



Forced innovation: Business preparedness and recovery after extreme weather events

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About the authors

The Institute for Sustainable Futures (ISF) is an interdisciplinary research and consulting organisation at the University of Technology Sydney. ISF has been setting global benchmarks since 1997 in helping governments, organisations, businesses and communities achieve change towards sustainable futures.

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Executive Summary

This project investigated how small and medium sized businesses (SMEs) prepare for and respond to extreme weather and climate events such as floods and bushfires.

1. Businesses are unprepared for natural disasters

The case studies presented in this report show that the vast majority of businesses are unprepared for natural disasters or extreme weather events. This includes lacking even basic business preparation and redundancy plans. Preparedness is not yet in the business vernacular, in the same way it is for individual households and communities (for example having a bush fire plan). This is despite businesses being essential to the social and economic life of communities, and their continued operations being seen as a key sign of recovery after a natural disaster.

2. Preparedness relies on pre-existing capacities and resources

Business preparedness for and recovery from natural disasters relies heavily on existing qualities and capacities within the firm and connections to knowledge and networks within the local economy. This makes it important to assess preparedness activity and adaptive capacity within the wider context of the knowledge and innovation systems of the region, as this informs and contributes to these existing internal capacities within firms, as well as the strength, composition and coverage of networks encompassing these firms.

3. Impacts are devastating and diverse, and all are not equally well-understood or addressed

The impacts on small business of natural disaster events are diverse and specific to the type of event and pre-existing socio-economic qualities of the business and community. The impact of extreme events can be devastating and disruptive to economic activity. Impacts include business closure, loss of employment, decline and delay in business investment, and stalling of business growth strategies. At a regional economy level this can mean economic downturns, unemployment, and loss of income, vitality and growth in the regional area. Across the four case studies, direct and indirect impacts offered a lens for analysing this diversity.

Direct impacts, such as inundation of business premises, are the most recognisable impacts, and obviously have significant impacts on the affected businesses. Direct impacts are more shocking and emotionally draining for business owners and operators. Direct impacts also bring more immediate assistance from volunteers, local councils and emergency responders, as well as financial assistance; through donations, grants from appeals, and in one case (Lismore floods) eligibility for the Category C \$15,000 recovery grant under the National Disaster Relief and Recovery Arrangements (NDRRA).

Indirect impacts from extreme weather and climate events are as devastating on some small businesses as direct impacts although not always as clearly or quickly evident. In most cases the indirect impacts flow from infrastructure damage or closure, this in turn causing loss of customers for retail, food, beverage and accommodation services that would normally use the closed roads. Longer term, this translated into more permanent changes in customer patterns, as customers got used to shopping in new places, taking

new routes to work/ school etc. Indirect impacts are more difficult to respond to in that the impact is unforeseen, with little previous experience of how and where customer patterns will change.

4. Factors driving preparedness and where are the opportunities for businesses to become more prepared

Much of the empirical evidence on business recovery post natural disasters has focused on how businesses return to “normal” or as they were, not how they use this opportunity to innovate, and build back better with increased preparedness and redundancy for future events. It is for this reason that this project also focused on identifying innovative activity and its characteristics, so as to gather an understanding of the resources and knowledge that enable innovation at such a difficult time.

Experience and financial resources, as well as knowledge (knowing options/ what to do/ how to access to do it), were critical resources needed for small businesses to increase their preparedness. All of these resources really need to be in existence prior to an event, as finding and accessing them in the aftermath of an event is very difficult.

5. Preparedness through building back better

In each of the case studies there were examples of where major infrastructure, buildings, shop premises and offices were damaged or destroyed by (in these cases) flood waters. The vast majority of this infrastructure was rebuilt, although only a fraction to a standard that would make it more resilient to future floods. In the case of buildings and premises damaged in floods, the case studies have shown that building back better requires additional financial and knowledge resources, but also the availability of more resilient building and shop-fit out products and services.

In the few cases where businesses did make significant investments to upgrade the preparedness of their premises there was an additional cost premium of between 20-40% more for the repair/ renovation. For the majority of businesses, this additional financial premium, coming at a time of financial stress, simply rules out building-back better as an option.

6. How insurance contributes to preparedness and recovery

Insurance was raised as an issue in all the case studies. The interview data showed a lack of knowledge of the specific circumstances that insurance policies covered for individual businesses, the situations in which claims could be made and the perception of negative consequences in making claims for businesses in terms of being able to access insurance the future.

The lack of understanding as to what insurance products/ coverage businesses’ have, the circumstances in which they can make claims, and confidence in the transparency and fairness of claim decisions means many businesses do not make proper use of policies they pay for or do not know they are under-insured, and lack confidence in assessing insurance products to cover damage in times of natural disasters. This calls into questions the Productivity Commission’s recommendation that Government withdraws financial assistance from businesses in the event of natural disasters as there are adequate commercial options available.

7. The role of innovation and interaction with regional economic vitality

Innovation is a critical activity in transformational change; the change that means improvement above and beyond, back to normal or business as usual. Innovative activity is evident in the way social networks emerge and/ or strengthen to support recovery, and in actions and changes that individual businesses and business communities make to build back better.

Innovation provides a lens through which to analyse and draw on the existing regional economic characteristics and vitality. In each of the cases the pre-existing strengths and weaknesses of the underlying socio-economic fabric of the community, reflected in the performance, vitality and investment activity of the business community, seemed to underpin the ability of the business community to recover and subsequently thrive. In thinking about adaptive capacity in businesses, particularly small and medium sized businesses, and more broadly of community resilience, we need to understand the impacts of cumulative events, and the extent to which underlying economic and innovation systems determine adaptive capacity.

Contents

Executive Summary	3
1. Introduction	8
1.1 What is innovation?	9
1.2 Innovation and climate change adaptation	9
1.3 Adaptive capacity	11
1.4 About this study	11
2. The Blue Mountains Bush fires October 2013	13
2.1 Regional geography and context	13
2.2 Bushfire event and immediate impacts	13
2.3 Impacts on business community	14
2.4 Thematic analysis	16
2.5 Conclusions	21
3. Lismore Flood 2017	22
3.1 Regional geography and context	22
3.2 Flood event and immediate impact	22
3.3 Impacts on business community	23
3.4 Thematic analysis	24
3.5 Conclusions	29
4. Central West Flood 2016	32
4.1 Regional geography and context	32
4.2 Flood event and immediate impact	33
4.3 Impacts on business community	35
4.4 Thematic analysis	36
4.5 Conclusions	40
5. Picton, Wollondilly Shire, NSW Flood	42
5.1 Regional geography and context	42
5.2 Flood event and immediate impacts	42
5.3 Impacts on business community	44
5.4 Thematic analysis	45
5.5 Conclusions	49

6.	Synthesis and analysis across the four case studies	51
7	Conclusions	59
	References	64

1. Introduction

This project investigates how small and medium sized businesses (SMEs) prepare for and respond to extreme weather and climate events such as flood and bushfires. Increased resilience to natural hazards is a primary adaptation activity for businesses. The impacts of these events can be devastating and highly disruptive to socio-economic activities in the communities that experience these events. These impacts can include business closures, loss of skilled employees and decline and delay in investment in business assets and innovative activities.

Much of the empirical research on business recovery post natural disasters has focused on how businesses return to business-as-usual and the costs and timing of this process. However, the innovation capacity and processes of firms, individually, and as a collective in a business community, are critical in recovery and future preparedness.

Innovation is essential in transformational change; change that means businesses improve on business-as-usual and are made more resilient to a range of future shocks. Critical innovation activities include the galvanising and strengthening of business networks and knowledge exchanges, and accelerating investment in innovations that build business resilience and contingency.

Business and economic resilience planning is not done with the same emphasis as community, or infrastructure recovery, even though the business community is pivotal to post disaster recovery.

This research argues that innovation is a critical input into climate change adaptation. Innovation is not always a planned process but can sometimes be forced upon individuals and businesses as they respond to unexpected events, such as extreme weather and climate related events like floods and bushfires (Smit and Pilifosova 2003). In these instances, preparedness is critical to the capacity of individuals and organisations to adapt (Linnenluecke, Griffiths et al 2012). Preparedness ensures a range of decisions, investments, knowledge gathering activities and networking are in place to support the business in the aftermath of the event. Some of these activities will result in innovation, although these activities will have been done rapidly and without the usual structure and connotation associated with innovation in organisations and businesses.

Three research questions guide the analysis in this report:

- How prepared are businesses for extreme weather and climate events, including details of the types of preparedness activities they undertook, and the resources (both internal and external) they drew upon to complete these preparedness activities?
- What was the impact on the business/ business community of the recent natural disaster event, including short- and longer-term impacts, and less expected and documented impacts?
- What has changed since the disaster event (if anything) to make the business/ business community more prepared for future events, and what enabled these changes?

1.1 What is innovation?

Innovation is the process of “designing and implementing a new or significantly improved product (good or service) or process, new marketing method, or a new organisational method in business practices, workplace organisation or external relations” (OECD 2006 pp8).

The concept of innovation as a process relevant to understanding climate change impacts and adaptation responses has been applied, but in a limited way, restricted to broad concepts of social innovation (Filho 2016 provides a recent exception). In the case of understanding business vulnerability and adaptation to climate change it is a very relevant concept.

Innovation, and innovation system analysis understands innovation as a process of interactions and interactive learning activities between actors (Lundvall 1992). Innovation is therefore an inherently social process and influenced by institutions and geographies that mediate these interactions and learnings. An innovation system is defined as the network of organisations and institutions that develop, diffuse, and use innovations (Markard and Truffer, 2008).

The effect of these institutional and geographical patterns are a range of organisational behaviours, networks and strategies contributing to different scales and depths of innovative activities – innovation processes are uneven, geographically and institutionally, which creates further positive and negative feedback loops. The role of innovation in the wider perspective of socio-economic development is starting to be closely questioned; not the necessity of innovation but the directionality and focus of effort (Leach, Rockstrom et al 2012, Ropke 2012, Weber and Rohracher 2012).

Insights about the role of changing climate in providing stimulus for innovation are only starting to emerge. Research to date has focused on business innovation in addressing emission reduction (e.g. Su and Moaniba 2017), with little analysis of business innovation processes in responding to climate change. Such analysis would include understanding the sources and context for activities and decision-making that sees businesses go beyond coping strategies associated with single-weather related events to grapple with more persistent climate disruption to the business environment.

1.2 Innovation and climate change adaptation

A range of factors influences vulnerability, and subsequent adaptation to climate change: ecological, social, political and economic. Adaptation is the adjustments that humans and nature make, both at an individual and systems level, in response to a particular occurrence or event (Moser 2009). These include adjustments needed to minimise negative consequences, and /or take advantage of any beneficial opportunities (Filho 2016).

The impact of extreme climate events such as bushfires, floods and droughts can be devastating and disruptive to economic activity (Bosomworth, Handmer et al 2008). Economic system losses can be extreme and include business closures, loss of skilled

employees and the decline and delay in investment in business assets (both for replacement and growth) and the stalling of business growth strategies.

Extreme events can also have positive effects in terms of galvanising and strengthening business networks and knowledge exchanges, accelerating innovations that build business resilience and contingency, and highlight clear roles and opportunities for business associations and organisations at a time when it is easier to get the attention of local decision makers and power brokers.

Resilience is a term often used in discussing the impacts and recovery from natural disasters and climate events, but the dimensions of resilience, and what it means and looks like, have not been unpacked for small and medium sized enterprises. In particular, economic resilience is often an aspiration but rarely planned for in the same way that we see social or community resilience supported through formal emergency management and community development responses to natural disasters or climate events.

Resilience in climate change adaptation has its conceptual base in the natural sciences (Holling 1986) and subsequent extension to socio-ecological systems (Walker, Holling et al. 2004). Although definitions vary, resilience is about the strength of a particular ecological system to rebound after an external shock to its pre-disturbance state. Early research into hazards did view natural disasters as more than a biophysical phenomenon that took place in a specific location and time, but rather as a result of social, economic and political contexts (Watts 1983, Blaike, Cannon et al 1994, Oliver-Smith 1996). However, the aim of the research was to investigate how a community recovered from a disturbance to return to a previous state.

Resilience then came to be understood in a more dynamic way; in non-equilibrium terms (Holling 1973); as an integrated socio-ecological system, where the factors shaping resilience are determined by linkages between socio-ecological systems (Anderies, Janssen et al. 2004; Anderies, Walker et al. 2006; Nelson, Adger et al 2007). However, socio-ecological systems, that is human systems that sit within and are constrained by ecological systems and their limits, are characterised by vulnerabilities and spatial unevenness in social and economic inequality. So, whilst the goals of resilience in a conceptual sense include the ability of a system to 'bounce back' after a shock to its former state, in reality if this state was suboptimal, the goal instead should be to use the shock or event as a catalyst for change in the socio-economic system that was already warranted.

For this reason, there is continued debate within the climate change literature about whether resilience is the correct or even adequate term to use in this case (Smith and Stirling 2010). There are also further criticisms that the term lacks the ability to encompass dynamism – that there is switching from one state, to another, and that socio-ecological systems rarely exist in a steady state, but rather should be reviewed as complex adaptive systems following a trajectory of change (Bene, Wood et al. 2012; Leach, Rockstrom et al 2012).

Resilience also needs to be understood in a regional (sub-national) sense; understanding that smaller economic sectors may make small contributions to overall state and national economic development and indicators, but yet within specific localities are

critically important sectors, and affect vulnerability to climatic and non-climatic shocks (Moser 2010).

1.3 Adaptive capacity

Adaptive capacity underpins resilience and provides an opportunity to analyse the dynamics of resilience in different places. Creating adaptive capacity is a process of collective learning, using human capacities and knowledge to reduce vulnerability. Adaptive capacity and innovation are closely related. Innovation is also a process of collective learning and marshalling resources: knowledge, technological and financial. Innovation is also an integral process in creating resilience; it is a process required to identify transformational strategies and provides a framework for communities and businesses to develop learning capacity to operationalise these strategies.

The concept of adaptive capacity sits comfortably within the regional development conception of resilience.

Resilient regions can be thought of as those that seek to develop transformational strategies that anticipate and seek to prepare for the effects of adverse changes, developing the capacity to learn in order to do so and securing the necessary resources to put these proactive strategies into practice (Hudson, 2009, p.22).

In this definition, capacities for regional strategy making and collective learning (including internal and external networks, institutions, leadership, trust and knowledge) are at the forefront. The focus on capabilities also allows for dynamic analysis, as we can see how capabilities manifest and develop over time and space.

This aspect of resilience features strongly in policy discourses around environmental management and sustainable development through the combination of widespread and transformative processes for change developed from the bottom up (for example community energy projects) and catalytic and crisis-induced situations that highlight the need for change from above (Bristow 2010). We use these concepts of adaptive capacity and geographical innovation systems as the analytical framework for the case studies.

1.4 About this study

A central problem in dealing with the implications of extreme events, and one of the motivations for this study, is that the implications and consequences of these events are contingent on other socio-economic variables, and can change over time (Bier, Haimes et al 1999). Therefore, studying impacts, consequences and responses to these events, needs to be a dynamic process that is informed by an understanding of local context. Capabilities and capacity to respond, together with the actual responses at a specific time and in response to a specific event, both need to be analysed.

This report details four case studies of business communities in New South Wales (NSW) that have experienced a natural disaster in recent history (last 5 years). The cases include:

- Blue Mountains: Bushfires of 2013
- Lismore: Flood of 2017

- Central West NSW: Flood of 2016
- Picton: Flood of 2016

The case study sites were selected from a shortlist. The selection processes aimed to provide diversity of geography, and type and characteristics of event, for comparative purposes. The case studies were carried out between October 2015 to November 2018.

Method

Each of the case studies, collected and analysed data derived from both primary and secondary sources. As a first step, relevant documents and media articles were reviewed to provide background and context on the natural hazard event, identify potential interviewees and inform the development of interview questions. A range of in-depth interviews were conducted across the four case studies with businesses affected by the event, relevant economic development and government agencies and business organisations. A snowballing technique was used to elicit further relevant interviewees from the first few interviews. Interview participants were identified as business and community leaders, and /or representative of particular industry sectors.

The interviews were transcribed and analysed across a number of themes including, business impacts of event, preparedness, innovation in response to the impacts of the natural disaster, and the role of institutions, connectivity and networks. The interviews also highlighted further relevant documents, which were similarly analysed using the same themes. In writing up and summarising the case study material, direct quotes from the interviews and reference documents were used.

Structure of the report

The four case studies are detailed in the following sections. Each case begins with a brief write up of background social and economic demographics and geographical context. Then a detailed summary of the extreme events is presented, along with details of the immediate and longer-term impacts on the business community. After this, thematic analysis of issues that emerged from the interviews is discussed. Each case concludes with brief summary of conclusions for the specific case.

Section 6 discusses themes and issues across all the cases, drawing out learnings across all the cases that can be generalised to other disaster preparedness and recovery responses, and inform policy activity in this area. Section 7 provides conclusions and recommendations.

2. The Blue Mountains Bush fires October 2013

2.1 Regional geography and context

The Blue Mountains Local Government area covers 143,000 hectares of land to the west of Sydney. The area is part of the Great Dividing Range, and includes 27 townships, mostly located along the ridgeline (see Figure 1). The vast majority of the land area in the Blue Mountains is part of the Blue Mountains World Heritage National Park (70%), with approximately 11% of land area in private ownership (Blue Mountains Council, 2017). The area has a population of 79,800 people and a workforce of 16,500.

The population growth rate in the Blue Mountains area is lower when compared with other areas of Greater Sydney. According to ABS census data, population growth was 2.5% between 2006 and 2011. Using the Estimated Resident Population data, also from the ABS shows further growth of 1.9% between 2011 and 2016. Although these growth rates are low, any growth has to be contained within the small percentage of land that is not public reserve. The low growth rate means that there has been little new building activity in the region, so most dwellings and buildings were constructed before 2006, when higher standards in the building code for fire protection were introduced.

Gross regional product of the area is estimated at \$2.8billion, the majority of which comes from tourism and associated service activity (BMEE 2017). The area attracts some 3 million tourists each year (NSW Rural Fire Service 2014).

The Blue Mountains is a fire dependent ecosystem; much of the flora within the National Park is dependent on appropriate fire regimes for regeneration and renewal but unmanaged fire has serious impacts on ecological and social systems (Hammill and Tasker 2010). Increasing population growth and urban development within the Blue Mountains means that fire is viewed as an undesirable risk. The Blue Mountains area has had seven major fire events over the past twenty years, although throughout this time small bushfire events have occurred regularly, with yearly variation dependent on seasonal conditions (NSW Rural Fire Service 2014).

2.2 Bushfire event and immediate impacts

During spring 2013 warm, dry weather and strong winds contributed to significant early season bushfire activity across NSW including fires in the Blue Mountains, at Port Stephens, the Central Coast, Hawkesbury and Southern Highlands. On 16 October 2013, a fire (later known as the State Mine fire) broke out near Lithgow. On 17 October 2013, another small fire broke out near Mount York Road, in the Upper Blue Mountains. Later that same day another fire broke out at Linksvie Rd, Springwood in the Lower Blue Mountains (Linksvie Road fire) and quickly spread to the townships of Winmalee and

Yellow Rock. Within three hours the Linksvie Road fire destroyed 195 homes, and damaged a further 146 buildings (ABC News 2013). The fires continued to burn for ten days, and as weather conditions worsened, a state of emergency was declared in the Blue Mountains area on 20 October, and Blue Mountains residents without a bushfire survival plan were advised to leave the area. All schools in the area were closed. The Mount York fire destroyed 10 homes in the Mount Victoria area, and burned for 22 days through 9,383 hectares of land. The State Mine fire, the largest of the three, destroyed some 55,000 hectares of bushland.

2.3 Impacts on business community

The vast majority of property losses as a direct result of the fires were residential. Business and economic impacts of the bushfires were as a result of the disruption to business operations during the 7-10 days around the fire emergency, and in the months following, in continued reduced levels of business, especially in tourism-based businesses. Although the major tourism centres of the Blue Mountains were not affected physically by the fires, a number of factors led to a dramatic reduction in tourist visitors in the aftermath of the fire.

The Blue Mountains has a high proportion of home-based businesses (BMEE 2014), so while actual physical losses were restricted to residential buildings, it is assumed home-based businesses were among those lost.

“There are a lot of people working from home. People are reluctant to admit to authorities that they run a business from home, as they might need to have a DA (Development Application) or permit. So, it makes identifying those businesses afterwards very difficult”.

With the majority of property losses coming in the first day this led to dramatic media footage and reporting of the fires, and the expectation of much worse to come. As one interviewee explained:

“The biggest problem was on day 1, some 200 houses lost so everyone thought this was going to be the biggest disaster ever, no more houses were lost after this, but the seeds were already sown. There was also the fear that the fires would come across to Katoomba and Wentworth Falls, everyone was in a bit of a panic”.

The dramatic nature of the first day of the fire emergency also meant there was significant international media reporting on the fires. Geographically, the settlements over the Blue Mountains are spread over a large area (see Figure 1). The main townships of Katoomba, Leura and Wentworth Falls, and the major tourist attractions (such as Scenic World, Echo Point and the Three Sisters), were well away from the fires.

“The way the fires were reported had a big impact, especially in the international media – they were reporting that the whole Blue Mountains were on fire. There were three separate fires, two were very bad, but they were located in one particular street/ area, but the way the media reported the events it was as if everywhere was on fire and that no one should come anywhere near the Blue Mountains and as a result no one did”.

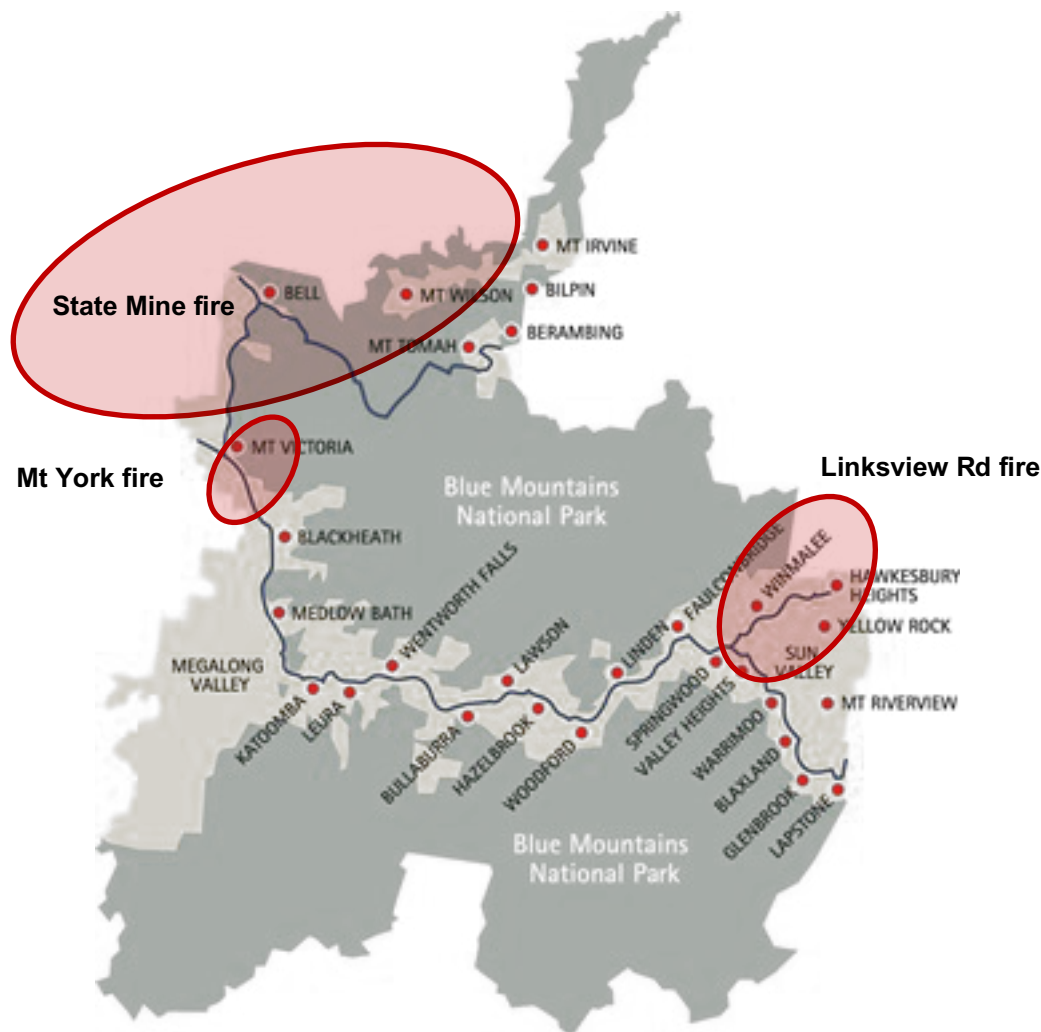


Figure 1: Blue Mountains area with approx. area of the three fires highlighted.

Source: Blue Mountains City Council

The business disruption was both immediate and long term. In the first days of the fires many businesses closed.

“All businesses closed, Carrington Hotel was closed, Bygone Beauties (a retail store and café), an institution up here closed, lots of hotels closed because there were no customers. Even Woolworths had closed, all Leura was closed, even the pub was closed”.

The reporting of the fires both domestically and internationally also led to many prospective tourists to cancel their advanced bookings, even if they were booked for some months into the future. In this case the motivation was not to be out of the way of the emergency services but the thought that the entire area had been affected/damaged by the fires and therefore lost amenity in the eyes of the tourist. One tourism operator explained:

“The day after I had 60 phone calls and they were all people ringing up to cancel their bookings, at the end of the week that the fires started we were down \$50k worth of bookings and after the whole fire incident we were down \$250k in bookings. We had

cancellations call as far away as the Netherlands, cancelling their booking three months out”.

The Blue Mountains Economic Enterprise (BMEE) estimates that the bushfires caused an estimated \$100m in lost revenue in the three months after the fires (BMEE 2014). This represented an estimated loss of 518 jobs, \$24.8m in lost wages and salaries, and \$46.8m in loss of value-added production¹.

Recovery in the business community

In terms of recovery, all of the businesses interviewed for the case study absorbed the losses in custom and associated financial costs. Businesses noticed the downturn well into the following year.

“Very difficult to get tourists to come back, the fires happened in October, but people were cancelling for Christmas. Destination NSW did a promotion for the Mountains as part of the recovery package, but it seemed to have minimal effect. It was not until April of the following year when the Royal couple came up, and that changed things instantly. We had a record Easter and then things got back to normal”.

Many businesses also had to reduce their staffing levels, if not in actual numbers of staff, in the amount of work they could offer staff. As the tourism sector has high levels of casualization – many workers had to look elsewhere for work. Interviewees commented that skilled staff were forced to go into Sydney for work, but when business started to pick up again, staff shortages became a constraint in growing the business.

2.4 Thematic analysis

Innovations

The level of preparedness within the business community was mixed. All businesses interviewed had been through bushfire situations in the past with varying degrees of severity, and many considered the economic impacts of the fires as part of doing business in the area. However, the dramatic and sustained drop in tourist visitor numbers motivated a number of innovations at both the individual business level and the collective business community level. In fact, the most significant changes were at the collective level.

Innovative activities that businesses undertook at the individual level included planning for future natural disasters. Communication plans to reach customers across both digital and media platforms were seen as critical elements of this planning, as the comments from two interviewees below show.

“We now have media management plan to ensure we have accurate reporting on the fire. For example, we try and get the media to report specific street addresses rather than say the whole Blue Mountains”.

¹ The estimates were made using RemPlan software, which takes modeled data from ABS sources and tourism data to model reduced tourist numbers (collected from Blue Mountains Tourism Ltd.) and the flow on impacts to other sectors of the local economy.

“We didn’t have a bushfire plan before, but we do now, afterwards our plans were also to increase communications with our clients, keep them updated if anything happens, be honest but give the facts. We did have another bushfire since, and there was one house lost and we had a conference the next day and they rang us to cancel and I managed to tell them that it was nowhere near, and they did listen to me and continue the conference”.

Other businesses discussed making investments in cloud storage for business administration records, to ensure business records were not vulnerable to damage and loss in future fires, but also to allow the business to continue operating if access to the physical premises was restricted. Other innovations were businesses making investments in increasing their online presence, again to reduce their reliance exclusively on physical customers in their shops. Other businesses discussed diversification strategies to make their business less reliant on one or two revenue streams. For example, one business indicated they had recently opened a microbrewery to develop an additional source of revenue that also has local (repeat) customers as well as tourist customers.

At the collective level, there were a number of activities undertaken to deal with the effects of media reporting of the fires, and the lack of specific local information about the location of the fires in relation to the main tourist areas. This was intended to ensure that the general public further afield did not consider the whole Mountains area to be affected.

The tourism business community came together and organised a conference to discuss this issue and how changes could be made in the future that would ensure both effective emergency management during any fire, but did not lead to the same devastating economic downturn across the whole region.

“We had a one-day conference with all the emergency people, national parks, bushfire brigades, tourism industry and the media and explained to them (the media) how the reporting was so wild and wrong. Some reporting of the fires in the international media were actually fires in WA. We had to explain to the media and the emergency management that yes, we need to warn people and keep everyone safe but that there is a fine line between doing that and frightening people away and killing an industry in the process”

“I think the media understands a lot better the issue now but whether it changes anything, we will have to see next time the fires happen”.

There was also diffusion of existing innovations, a specific example is the *“Fires near me”* mobile app². A number of tourism operators discussed how it was difficult for them to convince customers that the fires were well away from the major tourism destinations. This app provided independent information about where fires were located so tourists could see on a map where the fires were in relation to where they wanted to visit.

“The problem was if the emergency services and fire brigade are saying no, it is a disaster don’t come up, stay away and the tourism industry is saying no, it is fine, come

² The mobile application was developed by the NSW Rural Fire service. The app provides maps and displays fires within a 10km radius of selected destinations.

up, everything is ok, people take a cynical view of us, think we are being selfish or dishonest”.

A further innovation at the collective level was the preparation of economic reports detailing the business impacts of the fires. These reports were available two, six and twelve weeks after the fires occurred. The local economic development agency, Blue Mountains Economic Enterprise (BMEE), mounted a detailed business case for government assistance in the economic downturn. BMEE started work on quantifying the economic impact of the bushfires in the weeks immediately after.

“That was revolutionary – that has never happened (here) before”.

This analysis put BMEE in a good position to lobby for funding to support business recovery. BMEE was successful in receiving three grants but the funding came through 12 months after the fires. Further details of the funding awarded to BMEE for economic recovery is discussed in the following section. However, many businesses described the funding and the projects it went to as having a “profound effect” and being “instrumental in getting businesses to talk to each other and make plans”.

Specific resources within the BMEE, including the CEO’s previous experience in natural disasters (previously worked in Cairns during Cyclone Yasi recovery) and her external networks to both domestic and international economic development expertise in disaster recovery, meant that BMEE and the wider business community were decisive in actions in the early stages after the fire. The economic recovery projects that were funded had already been developed and scoped as part of a four-year strategic planning process run by the BMEE. Advice from external networks to the BMEE on responding to the bushfires was:

“...work with industries, do what makes sense, what is already there, fire up what you were going to do and do it quicker”.

Financial assistance

The availability and the form of assistance particularly financial assistance was a point of contention with all interviewees.

“There was lots of acknowledgement of the financial losses for businesses, but no major efforts to provide assistance. They just saw it as bad luck, you will survive it and get back on your feet”

Three points emerged from discussions with businesses about financial assistance. First, in the immediate aftermath of the fires there was no readily available contact point and coordinated source of information for businesses on recovery assistance.

Within the business community there is a wide held view that there was no assistance available to businesses. Interviews with a business support organisation, however, highlighted that some support was available, including financial support in the form of grants from the NSW Chamber of Commerce. The difficulty was, from the business support agencies’ point of view, identifying and contacting affected businesses to advise them about this support.

There were two main forms of government assistance discussed after the bushfires. Government assistance for business was in two forms:

- Community grants for economic recovery related projects
- Low interest loans

In total the Blue Mountains area received \$1.7m in flexible community recovery grants, half of this was for community recovery and half for economic recovery. There were restrictions on who could apply for these grants; proponents needed to be representative e.g. Peak bodies, or not-for-profit organisations addressing community initiatives. Individual businesses could not apply. Initially there was a \$50k cap on project proposals, but BMEE successfully lobbied to have this increased. Three economic recovery projects were funded.

The projects were:

1. Creative Industries Cluster: \$60,000 funding to support the development of a creative industries branding and positioning strategy for the Blue Mountains.
2. Local Food industry development – workshops and other capacity building activities for local café, restaurants and hospitality enterprises to develop workforce planning and human resource capabilities and develop and strengthen networking activities across the sector.
3. Bushfire planning and building expo – Showcasing best practice and local expertise in building and design for bushfire protection. The expo is over two days, the first day involved industry experts, planning and regulators discussing best practice building in bushfire prone areas. The second day was a community expo of trade products and services that meet the bushfire code, as well as information sessions for the public on insurance, and assessing risk level.

All the businesses interviewed acknowledged the success of these projects. All of these projects are still running, having attracted additional funding and developed further work programmes which provides further verification of success. As mentioned in the previous section, each of these projects had already been scoped and developed with industry and community members as part of the BMEE's strategic planning process. This preparedness allowed the BMEE to accelerate the implementation of the projects when recovery funding became available.

The second form of financial assistance, low interest loans from the Commonwealth and State Government, was proposed, but was never implemented. Low interest loans to small businesses and primary producers are one of the options for financial support under Category B of relief and recovery assistance available under the National Partnership Agreement on Natural Disaster Resilience (COAG 2011). The four categories are briefly outlined below:

Category A - emergency assistance to individuals such as emergency cash payments

Category B - restoration of essential public assets; financial assistance to small businesses, primary producers, voluntary nonprofit bodies and individuals; and 'counter disaster operations' for public health and safety

Category C - community recovery packages and recovery grants to small businesses and primary producers. Funding for BMEE projects was Category C.

Category D - acts of relief or recovery carried out in circumstances deemed to be exceptional

Low interest loans were canvassed as an option by the local business community.

“We did approach our local state member to ask for assistance, and he in turn managed to get some assistance from the Feds, in the form of low interest loans. They said yes, but then it was on again, off again, eventually the federal government said we will give the money but the state government will administer it, and the state government said no we won’t, and so no one got any money. It was a bit like political football. Never found out why the state government did not want to administer the loans. They were both liberal members so it was not a one side versus the other. It would have been better if they just came out and said no, we are not going to help, and then everyone could have stopped thinking about it and get on with life”.

The indecision over low interest loans caused frustration in the business community. There was a feeling that businesses were left waiting, trying to organise paperwork in the hope of accessing the loans. There was also the feeling that there was no coordination from the various levels of government in getting information about what assistance was available, the eligibility for this assistance and the form of assistance.

Low interest loans are rarely used, and for both Commonwealth and State Governments they are very complex and difficult to administer, as well as creating an ongoing relationship between the business and the Government (Productivity Commission 2014). In the recent Productivity Commission inquiry into natural disaster funding in Australia, it was recommended that the Commonwealth Government cease to provide financial assistance to businesses and primary producers altogether, as they found little need for and effectiveness for support i.e. that recovery would not occur without support. The report found that viable businesses could access insurance or credit through commercial institutions. However, they conceded if financial assistance was to continue should be in the form of direct grants, as these are the most transparent and least distortionary mechanism for providing transitional assistance, and easiest to administer (Productivity Commission 2014).

The availability of insurance options was disputed by businesses interviewed in this case study. Business indicated that they did not have insurance cover of any sort that would assist with the financial losses experienced by the fires. A number of interviewees made comments about the availability and terms of insurance in general in the Blue Mountains:

“In the insurance world now the only time it makes sense to make a claim is when you lose everything, we rarely bother making a claim these days – because two things will happen – your premiums will go up, and then the insurance company will start to question whether you are actually a good risk to insure at all”.

“A lot of people have had trouble getting insurance – that has been another by-product of the fires, lots of B&Bs anywhere near trees, or with views of the escarpment had trouble getting insurance after their policies ran out”.

The criticisms around the complexity of low interest loans for government may be valid, as to the Productivity Commission’s assertion that recovery would occur anyway (without the provision of financial assistance), this discounts the importance of assistance to businesses to recover in a timely manner, and in a way, that makes them more resilient to such disruptions in the future. Climate change modelling shows that fire risk and activity will continue to increase in coming years; therefore, mitigating this

risk by ensuring effective recovery and preparedness will be more efficient in the long term.

2.5 Conclusions

The impact of the 2013 Bushfires on the business community was through indirect effects, from loss of tourism resulting from widespread media reporting during the fires, and perception among future tourists of the loss of natural amenity of the area, and therefore its value as a tourist site. This was despite the fires not affecting any of the major tourism sites in the Mountains.

The business community found they had limited options in counteracting this strong perception, and the high dependence on tourism, including international tourism, where communications channels were even harder to influence.

The strategies the business community developed – both collectively as a business community, and individually as business enterprises were targeted at reducing these vulnerabilities to future fire events. At the enterprise level this included basic business continuity planning and activities such as cloud storage and online retailing; improving communications activities, especially through social media, to enable direct communications with customers rather than mediated through the media. Some would say that these changes are not really innovative, but rather sound business practice, and indeed they are, but despite much advice (professional advice) and encouragement – many businesses, particularly small businesses don't undertake these low-cost measures or seriously undertake contingency planning.

Australian businesses have a well-documented history of low management capacity (Commonwealth of Australia, 2009; Agarwal, Green et al., 2011), the impact of which is poor to minimal strategic planning, including contingency planning, and integration and mitigation strategies, investment in new technology and organisational competencies. As this case study shows disaster events can provide a window for businesses, especially small businesses to engage and build their management capabilities, and to develop and implement strategies that improve business continuity and resilience. The collective projects developed and implemented by the BMEE enhanced industry capabilities for strategy making and developed new knowledge, products and markets in key sectors.

As business impacts were indirect in this case, managers and business owners were not coping with recovery in the same way as other events, where business recovery can exhaust any additional management capacity for change and improvement. An area of further study, and one that would support additional investment to ensure businesses make these changes and become more resilient, is determining how having, or enhancing management capabilities in SMEs contributes to adaptive capacity.

3. Lismore Flood 2017

3.1 Regional geography and context

Lismore is a regional town in the Northern Rivers region in the North East of NSW. The City of Lismore Local Government Area covers 1,290km and has a population of 44,054 (ABS, 2016). A region of rich natural beauty, the tourism sector plays a significant role in the local economy, contributing to \$160m annually (NIEIR, 2016). Agriculture is also an integral part of the local identity and economy, with the industry valued at \$76m in 2011, down from \$99m in 2006. Of this sector, livestock slaughtering (36.8%) represents the largest part of the agricultural output value (ABS, 2011). Lismore's Gross Regional Product is estimated at \$2.18 billion. In addition to agriculture (6.3%), healthcare and social assistance services (17.8%), and retail trade (13%) are the dominant sectors of local employment (NIEIR, 2016).

The Northern Rivers district of NSW is one of the most flood prone areas of the Australia outside of the tropics. Lismore in particular experiences significant and regular flooding as it lies at the junction of Leycester Creek and the Wilson River. Although flooding is a fairly regular occurrence in Lismore, the severity of flooding varies significantly. Since records began in 1917, the highest flood levels recorded were in 1954 and 1974, both reaching 12.17m (Bath, 2017). As a prevention measure in 2005, the Lismore City Council constructed a levee wall to 'one in ten year' specifications to protect the central business district against flooding of up to 10.65m. One of the objectives of the levee was to allow businesses and residents in the central areas of Lismore additional time to pack and evacuate in the event of a flood, rather than to stop flooding.

The levee had not been breached until the flood on 31 March 2017. In the weeks prior to the flood the Northern Rivers Region experienced rainfall approximate with just below minor flooding levels. This meant that the ground was already soaked and there was limited ability to absorb the additional rainfall (SES, 2017).

3.2 Flood event and immediate impact

In the days prior to the flood event in Lismore on 31 March 2017, category 4 ex-Tropical Cyclone Debbie hit the coast of SE Queensland. As the storm moved south, it weakened into a low-pressure system, lashing the Northern Rivers region with up to 700mm of rainfall. In Lismore, 324.8 mm of rainfall was recorded in the 18 hours before the flood making it the wettest March day in more than 100 years of records (BoM, 2017). As the rainfall continued to intensify the day prior to the flood, evacuation measures for Lismore were put into place by the SES. The timing of the evacuation order was considered taking into account evacuations after darkness and in heavy rain. Given these concerns, it was decided that all areas of Lismore would be evacuated in one order (SES, 2017). At 4pm on Thursday 30 March 2017, a public Evacuation Order was issued to the Lismore CBD, and north and south Lismore, stating:

“As a result of a revised prediction by the Bureau of Meteorology for the Wilson River at Lismore of 11 metres early Friday morning, the NSW State Emergency Service is directing residents to evacuate immediately. Do not delay your evacuation. Roads will be congested or closed. You could become trapped and need rescue. Remaining in flooded areas is dangerous and may place your life at risk”.

Most local business owners followed the evaluation order and left immediately without having time to move their stock. Many of the CBD owners and residents were angered that evacuation times were not specified for different areas of Lismore. North and South Lismore required immediate evacuation, however many felt time was available for the CBD businesses and residents to be given further time to have raise or remove inventory or belonging before evacuations.

At 4am on the morning of Friday 31 March, approximately 12 hours after the evaluation order was issued, the levee wall was overtopped and the CBD, North and South Lismore and other parts of the city were inundated (Nelson, 2017).

3.3 Impacts on business community

Lismore was declared a Natural Disaster Area on 31 March 2017. While there were no lives lost in the Lismore district, the flood has had devastating impacts on the local community. At least 68% of businesses in the Lismore CBD suffered damage from the flooding and the estimated combined total damage of infrastructure and agriculture in the LGA was just under \$40 million. Only five days after the flood event, the Insurance Council of Australia reported that 1,800 insurance claims overall had been lodged in the Lismore LGA. 90% of these were domestic and the remaining 10% were claims by business – predominantly in the CBD (Nelson, 2017).

In response to the devastating impact on the community, a Flood Recovery Taskforce was created to bring together government, business and community leaders to review recovery efforts, oversee the restoration of Lismore and plan for the future. This taskforce is comprised of key representatives within Council, industry and the Lismore Chamber of Commerce.

According to an independent report commissioned by Lismore City Council to assess the impact of the flood, the psychological impact and mental stress on the small business community has been significant. Much of the stress and anguish was from delays in accessing financial assistance. This includes delays in completing applications and gaining approval of Category C Small Business Recovery Grant³, and perceived slow responses from insurance companies and claims rejections.

³Assistance for severely affected communities, regions or sectors and includes clean-up and recovery grants for small businesses and primary producers and/or the establishment of a Community Recovery Fund. Category C assistance is only made available when the impact of a disaster is severe. It is intended to be in addition to assistance under Categories A and B and is usually considered once the impacts of the disaster on affected communities have been assessed. Category C assistance is requested from the states and requires agreement from the Prime Minister.

3.4 Thematic analysis

Use of local knowledge

Flooding is not a new occurrence in Lismore, there have been several severe inundations in living memory including the 1974 and 1995 floods. Many long-term residents and business owners have significant flood experience and detailed knowledge of interpreting signals (such as river/ water heights in other parts of the catchment) and decision-making experience in strategies for preparedness activities and evacuations.

“If you walk down (to the measurement pole in the main street) at hourly intervals, you could check and gauge how much time you had and when you needed to leave by”

This local knowledge has also resulted in sophisticated physical preparations within business premises for flood, including concrete walls and floors, sloping floors (for the water to run out of the premises), the use of marine carpet, furniture on wheels (so it can be wheel away in trucks and trailers), pulley systems to pull equipment and inventory up to higher floors of buildings, and ceiling hooks and panels that can be used to hang inventory and equipment from the ceiling.

“We were back trading within three days, we have built a sloping floor so the water just runs out, no gyprock, and we don’t have fancy furniture, just put things up on the desk”

The 2017 flood was the first time the Lismore CBD has flooded since the construction of the levee in 1995. The lack of recent flooding experience and no experience of the levee overtopping contributed to a sense of complacency in preparedness infrastructure and investments in business premises and inventory, and preparedness activities in the immediate period before the flood.

“Newer businesses have no experience and no opportunity to have people around them to tell them what to expect. As a result, they suffered loss”

“This is the first time the levee has ever topped, so there was some complacency, some people thinking that this would not happen, also lots of new businesses have moved to town in that period – no experience of the floods – these new businesses did not realise the things already in place to help with flooding – hooks on the roof to pull stock up, no gyprock, things like that...”

“Preparedness knowledge was lost in the new generation, new residents. Connection with other businesses fell away...”

“...the levee had never over topped, some people thought it never would, we all had a false sense of security”

This feeling of complacency and lack of preparedness on the part of some of the businesses was further compounded by the perception that the SES ordered the evacuation of the Lismore CBD too early; and that they did this because they were using modelled and regional level data, rather than specific local data.

“Local knowledge is not been passed on, now it is people in Newcastle looking at computers”

“...Definitely need to look at the communications around the evacuation plans, there was some coordination, but it was not well understood...the BOM announcements were delayed, there were no radio announcements...”

These issues were taken up specifically in a number of the subsequent reviews into the flood. In many interviews, participants discussed the information they received from official channels such as SES and BOM, with what they knew from previous experience, and from friends and family in their networks in surrounding areas. The differing views, and the strength of how these views were held, warrants further discussions in this case study.

A number of Lismore residents and business people, fearing their experiences during and after the floods would not be recounted in institutional reviews (by the emergency services and State Government) authored a citizens’ review of the flood. In this report events from the critical days before the flood are recounted. These days are Wednesday 29 March, Thursday 30 and Friday 31 March 2017. The citizens review noted the following BOM Flood watch and warning announcements and SES evacuation announcements for these days:

Wednesday 29 March 2017

- BOM Floodwatch – forecast rain depression associated with the southward movement of ex-tropical cyclone Debbie.
- 23:21 SES issues evacuation order via Facebook for Lismore South, North and Lismore CBD, later thought this order was for Tweed river.

Thursday 30 March 2017

- BOM Flood watch still in place, heavy falls of 100mm+ expected in the catchment
- ABC radio listeners reporting rain fall of excess 150mm
- Throughout morning residents in Nimbin, Goolmangar and The Channon areas reporting to family and friend’s river heights in their area were heading towards 1974 levels and flood expected in Lismore
- 12:39pm BOM issues minor flood warning – moderate flooding along the Wilsons River
- 13:52 river at Nimbin passes 1974 level
- 15:38 BOM 2nd minor flood warning issued for Wilsons River
- 15:53 BOM 3rd Flood warning – now Major flood warning for Wilsons River
- 16:21 SES Evacuation order for Lismore CBD
- 16:41 Lismore Mayor Facebook post “Major flooding in Lismore tonight, possibly 11m during the night which will not go over the levee, but will flood a lot of places around town. Stay safe!”
- 17:38 SES SMS message to Lismore community “SES Flood Evacuation order. People in low lying parts of North, South and CBD of Lismore must evacuate immediately”

- 18:08 BOM Wilsons river height 6.4m. risen 0.43m in previous hour, 4.2m below overtopping height.

Friday 31 March 2017

- 04:03 levee overtopped and flood waters started entering CBD

“From the issuing of the Wednesday night Evacuation Order up to 12:30 on Thursday afternoon flood information in the lead up to the first Moderate flood warning was limited to two Severe Weather warnings, a General Warning and Sandbag post on the Lismore SES Facebook site. There was no real indication to the community of the severity of the situation” (Citizen’s Review, 2018 pp.6)

Different flood preparedness behaviours and information sourcing

For Lismore businesses that had experience of floods, many chose to stay after the initial SES evacuation order. Evidence gathered from the interviews highlighted that experienced businesses made the case to emergency personnel on why they were staying, what they were doing and when they would leave.

“they let us stay, we were here till midnight packing up and then we left, but they were telling others to leave or they’ll be arrested...”

“we stayed and packed up, we have a plan in place once we have made the decision (to pack up)...I thought everyone would do that, it was only when we were leaving late that night that I realised everyone hadn’t done that...”

“It hard to compare our knowledge to what we were hearing from the BOM, we actually thought it was going to be worse...so we decided to pack up...SES came at 8pm and tried to evict us but we stayed longer...although everyone was starting to worry about what would happen when the levee overtopped, how fast would it come...”

“The missing piece is the local information being passed downstream, the social network, the fence post analysis....the knowledge isn’t gone, it just needs to be accessed”

The move to announcements on social media (SMS, Facebook and Twitter) represented a new method of communication, and not a method that was familiar to most people in an emergency situation. It was noted in the interviews, and also in the Citizen’s Review that radio announcements were the primary method for relaying information in emergency situations, and battery-operated radios would still continue to work when electricity and telecommunications are cut.

Innovations and changes to future preparedness

The level of devastation in the central business district of Lismore meant there were many businesses with total losses and looking at completely rebuilding/ outfitting their premises. Obviously, this is a time for these businesses to make major changes/ investment in the physical assets to enhance future flood preparedness. There were a

small number of businesses that made substantial changes to their premises to increase resilience for future flood events.

“Now things are different, everything is made out of solid concrete, carpet is marine carpet and has two joins, can be ripped up, everything else is on wheels that can be rolled into a trailer, or on these tilting panels, every panel lifts up and hooks into the roof... it would take half a day, with friends to help, to pack everything up”



Figure 2 and 3:
Improvement to shop fit out, including concrete benches, floor, cupboards on wheels, and shelves that clip to the ceiling



The capacity and resources required to make these changes, and in many cases additional investments in rebuilding/ renovating business premises and business processes, cannot be under-estimated. The need to make these decisions also coincides with at a time of immense personal trauma and economic loss. The overwhelming feeling is motivation to return things to as they were, as quickly as possible, rather than think about how things may be done differently in the future.

“a lot of mistakes will be remade next time”

“Some people are already putting gyprock back up”

“If I’d have known this on the Thursday (before the flood) I would have done things differently”

Insurance – storm versus flood event

Insurance was another contested issue. Due to the frequency of flooding events in the Lismore CBD, insurance policies are expensive, and many businesses do not take them out, preferring instead to “self-insure”. The definition of self-insurance differs among business, for some of the more experienced businesses this includes investment in technology and equipment for flood preparedness, contingency planning, and savings for recovery after flooding events. For other businesses, self- insurance means, no insurance and just coping with impacts and recovery after a flood event.

For many businesses in the CBD, the initial damage to their premises and inventory was the result of storm water damage rather than flooding. The storm damage preceded the flooding by some 24 to 36 hours, but this was difficult to prove to insurance companies. Many businesses had storm water clauses in their existing insurance policies, but had great difficulty in proving storm water damage to insurance companies.

“...There was lots of difficulty around insurance, initially this started as a rain event, so storm water flooding into shops, but then turned into a ground flood event...”

“...There was a lot of disbelief with insurance companies when they refused claims, the small business commissioner managed 3 bulk submissions to the insurance ombudsman about how we need to look differently about how insurance claims get assessed in these types of events. (Small Business Commissioner) engaged a hydrologist to show that initial damage was storm event...”

In many cases insurance claims, to some level were paid out, although there was a significant delay. The procedures for insurance claims and category C business grants (discussed further in the following section), often requiring documentation that businesses had lost in the flood diminished available time, human and financial resources further for the business community.

Financial assistance under Category C

The Lismore flood was the first NSW disaster event to make available \$15,000 small business grants, rather than business loans under Category C of the National Disaster Recovery Framework. As the Lismore central business community was eligible for the funding (50% of businesses with more than 75% losses), businesses were able to apply for \$15,000 grant (not loan, as was the case for Blue Mountains and Picton).

“Problem was the slowness of the response”

There was debate among the businesses interviewed as to the effectiveness of the category C funding, and whether it made/ enabled businesses to build back better, or increase resilience to future flooding events (and hence reduce the need to call upon this type of public funding). For many businesses, although the application process was complex and time consuming, the grant allowed them to re-open/ continue to operate, pay staff and replace equipment. They felt there was no emphasis on building back better, no information on how to do this, and even if there was, the \$15,000 amount would be insufficient to allow adequate investments in improvements anyway.

“It should be if you want cat c funding, show me your flood plan, how far did you enact the flood plan? There are no consequences for inaction”.

According to Council figures only a few businesses did not reopen in some form after the flood. The common view among interviewees was that if there was another flood in the next few years, this number would be much larger.

“Businesses are still really hurting financially – it’s not just the flood but other factors. The flood was not well timed, people were already struggling”

Compounding effect of existing economic decline

For many businesses, the flood was an additional negative impact on top of a slower process of economic decline being experienced across the region. This highlights the implications of increasing future climate change impacts on an already stressed, and constrained socio-economic system, and what the compounding effect of these two processes (economic decline and climate change) will be on the community.

“The economic ecosystem is devastated by weather events...need to start costing the path to reduced risk, you will not attract investment unless we do this better”

“there is zero resilience, we don’t have viability, and this is not being addressed into the future”

“weather events are accelerating, impacting already declining regional country towns.

“Floods prevent businesses coming to town, puts investment off, seen as too risky”

3.5 Conclusions

The Lismore case study highlights the effect on a business community of direct impacts of a disaster event – in this case flooding. The majority of business premises in the Lismore CBD were inundated when the levee overtopped on 1 March 2017. This meant all businesses were dealing with disruption, including days lost in preparing and cleaning up after the flood, loss of inventory, damage to premises and equipment, ongoing loss of custom while premises were renovated, disruption to supply chains and customer orders.

Recovery also required completing insurance claims, category C grant applications, as well as other surveys and paperwork to help demonstrate the economic impact of the flood event. As the levee had not overtopped since construction some 20 years ago, there was also the shock and trauma of the event itself, with no previous experience of the levee overtopping there was an enormous sense of trepidation in not knowing what would happen; how fast the water would rise.

There is a long history of flooding in Lismore, at the junction of two river systems the township has experienced 24 major floods (over 9.7m) in the last 100 years, 11 of which would have exceeded the levee height. In terms of flood preparedness, this means there is a very sophisticated knowledge of interpreting river and flood levels and what these mean in terms of flooding in the CBD. For many long-term residents and businesses in the area the amount of rainfall that had fallen in the area over the previous 48 hours prior to the flood, signalled to them that a flood was coming, and there was unease and tension when this personal knowledge did not match, or was not confirmed by, the Bureau of Meteorology (BOM) and other official sources. The first, minor flood warning came some 18 hours before the levee overtopped.

Many experienced businesses openly defied the evacuation order for Lismore and continued to pack their premises, relying on their previous knowledge of how flood levels rose, and estimating they would have enough time. Those businesses who did not have this knowledge and followed the official advice and evacuated at the first evacuation order had little time to prepare their premises and suffered much higher losses. This is not an ideal situation – official announcements being ignored or questioned in favour of local knowledge systems – information that not all can evenly access and verify. For future events it will be critical to bring together both official and modelled forecasts and data at the state and regional level with information and knowledge from the local level, as well enhance the capacity within the community to interpret and understand this knowledge. Reports investigating the aftermath of the flood have all stated the need to enhance the contribution of local voices and knowledge into flood management.

This also goes for preparedness behaviours and activities. As flood is a relatively common event in Lismore, many businesses have specific equipment and organisational routines that allow them to effectively “pack up” their premises. This includes the use of stone walls (no gyprock), sloping floors with concrete and/or marine carpet floor coverings. Shelving, pulley and clip systems that allow inventory to be lifted to higher floors or fastened to the ceiling, out of the flood levels. These physical adaptations of business premises plus organisational routines (knowing how long it takes to pack, method of packing up premises, access to transport etc) mean some businesses were only closed for 2-3 days around the flood.

These types of activities and routines are ideal in an area prone to flood. However, this knowledge is not evenly spread throughout the business community. Diffusion of this knowledge is through experience and social networks and tends to be held with long term residents of the area. Newer businesses, without the experience of flood, or connected into the same social networks that did have flood experience, could not access this knowledge. Although it is another question of whether and how these newer businesses would have used this knowledge if they did have access to it.

The interviews highlighted that many stakeholders believed an opportunity had been lost to use this knowledge to 'build back better' in many premises in Lismore CBD. A key challenge is to provide the resources – information, knowledge, human and financial capital – so that businesses can make decisions/ investments to 'build back better'- when they are required to do so. This is discussed in further detail in Section 6.

4. Central West Flood 2016

4.1 Regional geography and context

The Central West region of New South Wales covers an area of 63,000 square kilometres. The region starts on the west side of the Blue Mountains, at a higher altitude in the Central Tablelands, and extends 500km towards the semi-arid Central West zone. Within the Central West, there are 11 local government areas including; Lithgow, Oberon, Bathurst, Blayney, Orange, Cabonne, Cowra, Weddin, Forbes, Parkes and Lachlan (RDA, 2018).

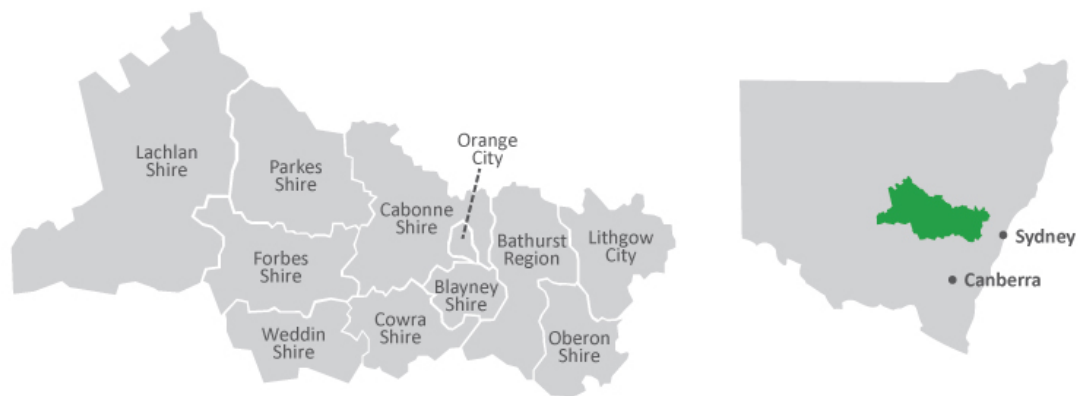


Figure 4: Regional Development Australia: Central West Map

As of the 2017 Estimated Regional Population figures, the Central West has a population of 211,200 people. Population growth from 2016 was estimated at just 1,000 new residents, giving an annual population growth rate of 0.5% (ABS 2018).

At the 2016 census the labour force in the Central West was 91,992. The unemployment rate for the region at census was 6.2%, just below the NSW state average of 6.3% and well below the Australian average of 6.9%.

Key employing sectors include agriculture and public sector services such as education, health and social assistance, as well as food retailing and associated services. Occupational analysis shows the top three occupations as; professionals, managers and tradespeople/ technicians (46.2% in total). This sits below the NSW level for the same occupations (49.8%).

Gross regional production for the Central West is \$1.86 billion, with over 19,000 businesses in operation (ABS, 2015). In recent years there have been a number of

infrastructure projects, including retail, accommodation and airport upgrades, further stimulating economic activity (RDA 2015). Other significant assets within the region include campuses of the regional university, Charles Sturt University (CSU) which both employs and educates numerous personal within the region. Orange, acting as a key service provider within this region, also has many head office and higher order business service activities for the region, State government department offices (e.g. Department of Primary Industries) and specialist health and medical services.

4.2 Flood event and immediate impact

The Central West region is known to encounter floods on an ongoing basis, as rain falls from the Central Tablelands and Great Dividing Range flows down into the valley via the Lachlan River. This can be further compounded by coastal rains from tropical east coast low events, as was the case with the 2016 flood.

The inland flood of Central West NSW began in mid-June 2016, with a series of cold front systems delivering rain across the region, saturating the ground and filling major dams to near capacity. When a further seven cold front systems linked to tropical moisture from Northern Australia brought more persistent rainfall throughout September and October 2016, inland river systems already saturated started to flood (Justice NSW, 2016).



Figure 5: Flood inundation in the Central West

The flood was widespread and affected a significant area of Central NSW; of the seventeen State Emergency Services Regions (SES) in the NSW, this event impacted upon seven of them. During the event the SES received more than 7,700 requests for

help between 30 August 2016 and 12 December 2016 (Justice NSW, 2016). 18 residential properties were impacted, although with minor levels of flooding. The SES carried out a number of swift water vehicle rescues, and there was one instance of loss of life as a result of this event (Justice, 2016).

Overall, large swathes of the Central West experienced severe flooding lasting several weeks, with the main impacts concentrating on infrastructure (particularly road infrastructure), communities (through disruption to day-to-day activities), agriculture and local businesses (RDA, 2016). The Newell Highway, one of the main arterial routes through the Central West and a connecting freight route between Brisbane and the southern states of Victoria and South Australia, was closed between Forbes and West Wyalong for 43 days between 22 September and the 4 November 2016. During this time, major diversions were in place around the flood waters and on to state and local roads.



Figure 6: Floods affecting Forbes township

Although the flood impacted the entire region, the scale of the flood impacts varied in different local government areas. The flood levels within the town of Forbes was the second highest in known history (almost as high as 1952 and higher than 1990 floods). Forbes was cut off by road for many weeks, with the closure of the Newell Highway,

with no way in or out. Floods in the Murray and Edwards rivers were also the highest they had been since 1993 (Justice NSW, 2016). Other areas, such as the Cowra Shire was predominantly unscathed by flood waters, with the impacts restricted to impacts on infrastructure such as roads and bridges.

4.3 Impacts on business community

The region has a long history of inland flooding, with previous significant floods occurring in some LGAs in recent history. As such, significant preparation was in place in order to protect businesses and homes.

“...There was considerable preparation in regard to sand bags, but no levee banks as it moves the water to someone else. Can’t put a levee bank to stop it coming onto your property. You can be prepared with sand bags to protect your house, but you have to watch it go over your crops...”

This flood event had significant impact on agriculture in the region; being a long laying flood, many crops didn’t recover after the flood waters receded with large numbers of landholders reporting 100% losses (Justice NSW, 2016). The impacts on livestock were low due to preparedness activities undertaken by landholders, however there were cascading impacts due to road closures, creating difficulties for accessing markets.

“...getting stock to market was an issue. Getting cattle in, Forbes is one of the biggest sales yards in the area. Instead of going 30-40kms, it was more like 250km to get to the sale yards”.

The economic impact of the 2016 Central West flood on agriculture sector was estimated at \$827m (Justice NSW, 2016, p17). This included damage to crops, pasture, fodder, levees, silos, bridges, fencing, flood gates, cattle, sheep and dairy.

The economic impact of the six-week closure of the Newell Highway was estimated at a further \$112m (NIEIR, 2017). This was calculated through costs associated with the initial detours, which added some 350km, or three and a half hours of travel time, for the journey from Forbes to West Wyalong.

The closure coincided with school holidays, one of the busiest times on the Highway, and there was significant knock on effects to businesses along the highway who rely on highway traffic for custom, or businesses who rely on truck logistics for deliveries via the highway. The highway closure was signposted at the Hume Highway at the Queensland border, and also at the Victorian border. Therefore, the loss of custom from passing traffic affected a much larger area of businesses than the flood affected areas. The Tourist Information Centre at Parkes had a 50% reduction in the number of people registering for information after the floods.

Interview and anecdotal evidence highlight that signposting for the closure/ diversion routes remained visible at the Queensland and Victorian borders for a number of weeks after the road was re-opened. This translated into a slow return of traffic back onto the Newell Hwy, even though the road was only closed for six weeks. The Newell Hwy hotline was receiving queries as to the status of the road some two years after the flood.

Further impacts from the closure of the Newell included the diversion of trucks and repair vehicles onto secondary roads. Road transport was diverted through Cowra. This not only had a negative impact for commuters in Cowra with extensive delays for local traffic, but also for transiting vehicles, as these secondary roads rest stops, and there was more wildlife on these routes resulting in more loss of wildlife. For transport companies and civilians using these routes, there were higher expenses as the roads were not of as high a quality, resulting on more wear and tear on vehicles, as well as more kilometres driven (more fuel) and for Local Government Authorities, more damage to roads (as secondary roads not built to stand the weight and frequency of use as major transit route).

“People that work out of town or on farms, instead of 10-15 mins to work, they were going up around Parkes – 1-2 hours. Although there was no direct flood in Forbes. Change in travel times was a large impact”.

4.4 Thematic analysis

Flow on impacts of the closure of the Newell Highway

The closure of the Newell Highway between Forbes and West Wyalong for six weeks, was identified as one of the main impacts of the floods on businesses in the local area by all stakeholders. The impacts of the road closures were far reaching and varied; impacting freight and logistics movements in and out of the affected towns; flow on effects in economic activity associated with long haul freight along the highway (food retailing and accommodation services); impacting the flow of tourism traffic (associated with school holidays and grey nomads); as well as impacts on local residents travelling to and from work, education, for services etc. The below quotes give some indication of how the road closure affected the business community.

“The Newell was closed for six weeks, these towns are dependent on transport, trucks, the grey nomads, the towns were dead....and it took a while for people to get back to using the Newell after it re-opened...”

“one café shut down, another changed hands, small businesses just can’t cope with the losses...”

Some of the local stakeholders also expressed disappointment at not being involved in the decision-making for the road closure, when the local impacts were so significant. There was an understanding that the Newell Highway is a road of national significance, and most understood the reasoning behind the closure. Nevertheless, many stakeholders discussed the length of time that signage for the closure remained after the road was re-opened, and the lack of local liaison that may have assisted in minimising the impacts of the road closure for local businesses.

“We got one phone call before they closed it, and one phone call before the opened it”

“When talking with them (RMS) it is their way or the highway, no room for discussion...”

In the aftermath of the flood, a number of Councils came together, led by Bland Shire Council to push for the flood proofing of the Newell Highway. The proposal for flood proofing the highway has been on the table for many years and using the calculated economic impact of the closure of the Highway for 6 weeks, and new push was made for state and national government investment in flood-proofing the road.

The report calculated that the total direct gross cost from a national perspective of the closure of the Newell Highway was \$112m. The total impacts in terms of gross regional product loss of between \$138-\$153m, and the equivalent loss of some 2 million hours of work, once the flow-on impacts of lost household consumption expenditure was considered, with the majority of these losses attributed to the Bland and Forbes Shire Council areas (NIEIR 2017).



Figure 7: Flood damage to roads

The Newell Highway has previously been flooded and closed between West Wyalong and Forbes in 1950, 1952, 1956, 1962, 1974, 1983, 1990 for twelve weeks, 2012, and the six weeks in 2016. Arguments have been put forward over this time that the benefit of flood proofing the Newell would outweigh the costs associated with the road upgrade over the life of the road.

Studies by State Government in the early 2000s suggest that a cost-benefit ratio of 1 would not be achieved for the upgrade project, however these studies are unlikely to have considered the impacts of climate change increasing the incidence and severity of flooding events into the future. High level estimates from NIEIR assume the flooding

event of 2016 shifting from a 1 in 20, to a 1 in 15-year probability, calculate a net benefit over the 50-year lifespan of the Highway upgrade of \$0.8bn. (NIEIR 2017).

“(Flood proofing of the Newell Highway) would make a huge difference, it would give the community out here the impression the government is caring enough to invest in infrastructure to ensure Forbes is more resilient in times of flood....It is a vital piece of infrastructure that is treated like a country road....”

The closure of the Newell Highway had a significant impact on local roads. Both heavier vehicles and traffic volumes used these roads as part of diversions, and local road suffered damage from the use. This was on top of, and sometimes compounding water damage from the floods. Local roads are the financial responsibility of local government, and as in many cases budget, and sufficient budget to repair roads is not available with the current financial cycle. Councils need to apply for grant funding to repair roads, this taking time, during which the road further deteriorates. Road repair funding when it does come, only allows the Council to repair the road to as it was previously (replacement) not funding to strengthen the road for future events.

“RMS only lets you build it back to how it was, no improvement, no future proofing...”

“The potholing increased from all the heavy vehicles that had to detour...”

Impact on agricultural production

The floods caused significant impacts on agricultural lands in the Central West, with many farmers declaring 100% crop losses. 145,314 hectares of pasture losses were reported, with heavily affected areas in Forbes, Corinella, Condobolin, and surrounding areas. The flood caused losses to winter crops but also the ability to plant summer crops because paddocks were flooded for such a long period of time. Weed issues increased in the subsequent seasons because of the weed seed movement in the flood waters (LLS media statement 16 Oct 2016).

“...some farmers in the area had sufficient turn over from previous years to get over the flood, others who had experienced previous floods, know the next 2-3 seasons will be good....now we are in drought again, some farmers are looking back and are somewhat grateful for flood...”

Marginal viability of existing business curtailing resilience to extreme events

Many stakeholders spoke of the impacts of compounding events of the continued viability of the small business community. Many primary producers were still carrying high levels of debt from the millennium drought, were impacted by the floods, and now (when interviews were being carried out) were back in drought.

“...We found many local businesses had issues, and a few thought they might have to close. Businesses in a lot of country towns are on the border of making a profit, or not...”

“...You can only stand so much. One on top of the other, compounding factors (flood, drought etc) make it hard to take...”

This is linked to wider issues of economic viability and the ability for regional areas to retain their labour force, particularly creating viable career paths for young people to

remain in the region. Entrepreneurship, and opportunities to start-up businesses linked with agricultural and new applications of technology are viewed as a major opportunity. In general, stakeholders noted that while the number of start-ups was small, they were well networked and there was a strong desire from local institutions to encourage start-ups further, with the availability of individualised business support, grants and mentoring. However, for new business activity to overcome/ reverse declining regions, further and more systematic support and demand would be required, as well as new forms of governance in directing and distributing this support.

“...Putting government offices, forestry services, post offices, that puts infrastructure back in a place, and people come and want to stay and work. Without that infrastructure, it will spiral back down again...People keep a town alive, not money. If you don’t have people in a town, you’ve got nothing”.

“...Challenges aren’t insurmountable but they are systemic, they are not going to be addressed by politics, they need to be addressed by communities...”

Financial Assistance

Many of the agricultural producers in the area qualified for financial assistance under category C after the disaster declaration. This includes recovery grants of up to \$15,000 in addition to the availability of concessional loans and freight subsidies. These grants were approved in December 2016, so relatively soon after the flood waters had receded.

The interviews highlight some difficulties with farmers accessing the funding – particularly completing forms online, with older farmers not universally having internet skills/ computer access to do this.

“...a lot of farmers are older, and don’t all have computer internet skills. I’m 72 and got in early, but a lot of the forms need to be completed online and there isn’t the capacity to get it done (for a lot of farmers)...”

There was also discussion about the mismatch in financial support available to different types of businesses. Agricultural producers were obviously affected by the floods, but their losses have compounding and cascading effects on small businesses within local townships. Financial assistance can help farmers recover some of their losses and replant/ rebuild, but the assistance is never enough to recover the same levels of economic activity in regional towns, and retail and service sectors; sectors that employ large numbers of town people, suffer.

“...Some farmers are getting assistance now for the drought, and back then for the flood, but none for business in town. Forbes is better off than others in the drought, not as bad as they are further north and west, but there will still be businesses that change...I know farmers are small businesses as well. However other small businesses get nothing, seems a bit one sided, but I guess that is a fact of life...”

“...The problem with assistance packages [for drought] the moment it rains, the area is no longer drought declared, the “live support” falls away. The biggest issue becomes cash flow. Very few of the programs look at how to provide cash flow assistance. While the drought is on we can deal with expenditures but doesn’t deal with production. How tenable is the farm and how will it survive if infrastructure goes to ground?”

Within the region, the Lion's Club Australia released funds in the form of vouchers for families and members of the community, including small business owners. These vouchers were for use in local towns only, so that the economic turnover and impact remains in the town. Stakeholders commented on how current forms of drought assistance, such as delivering food hampers to farmers don't come through local shops.

"There was a recent delivery of food hampers to 100 local farmers, but that is 100 families in the area that don't need to go into the local shop or supermarket for a few weeks – that puts great pressure on these small shops, they are just hanging in there..."

The Lion's Club had vouchers available from 5 September 2016 – 31 March 2017. Other than the vouchers from the Lions Club, there was no known government assistance to non-primary producer small businesses in the region. The flooding coincided with busy time of year (e.g. school holidays, and Bathurst races) which usually provides a significant up lift in the café and motel revenue stream. It was estimated that the general motels lost between \$40-80,000 each due to people unable to access these sites (NIEIR 2017). These types of small events in the region, (e.g., food and music festivals etc), have a positive uptick in turn-over for the small businesses in the region over a week to ten days.

4.5 Conclusions

The slow-moving flood in the Central West of NSW in 2016 had both significant direct and indirect impacts on the business communities of the region. Direct impacts included losses in agricultural production with crop losses, losses to agricultural infrastructure (fences, sheds etc) and delays and weed impacts to subsequent crop cycles. Roads were damaged by flood waters (including the Newell Highway), with local roads absorbing more and heavier traffic volumes, accelerating wear and tear on these local roads. There were also impacts in terms of time and increased transport costs associated with long detours.

There were also significant indirect impacts flowing on from the direct impacts; for example, road closures meant loss of custom, disrupted access to transport and deliveries, and changes in retail activity with different commutes, changing consumption patterns. In this last case, changing consumption patterns proved particularly stubborn to returning 'back to normal'.

In comparison with the other case studies presented in this report direct impacts were on primary producers and indirect impacts affecting businesses in the township across the Central West. These impacts were not geographically evenly spread – some areas were negatively affected, others not at all, and some positively (for example diverted traffic from the Newell Highway flowed through Cowra providing additional demand for food and accommodation services).

These variety of impacts again bring into question the suitability and adequacy of government financial assistance in natural disaster events. In this case, interesting comparisons about financial assistance in flood and drought can be made. The case also shows the compounding effects extreme weather events such as floods with other long-term trends – such as demographic shifts, loss of population and skills from regional

areas, and declining employment base in agriculture. The interplay between these trends and climate change will determine regional vulnerability and adaptive capacity in the future.

5. Picton, Wollondilly Shire, NSW Flood 2016

5.1 Regional geography and context

The township of Picton is located in Wollondilly Shire Council, on the south-western fringe of the Sydney Metropolitan area. The Shire spans some 2,500sq km and includes large areas of National Parks and water catchment areas for Sydney main source of drinking water, Warragamba Dam.

The 2017 estimated resident population is just over 51,000. The area has typical demographic features of a peri-urban environment, with overall low population density (0.19 hectare); residential populations clustered in a number of townships, and large amounts of non-residential, agricultural land surrounding these townships. Picton is considered the main centre and is where the Council Chambers and other business and service activities are located.

The Shire itself is set for considerable growth in the coming decades, as the population of Sydney Metropolitan area continues to expand. Population estimates include an additional 30,000-35,000 people in the Shire in the coming decade (Wollondilly 2015).

The Gross Regional Product (GRP) in 2017 was \$1.87b (NIEIR 2017). The main economic sectors of the economy include mining (makes up over 45% of GRP), construction, manufacturing, education and training, and agriculture.

5.2 Flood event and immediate impacts

In early June 2016, an East Coast Low formed off the NSW Coast. The low-pressure system brought heavy rain, strong winds and heavy seas, down the northern coast and ranges, before travelling southwards. Rain persisted over metropolitan Sydney and the south coast throughout Saturday and Sunday (4-5 June 2016). A number of locations recorded their wettest June rain figures in the first week of June (Wollondilly 2016).

In the Sydney Metropolitan area flooding occurred in a number of catchments, including those that drain into the Georges River. Severe coastal erosion occurred in Coogee and Collaroy on the coast of Sydney, and flooding in Western Sydney, where over 330ml of rain fell in twenty-four hours. There were flooding events in Picton and neighbouring Camden.

At 3pm on Saturday 5 June 2016 the main street of Picton (Argyle Street) was inundated by storm and flood water causing significant damage to many business and residential premises.

The flooding in Picton resulted in damage to in the town centre, including the main street; Argyle street and adjacent streets. In the town centre commercial and residential properties experienced serious inundation, with flood waters reaching 1.5m high. The SES conducted over 50 rescues in the Wollondilly area.



Figure 8 and 9: Flooding on Argyle Street, Sunday 6 June 2016.

Source: Wollondilly Advertiser

In post event analysis, results found that the rainfall associated with this June 2016 weather event exceeded the amount predicted for a 1% Annual Exceedance Probability (1 in 100 event) (Wollondilly 2016).

Mr Dave Owens was appointed as the State Recovery Coordinator for the entire East Coast Low event. The recovery areas went from the Northern Coast around Coffs Harbour, and southwards to Sydney and the Illawarra. A total of 41 local government areas including Wollondilly had a natural disaster declaration from this event (Justice NSW, 2016a). In the days after the flooding a Local Recovery Committee was established in Picton.

5.3 Impacts on business community

The major impacts on businesses in the Picton CBD were through flood inundation; 81 of 128 businesses in the town centre were significantly damaged. 90% of businesses had some damage or disruption to operations. 20 homes were inundated, and the St Anthony's Catholic School, located adjacent to the main street had significant water inundation into all areas of the school. The school had to be closed and alternative arrangements made for the students to be bussed each day to another school.

The flood significantly damaged the Broughton Pass on Wilton Road, with the bridge suffering extensive damage with some sections of the bridge wall completely falling away. The small, convict-built bridge crossed the Cataract river, and was the main route between Picton and Appin. Daily traffic on the bridge was estimated at 2,400 vehicles, and its closure created significantly extended travel times for many Wollondilly residents.

The Picton Local Recovery Committee formed on 6 June 2016 and included two taskforces – Broughton Pass Repair taskforce and Picton Economic Recovery Taskforce. A Social Recovery subcommittee was also established to oversee the Mayor's relief fund.

The Wollondilly Recovery Information Point was established on 10 June 2016. The Recovery Information Point was established as an alternate service delivery model, to provide recovery information to the affected community. The Information Point is staffed and maintained by local council and supports access to information about the range of recovery services as well as providing advice and assistance from Council. Included services were: disaster welfare services, human services, Office of Small Business Commissions, Small Biz Connect, Insurance Council of Australia, Telstra Business, SafeWork NSW.

The Small Business Commissioner's advisors engaged with 128 damaged businesses in the CBD to provide guidance about managing cash flow, planning next steps, accessing support schemes and connecting with additional support.

Insurance companies engaged a hydrologist to provide expert opinion on claims in Picton CBD. On 29 June 2016 a number of insurance claim issues arose in respect to damage assessments (Flood vs storm damage), insurers relied on hydrologist reports to accept storm damage claims to 100mm, with damage above this level classified as flood damage. All residential and all but two commercial property claims were accepted (Justice NSW, 2016a)

5.4 Thematic analysis

Impacts of a wide-spread, state wide event

The East Coast Low event that led to the flash flooding in Picton, also caused impacts over a wide area of the state, including coastal erosion in Collaroy and the Northern beaches, impacts to the Coffs Harbour and Marina, and damage to wharves and businesses on the Eden coastline. Natural disaster declarations were in place for 41 different local government areas (LGAs). A second east coast low event impacted NSW seven days later, leading to a situation where there was a significant overlap in response and recovery activities between the two events. This led to a significant demand for emergency services personnel and assets, and in some cases, this meant a delay in collecting data on event impacts, or a lack of data collection at all.

Stakeholders interviewed noted that Picton was not the only impacted area (many also mentioned coastal erosion on the northern beaches) and how this may have, in their view stretched the response and recovery activities in Picton. This included the availability of state and commonwealth agencies to be present, on the ground in Picton, to offer personalised assistance and advice. There was a perception that, as Picton was on the edge of the Sydney Metropolitan area, affected residents and businesses could access services from nearby local centres (such as Centrelink services either from Camden or Campbelltown).

“...because the ECL started up the coast, all the emergency type operations centres were activated up near Lismore etc and like that, so by the time it got to Picton they were all referring to emergency centres up the coast which had not relevance to Picton, which is a bit of an issue with something that big...”

“.... I had nothing but problems when liaising with FACS and Centrelink and everyone else, they did not come on site.... they didn't come down here because they felt we were dealing with it well, and I guess we were, but some of the state government agencies should have been down here. We did look like we were coping alright, but it made it difficult in getting the appropriate resources we needed in here....”

“...We are peri-urban – there tends to be a lot more support when you are rural and regional...”

Disconnect between emergency response and recovery

Stakeholder spoke of a feeling of disconnect between the emergency response and recovery phase, and a feeling of not knowing what to do next in terms of starting recovery.

“...once the combat agencies left, there is sort of like a gap, the police, SES, RFS, they do what they do and they disappear and then there is a big void, and so people just get dropped back off at their house with no assistance from any state or government agencies at all, they are just left to their own devices...”

Following the deluge, we actually had 11 people rescued by the SES, we had one gentleman who was trapped in a tree, but what they didn't do was keep a record of where those people went. So, we were notified of 11 people being rescued and displaced,

but no one knew where they had gone, we thought they were in a local motel, but they weren't, they had actually gone to their families, but we didn't know."

For many businesses, they just wanted to start cleaning up and getting things back up and running, so they could start trading again, but this was not without difficulties, and creating further issues. Many shopkeepers entered their stores when allowed to do so and started disposing of damaged goods out onto the street in an effort to clean up. In one case this included a supermarket, with spoiled/ damaged food products being placed out on the street. This created hazards, including health hazards in the case of food products; issues with insurance claims as it became difficult for insurance assessors to assess quantum of damaged stock; as well as a waste management issue for the local council in picking up and disposing of all the waste in a timely manner.

"...After the deluge as well, the shop keepers just went in and immediately started to clean up and just dump things, without the insurance assessors being in.

"...So there was things like the store down here, well the owner went in there and just started dumping stuff out on the footpath. And then the next thing we know the supermarket around the corner is doing the same, well all the food products were just dumped in the car park, which in itself created a big health issue..."

"... We were very limited in our ability to clean-up, for garbage collection – if it wasn't for the City of Sydney and Camden Councils sending some of their garbage trucks – Sydney sent ten and Camden a couple, if it was not for them who came and assisted us in taking away the garbage we would have been in big trouble..."



Figure 10: Discarded products outside Picton supermarket
Source: Wollondilly Advertiser

Coordinating volunteers and donations

As with many natural disasters, and indeed the other case studies analysed in this report, a wave of people spontaneously volunteering and offering donations (including both money and goods) also quickly became a significant management issue for local authorities. The Picton flood experienced the same with the main street overwhelmed with people wanting to help clean up shops and the street, as well as make donations.

The Council had previously established and constituted a Mayoral Relief Fund, so was able to quickly restart this, and offer to accept cash donations. The local state member of Parliament also set up a relief fund. However, this, together with organising volunteers, waste management and clean up, was the responsibility of the local Council and their staff, who were already operating under extreme conditions, and with deficits in key services, specifically telecommunications.

“...Then we also had 100s of volunteers on our doorstep wanting to help, so we had to try and organise that, because you need to think about safe working conditions and insurance and all of that. And someone had to coordinate them...”

Managing with lack of critical services

The lack of telecommunications and its impacts, especially in the early days of recovery was especially significant. The primary mechanism for getting accurate and up to date information out to affected residents and businesses was through the internet. However, in Picton, as the telephone exchange was also flooded, communications was severely limited. This had the impact of affecting all the banks, eftpos and other electronic financial transactions, as well as mobile and landline telephone and internet services.

“...the exchange up here went underwater so there was no way we could communicate around the area. What did work well was that we had a number of [Council] officers offsite, our communications officer lives in Wollongong, so she was actually posting stuff online onto the web from home...”

This speaks to the need to either ensure that key infrastructure, such as the telephone exchange is flood proofed, or as part of disaster planning for key institutions, such as Council, banks, etc, alternative telecommunications access can be arranged and installed quickly in the event of an emergency.

Flood water and storm water

As with the Lismore case, business insurance around flood insurance was an issue, and again it was the specific definition and assessed impact of storm damage versus flood damage, with the same event having both impacts.

Initial assessment reports from the insurance companies using a hydrologist that was appointed by the insurers, assessed most of the damage to be flood damage not storm. Council, together with the NSW Small Business Commissioner managed discussions with the Insurance Council and commissioned a second hydrology report. These discussions led to a revised assessment that up to 1.1-1.2m of damage assessed as storm water related, with the rest being flood water related. Representatives of the Insurance Council came out to meet with affected businesses on two occasions, and this led to the vast majority of claims being settled with all or partial payouts. There was one case of insurance being refused, and this leading to the closure and sale of one major business in the town.

“...as far as the insurance went, most people were rejected because it was a flood event, not a storm event, or they were only covered for a certain %. One office down here, was rejected for insurance, they are positioned quite high in the town, where there is some levee, so theirs was rain damage, storm water damage, and they weren't covered. You

will see in our main street we still have a number of buildings that are empty because they have been condemned. This is nearly two years after the flood, still waiting for insurance, or didn't get it..."

There were also split incentive effects associated with businesses that rented their premises. From a number of interviews, there were businesses that rented their premises that were not kept up to date with clean up and repair schedules for their premises, or the progress of insurance claims or available assistance. In many cases significant renovations to premises along the main street were required, and so when renovations were complete, businesses found rents were increased.

"...The other thing we found particularly for businesses, people that were renting shops we found were not getting the information that was going to building owners, lots of things about what was happening with insurance. People were renting space weren't privy to when things were going to get cleaned up by the owner....and there were instances of when they did the clean-up and completed renovation work they upped the rent..."

Impacts of Broughton Pass closure

As noted one of the major infrastructure impacts of the flood was the closure of the Broughton Pass. Although this closure did not result in the isolation of any communities, for a small number of people the Broughton Pass was a key piece of transport infrastructure in their daily lives. It connected the townships of Appin and Wilton. The closure resulted in significant addition travel times (up to one hour, for a previous 10-minute journey) for affected vehicles. This was a significant impact on businesses in these two communities, who were otherwise not directly affected by the flood.

"...It severely affected businesses in Wilton and Appin because there was not that flow of traffic of people going from Wilton through Appin to Campbelltown, and Wollongong. Coffee shops closed down, bakeries were affected, the supermarket at Appin was severely impacted on. There was a special unit in Department of Education that kids with a disability would go to this school in Appin, they were affected, Council tried to manage access, but there is only so much you can do..."

In many cases people started to shop elsewhere and returning shopping patterns back to as they were once the Pass opened again was not easy and took a significant time to recover. The scale and pattern of custom for many small businesses is not always evident, and this makes it hard to detect vulnerabilities and mitigate these. These impacts highlight how we think about recovery – the length of time it takes to recover, the scale and form of assistance available, how this is financed, and whether this assistance is sufficient and effective.

"...because once people establish a different pattern of shopping it is really hard to reverse that..."

"...A lot of people didn't realise until a couple of months after the event, the impact on the businesses in Wilton and Appin. There was a doctor in Wilton that people from Appin went to and they then had an hour trip all the way around..."

“...There was a lot of support and assistance in the first couple of weeks and then it tapers off...”

There were significant complexities with the rebuilding of the Broughton Pass, it was a Heritage listed bridge built in the 1800s and was also located in water catchment. All of which required significant studies and specialist advice when considering its reconstruction. The majority of the cost of the bridge had to be sourced from the State Government, and this required a grant process. As in similar instances of infrastructure damage, there are little incentives or cost recovery processes to build back better.

“...It is a heritage bridge in a water catchment...it was built in the 1800s, we were not even sure if it had foundations...”

Impacts on mental health

The mental health impacts of natural disasters are now being widely recognised, including the impacts on the small business community. Many small business owners and workers are facing disruption to their work but also home (if also impacted by the natural disaster), and economic stress in addition to emotional stress associated with the event. This stress is continued over a prolonged period of time, as insurance claims are made and assessed, repairs and renovations undertaken, premises re-opened etc. These events diminish physical as well as financial resources of individuals and groups and can exacerbate existing stressors.

“...one of the other key things for individuals was around their mental health, we had a project called ATAPs, partnership with Health alliance – our attempted suicides went from 6 to 60 in the year after the flood, there was a lot of financial stuff around insurance etc that was really impacted on people...”

5.5 Conclusions

The Picton flood was part of a state-wide storm and flood event. This put enormous strain on both local and state-wide emergency resources and led to a situation where there was an overlap between response and recovery activities. In some cases, this meant a delay in collecting data and initiating recovery activities, or a lack of data collection altogether.

There were major impacts on businesses in the Picton CBD, 81 of 128 businesses in the town centre were significantly damaged. 90% of businesses had some damage or disruption to operations.

For individuals and businesses, the flooding of the telephone exchange and resultant failure of telecommunications had significant impacts, especially in the early days of recovery. The internet was the primary mechanism for sending and receiving accurate and up-to-date information to affected residents and businesses; telecommunications were severely limited in the first few days. This affected all the banks, eftpos and other electronic financial transactions, as well as mobile and landline telephone services. Further investment in making this infrastructure more flood resistant would enhance the resilience of Wollondilly.

As with the Lismore case, business insurance around flood insurance was an issue again. It was the specific definition and assessed impact of storm damage versus flood damage, with the same event having both impacts.

Similar to the Central West case study, due to the closure of major road infrastructure (the closure of the Broughton Pass) had a significant impact on businesses (in Appin and Wilton) who were not directly affected by the floods. It also added additional travel times to journeys and changed shopping patterns across the townships.

The negative mental health impacts on many small business owners and workers cannot be under-estimated. During a time of natural disasters, there are often multiple properties facing damage (business and home), the emotional and economic stress over long period of time as insurance claims are made and assessed and reconstruction and renovation begins, all whilst the business is trying to re-establish supply chain and customer relationships. In each of the cases, the stress of these events, often compounding existing stressors, results in deteriorating mental health. Adequate and accessible mental health services are a critical component of long-term business and the wider community recovery.

Finally, the rapid population growth and new development activity that is forecast for the Wollondilly area in the coming decade means that there will need to be an emphasis on sharing flood knowledge and preparedness practice with new residents and business owners. Establishing who will facilitate this process and how it will be resourced needs to be considered in the wider development plans for the area.

6. Synthesis and analysis across the four case studies

The previous sections have detailed the results of the four case studies, as individual and separate events. This section compares and contrasts the cases, as a way to provide a synthesis and identify some more generalisable findings.

6.1 SME business preparedness for natural disasters is weak

In general, the case studies showed that the business community's knowledge about how to prepare for natural disasters, such as knowledge of specific actions that can be taken to prevent inventory losses and minimise damage and trading loss as a result of floods, was uneven.

This unevenness occurred because in each case there were a few businesses that were experienced and had sophisticated preparedness activities in place when needed and were therefore able to quickly recover afterwards. In each case there were a number of businesses that were unprepared, but as a result of experiencing the event, invested in knowledge and assets to prepare for future events.

The vast majority of businesses in each case, were underprepared, lacking even basic business preparation and redundancy plans, felt overwhelmed by the impacts of the event on their business, and their recovery was financially, physically and emotionally draining. Many commented that they could not go through a similar event again.

Preparedness is not yet in the business vernacular, in the same way it is for individual households and communities (for example having a bush fire plan). This is despite businesses being essential to the social and economic life of communities, and their continued operations being seen as a key sign of recovery after a natural disaster. Small and medium sized businesses have mixed levels of knowledge and preparedness for business continuity risks from natural disasters; with most SMEs having little to no specific preparedness for natural disasters (Sharpe, Jacobs et al 2017).

Business preparedness for and recovery from natural disasters relies heavily on existing qualities and capacities within the firm (Linnenluecke and Griffith 2010) and connections to knowledge and networks within the local economy (Sharpe, Jacobs et al 2017). This makes it important to assess preparedness activity and adaptive capacity within the wider context of the knowledge and innovation systems of the region, as this informs and contributes to these existing internal capacities within firms, as well as the strength, composition and coverage of networks encompassing these firms.

6.2 Direct versus indirect impacts of disaster events

In the four case studies presented, SMEs suffered a range of direct impacts (damage to premises with flood water inundation) and indirect impacts (loss of custom from reduced foot or transport traffic due to road closures, or adverse media coverage).

Obviously, direct impacts such as inundation of business premises significantly affect the business. Although in cases where businesses have a high level of preparedness, such as was the case for a number of businesses in Lismore, then there can be a large degree of variation in the level of impact, and also the speed and resource intensity of recovery. Some highly prepared businesses in Lismore were open and trading three days after the flood-water receded. Other businesses took months to reopen and even longer to recover.

Direct impacts are more shocking and emotionally draining for business owners and operators. In a very short period of time following a natural disaster there are a lot of things that need to be done – clean up, insurance claims, decisions about repairs and renovations, as well as managing staff and customer expectations.

6.3 Assistance: volunteering and financial assistance

Direct impacts also bring more immediate assistance from volunteers, local councils and emergency responders, as well as financial assistance; through donations, grants from appeals, and in one case (Lismore floods), eligibility for the Category C \$15,000 recovery grant under the National Disaster Relief and Recovery Arrangements.

The distribution of assistance either through volunteers, donations or grants requires organisation and management. The cases showed that there was no standard way of doing this. In Picton, volunteers and donations of money were channelled through the Mayoral Relief Fund and managed by Council. In Lismore, volunteers formed an organisation “Helping Hands” to coordinate volunteers, as well as donations of food, clothing and other equipment. This organisation, managed through social network platforms, continues today. In the Central West, the Lions Club had an existing grants program (initially for drought relief) that they could amend and use in the aftermath of the floods. In most cases financial relief was targeted at individuals, rather than small businesses – but rules were ‘relaxed’ to enable SME’s to apply and benefit.

6.4 Assistance: Evolution of Category C⁴ concessional loans and grants for SMEs

The case of the Category C Recovery Grants shows how public policy around recovery is evolving. For the Blue Mountains bush fires these were \$15,000 concessional loans (under Category B) and could only be accessed if certain criteria were met. These loans were approved by the Australian Government but were to be administered by the NSW Government. The NSW Government did not want the responsibility of administering the loans, and what would effectively be a credit relationship for a number of years with small businesses in the Blue Mountains who took up the loans. This meant that impacted SMEs had no options for financial assistance in the immediate or medium term to alleviate these impacts.

⁴ Recovery assistance is funded via a partnership between the Commonwealth and State Governments, and is organised into four categories:

Category A - emergency assistance to individuals such as emergency cash payments;

Category B - restoration of essential public assets; financial assistance to small businesses, primary producers, voluntary nonprofit bodies and individuals; and ‘counter disaster operations’ for public health and safety

Category C - community recovery packages and recovery grants to small businesses and primary producers.

Category D - acts of relief or recovery carried out in circumstances deemed to be exceptional

The option of concessional loans was not pursued in either the Central West or Picton floods. In the Central West \$15,000 grants, also under Category C, were available to agricultural producers, but not other types of businesses.

In the 2014 Productivity Commission inquiry into natural disaster funding in Australia recommended that the Australian Government cease to provide financial assistance to businesses and primary producers altogether. The Productivity Commission asserted that in most cases that business recovery would occur without support, and viable businesses could access insurance or credit through commercial institutions and commercial product offerings. However, they conceded if financial assistance was to continue it should be in the form of direct grants, as these are the most transparent and least distortionary mechanism for providing transitional assistance, and easiest to administer (Productivity Commission 2014).

When the Lismore flood occurred in March 2017, the need for financial assistance for affected businesses in the Lismore CBD was obvious, and the rules around concessional loans were changed from loans to grants. The application process was still rigorous, requiring financial documentation from each business. Opinions were varied as to how onerous the process was; some businesses felt the application forms were too complex and difficult to complete in a timely manner and added to the stress of recovery. Others felt they were appropriate, and the information was easily accessed from accountants etc. This may reflect the size and professionalization of the businesses involved; in that Business Activity Statements (BAS) needed to be up-to-date, for some businesses this was the case, for others not.

6.5 Unexpected indirect impacts

Indirect impacts from extreme weather and climate events are as devastating on some small businesses as direct impacts, although not always as clearly or quickly evident. Indirect impacts were experienced in all the cases but dominated impacts on small businesses in the Blue Mountains, the Central West, and adjacent communities to Picton. In most cases the indirect impacts flow from infrastructure damage or closure – the closure of the Newell Highway between Forbes and West Wyalong in the Central West, and the closure of the Broughton Pass between Picton and Appin/Wilton in the Wollondilly Shire. The impacts include loss of customers for retail, food, beverage and accommodation services that would normally use the closed roads. Longer term, this translated into more permanent changes in customer patterns, as customers got used to shopping in new places, taking new routes to work/ school etc.

In the case of the Blue Mountains, indirect impacts were the result of extensive media coverage, including international media reporting of the bush fires, and the perception that the fires had significantly damaged the amenity of the entire Blue Mountains as a tourist attraction.

Indirect impacts are more difficult to respond to in that the impact is unforeseen, with little previous experience of how and where customer patterns will change. There are no response tasks to be completed – no clean ups, insurance claims etc. They are also difficult to counteract, and this contributes to a sense of helplessness. In the Blue Mountains case, interviewees said they needed a correspondingly big event – the visit of the Royal couple, in order to sufficiently recover. The length of time the Newell Highway

was closed (and signposted as closed) and the lack of any specific, large events meant recovery in the Central West was slow, although it is difficult to be definitive about this, as there are no reliable, regular regional level business and economic data sources. Potential impacts can be modelled from scaled down national sources, but this is likely to be conservative (as it will only include high level national industry data) and with significant error margins. So, when considering recovery and the adaptive capacity of business communities, there are few avenues for evaluating and assessing impacts.

6.6 Issues with insurance in the definition of flood damage and storm damage

Insurance was raised as an issue in all the case studies. In all the cases, interview data showed a lack of knowledge of the specific circumstances that insurance policies covered for individual businesses, the situations in which claims could be made and the perception of negative consequences in making claims for businesses in the future. In the Blue Mountains case, none of the businesses interviewed made insurance claims to cover their losses. Many believed that you only made claims if you absolutely had to, and this would lead to increased insurance policy costs in the future, and the possibility that insurance (for bush fires) would not be offered.

It was a similar situation in the Central West, with small businesses affected by the Newell Highway closure not making claims for their losses. One interviewee mentioned anecdotally that another business, with business continuity insurance, had made a claim, but this could not be verified.

In Picton and Lismore, the issue was the definition of flood water and storm water damage. In both cases, the event started as a storm event (East Coast Low in Picton, and ex-tropical cyclone rain depression in Lismore). Significant rainfall in the first hours of the event caused damage to premises, but so too did the flood waters that arrived afterwards. In both cases, many businesses had insurance cover for storm water damage but not flood water damage, so assessing what damage was caused by storm as opposed to floods was critical for many claims.

In both cases initial hydrology reports commissioned by insurers led to a majority of claims being ruled as flood damage and therefore not covered by insurance policies. Subsequent, independent hydrology reports, organised with the assistance of the NSW Small Business Commissioner, established levels or percentages of damage associated with storm damage, and therefore ensured some level of payout of claims on policies with storm damage provisions.

For many interviewees in Lismore and Picton, the perceived lack of transparency around decision-making for storm versus flood damage was concerning, with many commenting that these decisions should be independent of insurance companies as they had vested interested in particular outcomes. This perception also contributed to a general feeling of insurance claim payouts being unpredictable – that it depended on what insurance company you were with and whether they wanted to make a public statement with insurance claims. For example, a number of interviewees in Lismore commented that one particular insurance company paid out on all claims because *“they wanted the good PR”*.

The lack of understanding as to what insurance products/ coverage businesses' have, the circumstances in which they can make claims, and confidence in the transparency and fairness of claim decisions means many businesses do not make proper use of policies they pay for or do not know they are under-insured, and lack confidence in assessing insurance products to cover damage in times of natural disasters. This calls into question the Productivity Commission's recommendation that Government withdraw financial assistance from business in the event of natural disasters as there are adequate commercial options available.

It should be noted that insurance companies/ Insurance Council were not part of the data collection for this project. It is possible they would have counter views to many of the issues raised here. However, that the perception, if not the reality, in all cases exists as uncovered in this report, alone warrants further investigations/ analysis to understand the impact, and also how insurance could provide incentives for preparedness and support adaptive capacity.

6.7 Ability to build back infrastructure better – and funding to do so

In each of the case studies there were examples of where major infrastructure, buildings and shop premises and offices were damaged or destroyed by (in these cases) flood waters. The vast majority of this infrastructure was rebuilt, although only a fraction to a standard that would make it more resilient to future floods. Why is this the case?

In the case of major road assets (such as the Newell Highway, major state and local roads, and the Broughton Pass Bridge in Picton) funding is provided only to re-build the asset to the same standard as previously. If the asset is managed by local government (as in the case of Broughton Pass and many of the roads damaged in the Central West flood) councils have to go through a lengthy and detailed grants submission process, with funds not being available until 12-18 months later. During this time the asset is unusable or deteriorates further. Roads such as the Newell Highway are repaired more quickly, because of their national significance, but again not in a way that makes them robust to similar situations (and therefore avoids similar negative impacts for business communities) in the future.

In the case of buildings and premises damaged in floods, the case studies have shown that building back better requires additional financial and knowledge resources, but also the availability of more adapted building and shop-fit out products and services. In the few cases where businesses did make significant investments to upgrade the preparedness of their premises there was an additional cost premium of between 20-40% more for the repair/ renovation. However, for the majority of businesses the additional price premium at a time of financial constraint simply precludes building-back better.

Further, assuming the financial resources exist, the business owner needs to know what to do, what actions, infrastructure, and equipment exist to better adapt their premises. They also need access to these resources quickly, as decisions for repairs and renovations need to be made quickly. Related to this issue, is having access to tradespeople, suppliers, and equipment manufacturers able to advise, install and make these changes. This knowledge can be quite specialised and not easily available. Availability of financial resources, while critically important in encouraging investment in building back better, will not alone ensure this. Developing and communicating

knowledge around preparedness options for premises and enhancing skills of tradespeople who operate in these areas with this knowledge will also be essential.

6.8 Compounding impacts of multiple events on economic resilience of the towns/ communities

In each of the cases investigated for this report, the extreme weather event was treated in isolation from other events that have happened previously and since. Understanding the cumulative effect of these events, with other climatic events and regional drivers of socio-economic and demographic change, is what will really get to the heart of determining community resilience and the adaptive capacity of small businesses.

In each of the cases the pre-existing strengths and weaknesses in the underlying socio-economic fabric of the community, reflected in the performance, vitality and investment activity of the business community underpinned the ability of the business community to recover and subsequently thrive. In the Blue Mountains case this was clear, the business community had already established strategies for development, business community leaders were in place and could successfully lobby for resources to enact these strategies in the aftermath of the fires, and the small business community collectively and individually made investments of time and resources (human and financial) to leverage these strategies.

Similar recovery strategies were developed and implemented in Picton and Lismore, although they were developed after the events. Because of this lag in the development of recovery strategies, the capacity and capability of the local economic and innovation system was more limited. In the Central West, the affected areas were geographically large, and encompassed more than one economic and innovation system. Geographical breadth can dilute the ability for such local strategy making, as happened in the Blue Mountains. The cumulative impact of previous droughts, the decline in the agricultural industry, as well as the service reductions/ closures (of both public and private services) in many small, regional towns means that there is limited underlying adaptive capacity in these communities to recover.

In thinking about adaptive capacity in SMEs, and more broadly of community resilience, we need to understand the impacts of cumulative events, and the extent to which underlying economic and innovation systems determine adaptive capacity.

6.9 Codifying preparedness knowledge for business branches and franchisees

In the two cases where there were direct impacts on the Central Business Districts; Lismore and Picton, there were many examples of branches, franchises and offices of large corporate businesses that were severely affected by the floods and had little to no preparation for what in both cases were regular and foreseeable disaster events. This included banks, insurance company offices, and major retail chains. Not only were these premises unprepared for the event, they were slow to recover, including clean up, shop renovations and re-opening. Furthermore, when shops were renovated and reopened there was little evidence that the premises were better adapted to future events. For example, gyprock and carpeting were not replaced with materials better suited to inundation by flood water.

Large, well-resourced businesses can direct their internal capacity and resources of their head officers to enhance preparedness in their branches and franchisees. This would be of long-term benefit to the company, chain or franchise, as well as providing an opportunity for these businesses to become examples of best practice for other adjacent, smaller and less resourced businesses, such that knowledge spillovers and transfers about best practices could be generated.

6.10 The role of innovation

In the introduction section to this report innovation is highlighted as a critical activity in transformational change; the change that means improvement above and beyond back to normal or business as usual. Innovative activity is evident in the way social networks emerge and strengthen to support recovery, in actions and changes that individual businesses and business communities make to build back better. For example, in the Blue Mountains, tourist operators came together to organise a conference with media outlets to discuss how unspecific media reporting impacts on business activity in the entire region and to jointly develop actions to mitigate this in the future; in Lismore, one business store owner completely redesigned and refitted his shop, drawing on local knowledge of specific mitigation techniques, and combining these with his own knowledge of shop fit outs and carpentry, to ensure his business is highly prepared and minimally affected by the next flood in Lismore. These examples represent transformative adaptation in the local business community.

There were also examples of innovation in local governance; in the Blue Mountains the Blue Mountains Economic Enterprise (BMEE) lobbied for and coordinated grant funding to support business recovery (the first known example of Category C Community grants being used in such a way). This lobbying was based on detailed economic impact data, also commissioned and collected by the BMEE, so the scale of downturn in economic activity in the Mountains was clearly evidenced. One business interviewee described this as “revolutionary, this has never happened before (in all the previous fire events)”.

In the Central West, similar action occurred with three Councils coming together, led by Bland Shire Council, to commission data on the economic impact of the closure of the Newell Highway, as a way to provide further evidence to State and Federal Governments about the long-term benefits of flood proofing the Newell Highway.

The cases have also shown innovation in State and Local Government responses to natural disasters; through the evolution of surveys and data collection to calculate business impacts, the changes to financial assistance through Category C of the National Disaster Relief and Recovery Arrangements, with concessional loans shifting to grants, during the span of the case studies analysed for this report. Whether this has translated into increased future preparedness and resilience in recipient SMEs is still to be answered.

In each of these examples, the innovative activity has drawn upon an existing capacity and resource within the community, whether specific knowledge, skills, and/ or networks that have allowed the business or business community to respond in a specific way to the opportunity (need for recovery). This is adaptive capacity – the capacity within the business or business community for collective learning, using knowledge, and marshalling resources to innovate. Understanding how adaptive capacity develops, is

retained and can be enhanced will be essential in understanding resilience in small businesses, business communities and communities.

7 Conclusions

This project investigated how small and medium sized businesses (SMEs) prepare for and respond to extreme weather and climate events such as floods and bushfires. The research aimed to uncover:

- How prepared businesses were for extreme weather and climate events, including details of the types of preparedness activities they undertook, and the resources (both internal and external) they drew upon to complete these preparedness activities?
- What was the impact of the recent natural disaster event they experienced, including short- and longer-term impacts, and less expected and well documented impacts?
- What has changed since the disaster event (if anything) to make them more prepared for future events, and what enabled these changes?

1. Business are unprepared for natural disasters

The case studies show that the vast majority of businesses are unprepared for natural disasters or extreme weather events. This includes lacking even basic business preparation and redundancy plans. Preparedness is not yet in the business vernacular; in the same way it is for individual households and communities. This is despite businesses being essential to the social and economic life of communities, and their continued operations being seen as a key sign of recovery after a natural disaster.

Business community recovery, has not until recently, been addressed in planning and policy as specifically and as needed. Efforts are now emerging, and knowledge and understanding of what represents effective business community recovery after a natural disaster is nascent. This is despite the fact that business recovery, particularly SMEs, are critically important in overall community recovery.

Recommendation 1: Enhance the emerging focus on SME and business community recovery in disaster response and recovery policy and activities, including analysis of options and identifying best practice for business community revitalisation after such an event.

2. Preparedness relies on pre-existing capacities and resources

Business preparedness for and recovery from natural disasters relies heavily on existing qualities and capacities within the firm (Linnenluecke and Griffith 2010) and connections to knowledge and networks within the local economy (Sharpe, Jacobs et al 2017). This makes it important to assess preparedness activity and adaptive capacity within the wider context of the knowledge and innovation systems of the region, as this informs and contributes to these existing internal capacities within firms, as well as the strength, composition and coverage of networks encompassing these firms.

3. Impacts are devastating and diverse, and all are not equally well-understood or addressed

The impacts on small business of natural disaster events are diverse and specific to the type of event and pre-existing socio-economic qualities of the business and community. The impact of extreme events can be devastating and disruptive to economic activity (Bosomworth et al 2008). Impacts include business closure, loss of employment, decline and delay in business investment, and stalling of business growth strategies. At a regional economy level this can mean economic downturns, unemployment, and loss of income, vitality and growth in the regional area. Across the four case studies, direct and indirect impacts offered on lens for analysing this diversity.

Direct impacts, such as inundation of business premises are the most recognisable impacts, and obviously have significantly impacts the affected businesses. Direct impacts are more shocking and emotionally draining for business owners and operators. In a very short period of time there are a lot of things that need to be done – clean up, insurance claims, decisions about repairs and renovations, as well as managing staff and customer expectations.

Direct impacts also bring more immediate assistance from volunteers, local councils and emergency responders, as well as financial assistance; through donations, grants from appeals, and in one case – Lismore, eligibility for the Category C \$15,000 recovery grant under the national Disaster and Resilience Framework.

Indirect impacts from extreme weather and climate events were as devastating on some small businesses as direct impacts although not always as clearly or quickly evident. In most cases the indirect impacts flowed from infrastructure damage or closure, this in turn causing loss of customers for retail, food, beverage and accommodation services that would normally use the closed roads. Longer term, this translated into more permanent changing in customer patterns, as customers got used to shopping in new places, taking new routes to work/ school etc.

Indirect impacts are more difficult to respond to in that the impact is unforeseen, with little previous experience of how and where customer patterns will change. There are no response tasks to be completed – no clean ups, insurance claims etc. They are also difficult to counter act, and this contributes to a sense of helplessness.

Recommendation 2: Develop and trial methodologies to better account for and address indirect impacts, as well as understand and communicate options/ best practice for revitalising shopping patterns/ customer patterns from indirect impacts.

Recommendation 3: Consider how the financial assistance currently provided addresses the impacts to small businesses of these events, and determine whether this is adequate in amount, form of assistance, length of time, and how it interacts with both direct and indirect impacts. The recent changes to the Category C \$15,000 small business concessional loan program to a grant program provides an opportunity to assess how financial assistance does or does not assist in recovery and/ or future preparedness and identify what additional assistance is required.

4. Factors driving preparedness and where are the opportunities for businesses to become more prepared

Much of the empirical evidence on business recovery post natural disasters has focused on how businesses return to “normal” or as they were, not how they use this opportunity to innovate, and build back better with increased preparedness and redundancy for future events. It is for this reason that this project also focused on identifying innovative activity and its characteristics, so as to gather an understanding of the resources and knowledge that enable innovation at such a difficult time.

Experience, financial resources as well as knowledge (knowing options/ what to do/ who to access to do it) are critical resources needed for small businesses to increase their preparedness. All of these resources really need to be existing, as finding and accessing them in the aftermath of an event is very difficult.

Recommendation 4: Map and understand the points of change, or thresholds that trigger changes in SMEs and allow them to make more adapted choices, and then have the information, products and services available for these times.

5. Preparedness through building back better

In each of the case studies there were examples of where major infrastructure, buildings and shop premises and offices were damaged or destroyed by (in these cases) flood waters. The vast majority of this infrastructure was rebuilt, although only a fraction to a standard that would make it more resilient to future floods.

In the case of buildings and premises damaged in floods, the case studies have shown that building back better requires additional financial and knowledge resources, but also the availability of more resilient building and shop-fit out products and services. In the few cases where businesses did make significant investments to upgrade the preparedness of their premises there was an additional cost premium of between 20-40% more for the repair/ renovation. Although for many businesses this additional cost premium, coming at a time of financial constraint, rules out building-back better.

Even assuming the financial resources exist, the business owner need to know what to do, what actions, infrastructure, equipment etc exists to make their premises more resilient. They also need access to it quickly, as decisions for repairs and renovations need to be made quickly. Related to this, is having access to tradespeople, suppliers, equipment manufacturers who are able to advise, install and make these changes. This knowledge can be quite specialised and not easily available. Availability of financial resources, while critically important in encouraging investment in building back better, will not alone ensure this. Developing and communicating knowledge around preparedness options for premises and enhancing skills of tradespeople who operate in these areas, with this knowledge will also be essential.

Recommendation 5: Analyse and propose opportunities and mechanisms that allow for infrastructure to be re-built to higher standards and taking into consideration future climate projections, for example through the Building Code and improved design and materials standards.

Recommendation 6: Assess supply chain capability in providing better adapted building and shop fit out services and equipment. Also engage with stakeholders to ensure

adequate training and service provision exists in communities so that these services and products are available and can be installed in the event of re-building/ renovation.

6. How insurance contributes to preparedness and recovery

Insurance was raised as an issue in many ways across all the case studies. In all the cases interview data showed a lack of knowledge of the specific circumstances that insurance policies covered for individual businesses, the situations in which claims could be made and the perception of negative consequences in making claims for businesses in the future. In Picton and Lismore, the issue was the definition between flood water and storm water damage and the perceived lack of transparency in the decision-making on the type of event. In all cases this left many businesses with the perception that insurance claims and payouts were unpredictable, and therefore could not be relied upon.

The lack of understanding as to what insurance products/ coverage businesses' have, the circumstances in which they can make claims, confidence in the transparency and fairness of claim decisions means many businesses are paying for policies they don't use properly or are under-insured and don't know it, and lack confidence in identifying insurance products to meet their needs.

Recommendation 7: Work with relevant stakeholders to increase small businesses knowledge and ability to assess and accurately purchase the type of insurance they need, understand what they need to do in the event of making a claim (for example requirements for plain English policies).

Recommendation 8: Investigate ways to enhance transparency around insurance company decision-making in flood and storm events.

Recommendation 9: Consider a wider investigation into the contribution of insurance to small business preparedness and recovery, considering whether the availability of products is sufficient, is insurance providing the commercially available product that the Productivity Commission identify as adequate for withdrawing government financial assistance.

7. The role of innovation and interaction with regional economic vitality

Innovation is a critical activity in transformational change; the change that means improvement above and beyond, back to normal or business as usual. Innovative activity is evident in the way social networks emerge and/ or strengthen to support recovery, in actions and changes that individual businesses and business communities make to build back better.

In each of the case studies there were examples of innovation, at the individual firm level, at the business community network level, in the formation and operation of institutions, as well as the creation and management of governance arrangements.

In each of these examples, the innovative activity has drawn upon an existing capacity and resource within the community, whether specific knowledge, skills, and/ or networks that have allowed the business or business community to respond in a specific way to the opportunity (need for recovery). This is adaptive capacity – the capacity within the business or business community for collective learning, using knowledge and marshalling resources to innovate. Understanding how adaptive capacity develops, is retained and can be enhanced will be essential in understanding resilience in small businesses, business communities and communities.

Innovation provides a lens through which to analyse and draw in the existing regional economic characteristic and vitality. In each of the cases investigated for this report, the extreme weather event is treated in isolation from other events that have happened previously and since. Understanding the cumulative effect of these events, with other events of both climatic, but also socio-economic and demographic nature, is what will really get to the heart of determining community resilience and the adaptive capacity of small businesses.

In each of the cases the pre-existing strengths and weaknesses in the underlying socio-economic fabric of the community, reflected in the performance, vitality and investment activity of the business community underpinned the ability of the business community to recover and even thrive. In thinking about adaptive capacity in SMEs and more broadly of community resilience we need to understand the impacts of cumulative events, and how and how much underlying economic and innovation systems determine adaptive capacity. The strength of economy is a key determinant in recovery, and also the ability to withstand subsequent and compounding impacts.

Recommendation 10: Consider how to develop an evidence base on the contribution of economic strength and vitality to regional resilience to provide a rationale for further efforts to build adaptive capacity through enhancement of financial capital. A lot of local business level data is collected in the aftermath of a disaster event, we should consider how can we better collect and use this data to contribute to this evidence base.

References

- ABC News, (2014). "Blue Mountains Bushfires - One year on." Retrieved 1st May 2017, 2017, from <http://www.abc.net.au/news/2014-10-17/remembering-the-blue-mountains-bushfires-one-year-on/5819100>.
- ABS (2016), Population Census
- ABS (2011), Population Census
- ABS (2015), Estimated Resident Population, Australian Demographic Statistics, Catalogue number. 2069.0.30.007
- ABS, (2015), Gross Regional Production, NSW State and Regional Indicators, Catalogue Number. 1338.1
- Agarwal, R., & Green, R. (2011). The role of education and skills in Australian management practice and productivity. *Fostering Enterprise: The Innovation and Skills Nexus—Research Readings, Adelaide, National Centre for Vocational Education Research (NCVER)*, 79-102.
- Anderies, J., M. Janssen and E. Ostrom (2004). "A framework to analyze the robustness of social-ecological systems from an institutional perspective." *Ecology and society* **9**(1).
- Anderies, J., B. Walker and A. Kinzig (2006). "Fifteen weddings and a funeral: case studies and resilience-based management." *Ecology and Society* **11**(1).
- Béné, C., R. G. Wood, A. Newsham and M. Davies (2012). "Resilience: new utopia or new tyranny? Reflection about the potentials and limits of the concept of resilience in relation to vulnerability reduction programmes." *IDS Working Papers* **405**: 1-61.
- Bier, V. M., Y. Y. Haimes, J. H. Lambert, N. C. Matalas and R. Zimmerman (1999). "A survey of approaches for assessing and managing the risk of extremes." *Risk analysis* **19**(1): 83-94.
- Blaikie, P., T. Cannon, I. Davis and B. Wisner (1994). *At Risk: Natural Hazards, People's Vulnerability and Disasters*. London, Routledge.
- Blue Mountains Council, (2009). "Population profile and forecast." Retrieved 1st May 2017, 2017, from <http://www.bmcc.nsw.gov.au/yourcommunity/populationprofileandforecast>.
- BMEE. (2017). "Economic Profile." Retrieved 1st May 2017, 2017, from <https://bmee.org.au/>.
- Bosomworth, K., J. Handmer and 175-183. (2008). Climate change and community bushfire resilience. *Community Bushfire Safety*. K. Handmer and K. Haynes. Collingwood, CSIRO: 175-183.
- Bristow, G. (2010). "Resilient regions: re-'place'ing regional competitiveness." *Cambridge Journal of Regions, Economy and Society* **3**(1): 153-167.
- Brown, P.R., Nelson, R., Jacobs, B., Kokic, P., Tracey, J., Ahmed, M., and DeVoil, P. (2010). Enabling natural resource managers to self-assess their adaptive capacity. *Agric. Systems* **103**(8): 562–568 .

- COAG (2011). National Strategy for Disaster Resilience: Building the resilience of our nation to natural disasters Canberra ACT, Council of Australian Governments.
- Citizens Review (2017) Lismore Citizen's review of the March 2017 Lismore Flood, available <https://www.ses.nsw.gov.au/media/2406/citizens-review-public.pdf>, accessed 1st November 2018.
- Government of Australia, (2009). Powering Ideas: An Innovation Agenda for the 21st Century. *White Paper* <http://www.innovation.gov.au/innovationreview/Pages/home.asp>.
- Hammil, K. and Tasker, L. (2010). "Vegetation, fire and climate change in the greater Blue Mountains World Heritage area." Department of Environment, Climate Change and Water, Sydney.
- Holling, C. S. (1973). "Resilience and stability of ecological systems." Annual review of ecology and systematics **4**(1): 1-23.
- Holling, C. S. (1986). "The resilience of terrestrial ecosystems: local surprise and global change." Sustainable development of the biosphere **14**(292-317).
- Hudson, R. (2009). "Resilient regions in an uncertain world: wishful thinking or a practical reality?" Cambridge Journal of Regions, Economy and Society **3**(1): 11-25.
- Jacobs, B., L. Boronyak-Vasco, K. Moyle and L. P. (2016). "Ensuring resilience of natural resources under exposure to extreme climate events." Resources **5**(2): pg.20.
- Justice (NSW Department of) (2016). Regional Recovery Co-ordination Report September 2016 NSW Inland Flooding. Sydney: NSW Government.
- Justice (NSW Department of) (2016a) State Recovery Co-ordinator Report, June 2016 East Coast Low, Sydney: NSW Government.
- Leach, M., J. Rockström, P. Raskin, I. Scoones, A. Stirling, A. Smith, J. Thompson, E. Millstone, A. Ely, E. Arond and C. Folke (2012). "Transforming innovation for sustainability." Ecology and Society **17**(2).
- Leal Filho, W., Ed. (2016). Innovation in Climate Change Adaptation. Climate Change Management. Switzerland, Springer.
- Linnenluecke, M. K., A. Griffiths and M. Winn (2012). "Extreme weather events and the critical importance of anticipatory adaptation and organizational resilience in responding to impacts." Business Strategy and the Environment **21**(1): 17-32.
- LLS (Local Land services NSW) (2016) "Central West Farmers urged not to wait to report flood damage" LLS Media Statement, 5th October 2016, available here <https://centralwest.lls.nsw.gov.au/resource-hub/media-releases/2016/central-west-farmers-urged-not-to-wait-to-report-flood-damage>, accessed 1st November 2018.
- Lundvall, B.-A. (1992). National innovation system: towards a theory of innovation and interactive learning. London, Pinter.
- Markard, J. and B. Truffer (2008). "Technological innovation systems and the multi-level perspective: Towards an integrated framework." Research Policy **37**(4): 596-615.
- Moser, S. C. (2009). "Governance and the art of overcoming barriers to adaptation." Magazine of the International Human Dimensions Programme on Global Environmental Change **3**: 31-36.

- Moser, S. C. (2010). "Now more than ever: the need for more societally relevant research on vulnerability and adaptation to climate change." Applied Geography **30**(4): 464-474.
- Nelson, D. R., W. N. Adger and K. Brown (2007). "Adaptation to environmental change: contributions of a resilience framework." Annu. Rev. Environ. Resource **32**: 395-419.
- Nelson, S. (2017) Counting the cost, Report on the 31 March 2017 natural disaster for the Lismore Business Flood Recovery Taskforce, Lismore.
- NIEIR (2017). The NEwewll Highway closure in 2016 from flooding: The direct and indirect effects. Bland Shire Council, The Newell Highway Task force, Government, Primary Producers, and Transport organisations.
- NSW Rural Fire Service, (2014). Blue Mountains Bush Fire Management Committee Bush Fire Risk Management Plan. NSW, NSW Rural Fire Service.
- OECD (2006). Frascati Manual 2002: Proposed Standard Practice for Surveys on Research and Experimental Development, OECD.
- Oliver-Smith, A. (1996). "Anthropological research on hazards and disasters." Annual review of anthropology **25**(1): 303-328.
- Productivity Commission, (2014). Natural Disaster Funding Arrangements. Canberra, Productivity Commission. **Report no. 74**.
- RDA (Regional Development Australia) Central West, (2015). Regional Economic Profile, Central West , www.rdacentralwest.org.au, Regional Development Australia Central West: 70
- RDA (Regional Development Australia) Central West, (2016). Central West 2016 Flood Recovery report
- Rodima-Taylor, D., M. F. Olwig and N. Chhetri (2012). "Adaptation as innovation, innovation as adaptation: An institutional approach to climate change." Applied Geography **33**: 107-111.
- Røpke, I. (2012). "The unsustainable directionality of innovation—The example of the broadband transition." Research Policy **41**(9): 1631-1642.
- Ruttan, V. W. (1996). "What Happened to Technology Adoption-Diffusion Research?" Sociologia Ruralis **36**(1): 51-73.
- SES (NSW State Emergency Service) (2017) Independent review of the NSW SES Operatinal Response to the Northern Rivers Flood March 2017, E-Risk Consultants: Sydney, available <https://www.ses.nsw.gov.au/media/2344/nsw-ses-operational-response-to-northern-floods-march-2017-final-180717-002.pdf>, accessed 1st November 2018.
- Sharpe, S.A., Jacobs, B. and Boronyak-Vasco, L (2017) *Forced adaptation: Innovation and business recovery after natural disasters*, presented at 6th Disaster and Emergency Management Conference, Gold Coast 22nd-23rd May 2017.
- Smit, B. and O. Pilifosova (2003). "Adaptation to climate change in the context of sustainable development and equity." Sustainable Development **8**(9).
- Smith, A. and A. Stirling (2010). "The politics of social-ecological resilience and sustainable socio-technical transitions." Ecology and Society **15**(1).

- Smithers, J. and A. Blay-Palmer (2001). "Technology innovation as a strategy for climate adaptation in agriculture." Applied Geography **21**(2): 175-197.
- Su, H. N. and I. M. Moaniba (2017). "Does innovation respond to climate change? Empirical evidence from patents and greenhouse gas emissions." Technological Forecasting and Social Change.
- Tasker, E., and K. Hammill (2010). "Vegetation, fire and climate change in the greater Blue Mountains World Heritage area." Department of Environment, Climate Change and Water, Sydney.
- Walker, B., C. S. Holling, S. Carpenter and A. Kinzig (2004). "Resilience, adaptability and transformability in social–ecological systems." Ecology and Society **9**(2).
- Watts, M. (1983). "Hazards and crises: A political economy of drought and famine in Northern Nigeria." Antipode, **15**(1): 24-34.
- Weber, K. M. and H. Rohracher (2012). "Legitimizing research, technology and innovation policies for transformative change." Research Policy **41**(6): 1037-1047.
- Wollondilly Shire Council (2016) Picton Post Event Analysis: Report on June 2016 Weather and Flood event, published 26 November 2016, Picton: Wollondilly Shire Council.