and whoever

needed help. (i7, second round of interviews - to protect interviewee's identity codes are used for all quotes)

A pre-requisite for self-reliance in this case may include the nurturing of these networks in the pre-disaster phase, networks which can be re-enforced and/or expanded in the post-disaster phase (Marin et al., 2015; Whittaker et al., 2015). Notably, community self-reliance in the form of social networks may extend beyond the actual geographic location affected by the disaster during the recovery phase. An exemplar of this situation was the Indigenous rangers network programme established at the regional level which was instrumental in the recovery phase.

I think it was just the desire to help their fellow Indigenous Australians in times of disaster. They had the means to do it. They had the desire to do it. So they've done it. They were compelled to come here. Absolutely, from a cultural perspective, they were culturally compelled to come and help us out. They had the means and they had the resources and they want to do it, so they came. I think the relationship that was there between the ranger programmes in the past also supported that." (i14, second round of interviews)

Additionally, community-led initiatives were influential in providing assistance and support to residents in the months that followed the disaster, including after the departure of government-led recovery services from the area.

One of our members has started up a morning tea for anyone who wants to turn up, mainly women, and that's working well because they're all starting to come out of the woodwork now. They talk about it, and any problems they have, they natter about those. (i16, first round of interviews)

Despite the above examples of how social cohesion and networks are important for social recovery, they have been underutilised and under-supported in formal government pre-disaster planning and management (Aldrich and Meyer, 2015). As first responders, more attention needs to be paid to building communities' skill sets to enhance their role in the recovery processes (Vallance and Carlton, 2015), thereby boosting self-reliance. Here, we concur with other scholars (Aldunce et al., 2015; Scolobig et al., 2015) that for self-reliance to be effective in practice the community needs to be better engaged in formal disaster management processes to determine not only their capacity to deal with disasters but also where this capacity requires improvement. This engagement also needs to be supported by legislative frameworks and willingness of authorities and citizens to collaborate in alternative ways (Scolobig et al., 2015). At present, despite the government rhetoric on building communities that are more resilient to disasters, funding for programs that actually contributed to this continue to be absent despite the occurrence of several severe disasters in Australia in recent years (McGowan, 2012).

Furthermore, community-based disaster risk reduction has been identified as a key strategy towards resilience-focused approaches to disaster management (Aldunce et al., 2016; Lawther, 2016; McLennan et al., 2016). This type of strategy is underpinned by co-production of public policy predicated on community participation, ownership and capacity-building; thereby directly related to the notions of self-reliance and shared responsibility. Nonetheless, on-the-ground events in the Cardwell case pointed

to the need for greater attention to promote this type of strategy during the recovery phase to avoid missing opportunities for building local capacity of existing community-based groups.

There's opportunities that we lost in terms of how it was recorded from a local perspective. Pulling that information together because, as I said before, there was lots and lots of meetings and people from outside were gathering information. But we were in this whirlpool. There was no opportunity for us to – because we were responding to everybody else so much, we didn't have our feet on the ground long enough to be able to do our own thing. I think, in retrospect, that there could've been a lot more done in terms of supporting those organisations, [...], that are already here instead of bringing someone in from outside. Giving them the resources to do things. What ended up happening was the resources have gone to out of town. (*fc*, second round of interviews)

As argued by scholars (Aldunce et al., 2016; Leonard and Howitt, 2010), every community recovery is unique and this uniqueness needs to be acknowledged as a source of experiences and knowledge about disasters. In the Cardwell case, many of the interviewees had a significant amount of both knowledge and experience about the uniqueness of their community with respect to addressing disasters, especially in the preparation and response phases. Notably, they were (and still are) learning about their recovery but no formal structures were/are in place to harness this learning and, more importantly, translate it to inform how future disasters are to be managed locally through relevant disaster management plans. [While government policy is pushing for a transfer of responsibility to communities, this has not been supported with a transfer of rights and resources \(including financial ones\), nor with efforts to enhance communities' skills and capabilities \(Aldunce et al., 2015\).](#)

4.3 Role of volunteers in post-disaster social recovery

While disaster management in Australia is primarily the responsibility of government agencies, on-the-ground activities, especially during the response and [long-term](#) recovery phases, are largely carried out by volunteers (McLennan et al., 2016; Melo Zurita et al., 2015; Whittaker et al., 2015). This may include 'formal' volunteers who are part of an emergency services workforce from which they receive special training, are activated upon authorities' request, and therefore act in accordance to set procedures and regulations (Whittaker et al., 2015). Despite the large number of volunteers associated with Australian emergency services (McLennan et al., 2016), response to large scale or widespread disasters can challenge their capacity to provide services (Walker et al., 2010), hence the increased focus on promoting community self-reliance and shared responsibility. For example, Yasi occurred at the tail end of a major flood event that affected the whole State of Queensland (The World Bank and Queensland Reconstruction Authority, 2011), stretching emergency management personnel - mostly composed of volunteers- to the limit. Given the severity and extent of the hazards the assistance provided to the affected community was presented with several shortfalls. In particular, many informants highlighted how

inadequate skill sets compounded by workplace, health and safety regulations limited their ability to assist affected residents as reported below.

Maybe our expectation was too high but you just were of the opinion that the State Emergency people would be well equipped and trained to handle the disaster and what needed to be done. It's not that the will of the individuals wasn't there, but I found that a lot of them had no training or experience whatsoever in helping in things like tarping down people's houses, operating chainsaws to clear away debris off people's properties and then to have access to their properties. (*i6*, first round of interviews)

(McLennan et al., 2016) raise two issues related to how the nature of volunteering is changing in modern times and the implications for the disaster management sector. On the one hand, greater engagement of volunteers in disaster management might include greater community engagement, capacity-building and participation in disaster governance. On the other hand, it represents a reduction in government's responsibility in delivering services as a result of a neoliberal agenda (Cretney, 2014; Welsh, 2014). Either way, the situation is increasing pressure on volunteers to fulfil tasks once performed by government personnel and also doesn't deal with the community expectations about the quality of services provided (Eburn and Dovers, 2015) as observed in the Cardwell example. This pressure is in addition to increased regulation and bureaucracy relevant to volunteerism in the disaster management sector (McLennan et al., 2016). Although informants criticised the inflexibility of government agencies centred on risk adverse policies, local Indigenous rangers skilled in emergency management procedures were able to carry on with on-the-ground recovery works.

There was coordination, some coordination amongst our own ranger programmes. Our ranger coordinator led that – in partnership, of course, with the other coordinators. They'd sit down and work out where each unit was going to go and what they needed and so forth.' (*i14*, second round of interviews)

Additionally, better interaction between volunteer-based recovery agencies and the community could also harness existing local knowledge and benefit from personal networks to improve the quality of services provided.

I was there very early and everyone was coming up talking to me, and I sort of knew everyone's individual circumstances. Then as the teams were setting up I was sort of helping them with the people go through. And then someone – it was actually someone from Red Cross sort of came in and said, like, I had to move along it wasn't my job to do that. But they didn't understand the individual circumstances of what was going on. And they sort of treated everyone like a number. And I could see the whole crowd was getting really quite agitated with that. There was a depersonalisation happening. So I think that there really has to be a local component. I mean, it's great what the community recovery and all of

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those organisations do, but there needs to be a local component within that. (i11, first round of interviews)

Support for residents during the months and years that follow a disaster is often not the subject of attention of disaster risk management efforts (Walker et al., 2010). Affected residents that do not have the skills and knowledge to deal with reconstruction works (including insurers and tradespeople to rebuild their houses) may be left with no support and need to rely on their social networks to make decisions or get assistance (Walker et al., 2010). The examples discussed here point to caveats in social recovery activities deployed by authorities in charge of disaster recovery. Importantly, there needs to be clarity about the roles of different actors in disaster management, especially when shared responsibility is at stake (Melo Zurita et al., 2015). For example, non-government organisations, largely composed by volunteers, are generally responsible for implementing disaster recovery operations, and their contribution to disaster management is likely to increase under climate change (Whittaker et al., 2015). Nonetheless, this contingent of volunteers is not always welcome by authorities due to issues related to public liability (Whittaker et al., 2015). Hence, while there is rhetoric towards community self-reliance for improved disaster resilience, formal institutional structures are unprepared to roll this out in practice. As observed in the Cardell case, the rhetoric/discourse of community self-reliance and responsibility is at odds with existing regulatory frameworks and inherent procedures relating to disaster management. Consequently, when it comes to implementation disaster management is still led by the usual players: government agencies with support from usual non-government organisations and their volunteers, with no adequate provisions to take into account affected communities' knowledge and experience.

4.4 Role of state actors in post-disaster social recovery

Literature notes that a critical challenge for post-disaster recovery is to achieve a balance between quick return to normalcy whilst taking the opportunity to improve pre-disaster conditions (Glavovic and Smith, 2014; Olshansky et al., 2012). Often, time constraint impedes wider engagement of the community and re-enforces the command and control approach deployed to post-disaster recovery by state actors. This trend was confirmed in the post-Yasi case with many criticising the poor engagement of the community in decision-making involving reconstruction works. In particular, interviewees stressed how limited community engagement occurred to determine the location of cyclone shelters throughout the region as well as the rebuilding of the major highway that traverses the town.

I think that should have been handled a hell of a lot better. It was just, again decisions that are taken on behalf of local communities or small communities without consulting the communities first. (i13, second round of interviews)

The above example also illustrates how the lack of flexibility in disaster governance and institutional arrangements result in post-disaster assistance that does not address variation in local needs (Glavovic and Smith, 2014). The lack of community engagement during the post-disaster phase also highlighted the conflicts between priorities perceived by the community and those set by government authorities. The

government's traditional focus on infrastructure remains strong despite growing rhetoric/discourse around betterment and social resilience. As exemplified by the below quote from a Cardwell resident, government agencies still primarily focus on physical reconstruction rather than social recovery.

All I see is all this focus on this highway, there is no money for anything in Cardwell apart from restoring emergency services; there's been no money spent basically on anything except this highway plan. So it looks like all the money is just going to be spent basically on main roads. (i7, first round of interviews)

Despite the trend related to betterment in disaster risk reduction in Australia involving infrastructure projects during the post-disaster recovery phase, this has not happened in practice and opportunities to change regulations have been missed (McGowan, 2012). This situation reflects an international trend in which pre-disaster planning to speed up recovery from natural hazards is neglected despite its recognised importance, including the role of high-quality community-based leadership and institutional capacity (Leonard and Howitt, 2010).

When investigating the role of state actors in the Cardwell recovery process, we noted that it was in line with the [traditional](#) approach to disaster management reported in the literature (Aldunce et al., 2014; Aldunce et al., 2015) - that is, government agencies and practitioners played a central role in implementing recovery activities with limited engagement of the community in decisions. Notably, large scale interventions without the necessary community engagement may in fact compromise communities' social recovery from disasters because they rely on exogenous resources and inputs and reduce the community's internal capacity (Lawther, 2016).

Clearly, there is a direct relationship between self-reliance and shared responsibility and engagement of affected communities in decisions regarding disaster risk management and recovery planning to achieve future resilience (Johnston et al., 2012). This challenges the [traditional](#) approach to disaster management because it requires co-production of services during the recovery phase through collaboration between authorities, volunteers and community members to improve their ability to recover (Vallance, 2015) and become more resilient to disasters (Lorenz, 2013). As noted by (Vallance, 2015) public participation in the recovery phase can be associated with recovery activities addressing substantial issues (e.g., clean ups, promoting social gathering) and/or procedural issues related to decision-making for recovery (e.g., how to go about the recovery). The Cardwell case illustrates that even the first form of participation was not fully supported by authorities once officials reached the location. The second form of participation leading to 'co-production' was totally absent. This situation indicates that the concept of self-reliance and shared responsibility adopted and promoted by authorities are short-lived in the recovery phase and not advanced beyond rhetoric.

Thus, we concur with Vallance and Carlton (2015) that social recovery also implies harnessing the 'participative capacity' of the community, especially if disaster resilience is the ultimate goal of the recovery phase. In particular, the Cardwell case provides evidence that the absence of co-production of solutions (e.g., lack of community input in the reconstruction of the highway) represents a missed opportunity

[to build them back better as well as a hindrance to any form of partnership between state actors and community members in support of self-reliance and shared responsibility. We acknowledge that community engagement in decision-making is not a straightforward process with its own challenges and criticisms \(Ostrom, 2000\). However, in light of the increased rhetoric of community self-reliance and shared-responsibility in disaster management, dismissing the participative capacity of the community in the process serves to retain the status-quo approach to disaster management.](#)

5. Conclusions

In analysing the social recovery process of Cardwell post Yasi, empirically grounded lessons can be drawn with implications for disaster governance and policy implementation for disaster risk management. At the core of these lessons is the concept of self-reliance and shared responsibility and how to operationalize them in practice and, more importantly, during the post-disaster phase.

Firstly, the study showed evidence of community self-reliance in the immediate recovery phase largely [based on](#) residents' personal experience in preparing for and dealing with disasters as well as existing social networks. To increase community's resilience to disaster, efforts to operationalize self-reliance also need to consider the extended recovery phase. This might entail [long-term and](#) continual support for building social networks during the post-disaster [phase extending beyond the immediate recovery phase/timescale.](#) In an age of greater mobility and access to information and communication technologies, social networks need to be considered beyond traditional spatial boundaries as exemplified by the role played by the Indigenous ranger network programme. Importantly, these networks are likely to contribute to disseminate much needed locally based knowledge and experience concerning disaster preparedness as well as recovery; therefore fostering social recovery in the context of the uniqueness of each community. Programmes supporting the strengthening of these social networks may also contribute to building disaster resilience associated with the consolidation of social learning based on experiential learning as observed by Aldunce et al.'s (2015) study.

Secondly, operationalizing self-reliance in the recovery phase requires alternative ways of collaboration between different actors engaged in the recovery process - that is, community members, volunteers and state actors. In particular, our study showed the tension between residents and volunteers deployed by current institutional and disaster governance arrangements to assist in the community recovery. Reports indicated that this tension, to some extent, undermined self-reliance. It also confirmed the confusion about roles and responsibilities at times when decisions and actions need to occur quickly, and how simple prescriptive delegation by governments of responsibility to community members is flawed. Notably, there was little scope for 'spontaneous' volunteers within the community to assist 'formal' volunteers, especially through sharing their local knowledge about the locality and its people. This situation calls for [greater engagement of communities in pre-disaster planning and risk management processes as well as greater communication between communities and government agencies responsible for disaster response and recovery. The](#)

involvement of communities in pre-disaster planning can then facilitate the establishment of credible and trustworthy lines of communication in the post-disaster phase. Improved communication would have the double benefit of: (i) informing 'formal' volunteers of the uniqueness of the place, and (ii) empowering 'spontaneous' volunteers to continue to help their community.

Thirdly, the previous two lessons challenge the traditional approach to disaster risk management which still dominates aspects of the practice in the recovery phase. They do so because they call for greater public engagement in pre-disaster planning as well as post-disaster recovery to support social recovery. Overall, the Cardwell example shows that self-reliance in the recovery phase works well when it concerns substantial issues (e.g., clean up) but lacks acceptance in procedural issues associated with decision-making. This is despite the abundant references to the important role of community engagement in building disaster resilience in the literature and government rhetoric. Self-reliance cannot be implemented without greater community engagement in their own post-disaster recovery. This would allow communities to present their priorities for recovery instead of having the government imposing its own priorities. The Cardwell example clearly highlights the divergence in those priorities with the government's strong emphasis on physical reconstruction with the redevelopment of the highway. A two-way conversation between community and government is needed to ensure that recovery priorities are better aligned to communities' needs. As suggested by Wilson's (2009) observations about the New Orleans' recovery process, an effective community engagement strategy, which produces this two-way conversation and defines community goals, needs and aspirations from disaster recovery, is as important as an investment strategy for disaster recovery to be fully accomplished. Such engagement strategy also needs to deal with issues associated with 'spontaneous' volunteering emerging from community members and opportunities for communication lines to eventuate and enable conveyance of local knowledge to both 'formal' volunteers and state actors.

Lastly, in times of increased threat from climate change impacts, these lessons call for anticipated planning for disaster recovery to ensure shared responsibility is in fact equally shared amongst the different actors. Engaging communities in disaster recovery is not an untroubled or apolitical process. It requires substantial investment of resources and time to deal with the intricacies of engagement per se (e.g., difficulty in mobilising interest, achieving agreed outcomes), rigid local and national policies and bureaucracies (e.g. unwillingness to devolve power to communities, short-term timeframes for disaster recovery), and macro-political decisions that undermine ongoing delivery and maintenance of public services and infrastructure. Nonetheless, proactive and reflexive approaches to disaster governance could harness the opportunity of the current post-disaster phase to seek to mitigate existing negative trends as well as foresee their potential impacts on future community recovery processes. They also could contribute to enact policy and structural reforms related to disaster management activities for both disaster and non-disaster times, especially to clarify roles and responsibilities of the many actors involved in disaster management.

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