

Recovery from disaster: A case study of individual and community resilience in the face of cyclones

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Abstract

This paper reports one of four case studies that are part of a larger study aimed at identifying indicators of individual and community resilience to a disaster event. The case studies were conducted in eastern Australia communities which have experienced different kinds of natural disasters or extreme weather events, namely: cyclone, flood, fire and drought. This research was intended to identify the characteristics and indicators of resilience in and across different communities experiencing different natural disasters. The case study reported here draws on data collected from individual and focus group interviews to examine factors perceived to be critical to individual and community recovery from a major cyclone.

Two different groups of participants were interviewed: (1) a cross-section of community residents or stakeholders (e.g. small business owners, farmers, construction workers, women's groups); and (2) disaster emergency (e.g., state emergency management services, emergency medical services, fire and rescue, ambulance) and recovery respondents (e.g., community welfare agencies, mental health professionals) who were involved in assisting the community during and after the event. A semi-structured interview posed questions to both groups on what helped during and after the event, how different groups coped and which ones were most affected, with particular attention paid to beliefs, behaviours and policies cited as promoting post-disaster resilience.

Key findings that emerged include the critical role in individual and household resilience of strong social networks or experience in being self-sufficient, and the importance of coordinated material and psychological assistance through the recovery phase, particularly to people whose housing or businesses suffered severe damage. The implications of the study raise a challenge for disaster respondents and policymakers of finding an appropriate balance in the extent of support provided and enabling individuals and communities to develop adaptive capacity without becoming dependent on external assistance.

Keywords: disaster, community, cyclone, adaptation, climate change

Introduction

The world's climate is experiencing marked changes. With predictions of heightened climatic uncertainty brought about by global climate change, there is an urgent need to examine disaster impacted communities to find out what has supported their sustainability and adaptation to living in natural hazard prone areas.

When a natural hazard overwhelms a community, the consequent disaster shuts down many services and impacts upon the capacity of local institutions to function. An unprepared community might be pushed into crisis. It is during the immediate period before a natural hazard impact, during the passage of the hazard, and in the days immediately following, that communities must rely on their own knowledge and adaptive capacity to prepare, survive, cope and recover. Community surveys in Australia underscore a lack of preparation for a range of gradual onset hazards such

as floods (ABS 2008; GNS 2007), bushfire (Bushnell, Balcombe and Cottrell 2007), and cyclones (Anderson-Berry and King 2005).

Emergency management responses and strategies within this context face many challenges. Data on disasters and disaster risk reduction are often lacking at the local Australian level, which can constrain improvements in local vulnerability reduction (IPCC 2012). In an effort to design effective adaptation and risk management strategies it is critical that government, especially local government and emergency management examine best practice: what strategies increase effective responses to natural hazards, reduce vulnerability to hazard impact and enhance community recovery in specific contexts? Post-disaster recovery and reconstruction processes do not only provide an opportunity for reducing weather- and climate-related disaster risk and for improving adaptive capacity locally, they also provide valuable knowledge and lessons for application more broadly, increasing the capacity for longer-term planning and policy changes for sustainable development nationally and internationally.

Post-disaster case studies can illuminate the diverse factors that influence individual and community resilience. This understanding can be used to design interventions to improve community resilience for responding to and recovering from emergency climate change contingencies.

This paper reports one of four case studies that are part of a larger project aimed at identifying private and public sector groups' beliefs, behaviours and policies that support community resilience to a disaster event. The case studies were conducted of communities in eastern Australia which have experienced different kinds of natural disasters or extreme weather events, namely: cyclone, flood, fire and drought. This research was intended to identify the characteristics and indicators of resilience to climate change in and across different communities and different natural disasters. The case study reported here examined how people responded to and recovered from a major cyclone. A range of perceptions of individual and community resilience were documented through individual and focus group interviews. Particular attention was paid to beliefs, behaviours and policies cited by particular community sectors as assisting recovery and promoting post-disaster resilience.

A Framework for Studying Recovery from Disaster

Bronfenbrenner's bioecological model or systems theory (1979; 1989) "is often used to help understand the dynamic relationship between risk and protection. The model is helpful because it supports exploration of relationships and processes, rather than being limited to a simplistic list of risk factors" (Sutherland, 2005, p. 600). This model therefore lends itself well to the examination of risk or vulnerability and protection or resilience in the face of extreme climate events in that it views the individual's adaptive capacity within a system of multilevel environmental relationships.

This suggested its usefulness as a conceptual framework to examine the influences that shape individuals' resilience in a disaster impacted community given that resilience can be viewed as the ability to positively adjust or adapt to adversity. We used this model (Figure 1) to organise factors that individuals cite as helpful according to the placement of the factor in relation to the individual's ecosystem

(Boon et al 2012). Using this framework we can examine individual characteristics, such as adaptive coping and optimism, as well as factors that are external to the person, such as family support, neighbourhood networks, health provision, and state and federal government financial support. This type of factor categorization facilitates the evaluation of existing policies and provides a rationale for formulating future interventions to support individuals and communities (Boon et al 2012).

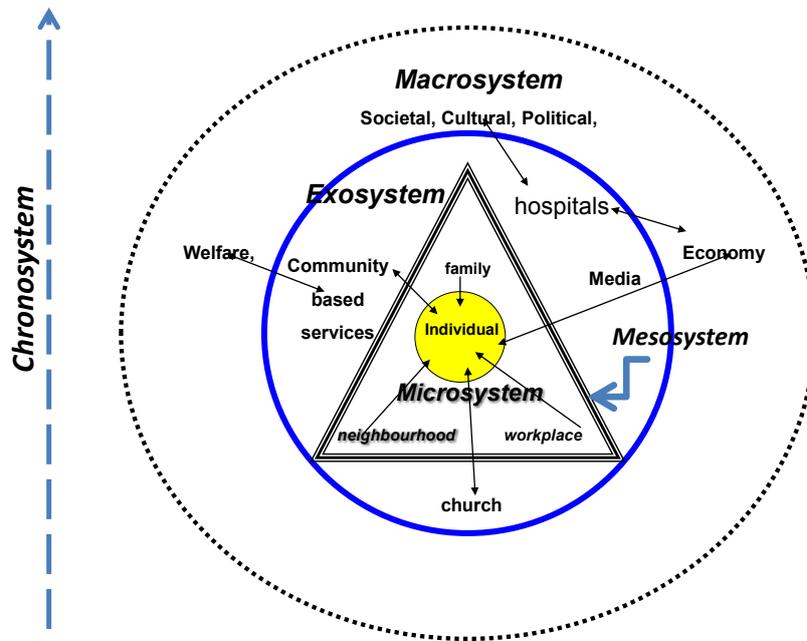


Figure 1 Conceptual scheme of Bronfenbrenner's systems and their interactions (Diagram constructed by authors to illustrate Bronfenbrenner's theories) (Boon et al 2012)

Bronfenbrenner structures an individual's social context into five areas (Bronfenbrenner, 1989):

- a. **Microsystem** – the environments and spaces where the individual interacts directly every day.
- b. **Mesosystem** – the everyday environments in which microsystem members interact independent of the central individual's interactions
- c. **Exosystem** – larger and more loosely defined entities and organisations (e.g. social welfare services, neighbours) that might be accessed by the individual or their family less frequently.
- d. **Macrosystem** – the customs, cultural beliefs/attitudes/values, and political ideologies that represent the cultural fabric of the individual's society.
- e. **Chronosystem** – the elements of time and socio-historical conditions as they relate to events in the individual's environment over the lifespan.

The processes and experiences that the individual is exposed to either directly or through proximal interactions with the various systems above are thought to interact with their predispositions to structure their perceptions and responses, their

behaviours, their adaptation and their acquisition of knowledge and skills (Bronfenbrenner and Ceci 1994).

The Context

Innisfail is located 88km south of Cairns and 260km north of Townsville at the confluence of the North and South Johnstone rivers. It is a major centre within the Cassowary Coast Regional Shire that also includes the towns of Babinda, Tully, Mission Beach and Cardwell. Innisfail and the surrounding region's main industries include tourism, aquaculture, agriculture and tropical fruit horticulture, with a prominent reliance on the sugar cane and banana industries (innisfail.oz-e.com.au, 2010).

The town and the surrounding region is widely known for its multicultural and ethnic diversity with many people within the community originating from overseas or descendants of migrants from countries such as Italy, Greece, the former Yugoslavia, India and northern Laos (innisfail.oz-e.com.au, 2010). According to the Australian Bureau of Statistics' (ABS) 2006 census data, the former Johnstone Statistical Local Area (SLA) consisted of 12.6% of the population born outside of Australia and 9.2% identifying as Indigenous Australians (ABS 2010). Innisfail's notable ethnic and cultural diversity is also coupled with a large proportion of families (73%) and a corresponding youthful population. Almost 20% of the former Johnstone SLA's population were aged between 0 and 14 years of age (ABS 2010).

The former Johnstone SLA represents a broad spectrum of vocations with a predominance of managers, technicians, trade workers and labourers with 10.7% of workers involved in the construction industry and 12.3% in property and business services (ABS 2010). Primary industries, however, were the largest contributor to the region comprising 39.7% of the businesses categorised by industry according to the 2006 census data (ABS 2010a).

Immediately following Cyclone Larry there was a decrease in population within the now defunct Johnstone Shire area (ABS 2010). By 2007 the population of the former Johnstone SLA began to gradually recover with the population surpassing pre-cyclone levels by 2008 (ABS 2010). According to Queensland Government statistics, the projected population for the Cassowary Coast Local Government Area (LGA) will reach 29,623 by 2011 (Office of Economic and Statistical Research (OESR), 2010).

The Cyclone Event

During the early hours of the 18th March 2006 Cyclone Larry formed from a low-pressure system over the Coral Sea and was classified by the Bureau of Meteorology (BOM) as a severe Category 3 cyclone and continued to intensify into a Category 5 as it tracked towards the northern Queensland coast (BOM 2007). The eye of the cyclone crossed the coast near Innisfail around daybreak on the 20th March 2006. Upon landfall wind gusts were estimated to have reached up to 240km/h, which led to Larry being categorised as a Category 4 cyclone.

Cyclone Larry's winds had a devastating impact, destroying thousands of buildings throughout the cyclone affected area. Fortunately no lives were lost with only 30 recorded injuries. The large-scale devastation created by Cyclone Larry led to over 300 people being evacuated from their homes throughout the cyclone affected area (Australian Red Cross 2006; BOM 2007).

Electricity transmission lines were cut both to the north and southwest of Innisfail, with extensive damage to the electrical distribution network. This led to the disruption of power to vital utilities such as the local hospital, and water supply and treatment facilities (Adrian Hitchman et al 2006). Other vital infrastructure was either badly damaged or disrupted with all road and rail access to the region being cut for several days following Cyclone Larry due to heavy flooding (Hitchman et al 2006). Many houses lost their roofs during the event and the Insurance Council of Australia recorded a total of \$540 million in insurance claims resulting from Cyclone Larry (The Honourable Peter Beattie, 2006; BOM 2007).

Aims of the Study

The aim of this research was to understand community perceptions about what assisted in the response to and recovery from the 2006 Cyclone Larry in the Innisfail region. This understanding was intended to help identify indicators of resilience to climate contingencies in a diverse community experiencing cyclones and to link community level factors with individual level factors of resilience. We were also interested in identifying private and public sector groups' beliefs, behaviours and policies that have supported community resilience to a cyclone.

Methods

Interviews were conducted with two different groups:

- (1) key informants (KI) comprising various categories of disaster emergency (e.g., state emergency management services, emergency medical services, fire and rescue, ambulance) and recovery respondents (e.g., community welfare agencies, mental health professionals) who were involved in assisting the community during and after the event.
- (2) a cross-section of community residents (R) (e.g. small business owners, farmers, construction workers, women's groups) determined from a demographic profile of each community and conversations with key informants and community representatives of various organisations.

Members of these two groups were not mutually exclusive as many engaged in disaster response were also members of the affected community. Particular attention was paid to including (although not always successfully) participants for the community focus groups and key informants, those most affected by the event and to members of vulnerable groups, even if they were not widely represented in the community.

A semi-structured interview of open questions was developed for use with each group. Questions to informants and the community addressed the kinds of assistance that helped (and/or were provided) both during the event and after the event, how different groups coped and which ones were most affected, and the impact on the community. The difficulty of scheduling people at the same time led to only two focus groups being conducted and many individual or paired interviews.

The length of interviews varied from around 30 minutes to two hours. Interviews were conducted between August, 2010 and January, 2011 with a series of final interviews scheduled in early February on responses to Cyclone Larry unable to be completed because of Cyclone Yasi. A total of eighteen key informants and twenty community residents were interviewed at this site. All the community residents who were interviewed lived in the Innisfail region at the time of Cyclone Larry.

Interviews were taped in most cases and transcribed (except in a few cases where recordings were inaudible) and notes were taken and later expanded. Transcribed tapes (or notes when transcriptions not available) from interviews were analysed separately using the qualitative data technique of open coding in which the main issues that emerged are first identified and coded. These codes were then categorised into themes or recurrent patterns. Common themes were identified within and across the Bronfenbrenner categories of scale: the microsystem, mesosystem, exosystem, macrosystem and chronosystem.

Findings

A number of major themes emerged from the interview participants' responses to five major interview questions:

- (1) What or who helped during and after the cyclone?
- (2) Who were most affected?
- (3) How did different groups cope during and after the cyclone? Who didn't cope well?
- (4) What was the perceived (short and long term) impact on the community?
- (5) How prepared is the community to face future cyclones?

Key influences or factors were first identified among the responses to each of these questions. For example, three factors emerged from the responses to the first question (what and who helped?) as important to helping individuals and the community during and immediately after the cyclone. These were: readiness or preparedness for the event; immediate responses from government and other agency services to meet basic needs (e.g., food, water, energy supplies, medical); and community spirit. Three broad groups were identified as providing assistance – various government agencies at all levels (including the Army); non-profit national and local community organisations; and members of the community itself.

The factors identified within responses to each question were then constructed into major themes across the question responses in relation to both the immediate response to and recovery from the cyclone. Findings are presented in categories of system level themes. The major themes at the micro-system level were: contributing factors to readiness or preparedness; and the impact (i.e., the most affected) on individuals and families whose homes or crops were severely damaged. The mesosystem themes were social networks; and the impact (i.e., the least resilient groups) on the poor, young and new or transient residents. Four themes emerged at the exosystem or local community, regional, state and federal levels: community spirit; kinds of assistance provided by local business, non-government and community organisations; response by private regional infrastructure providers; and kinds of assistance provided by state and federal government. A number of claims are made within and across these themes.

The Microsystem of Individuals and Families

Readiness/Preparedness

Stakeholders reported being placed on a high state of readiness before the cyclone occurred, which assisted in their preparation for and response to the event. An awareness that the cyclone had a high possibility of impacting the Innisfail area - the cyclone “was in the news, it was everywhere” (R) leading up to its landfall - alerted most stakeholders. Prior experiences and learning gleaned from fellow members within the community reportedly contributed to creating this state of readiness by helping jolt a number of stakeholders into action. As one local stakeholder commented, seeing her elderly father who had been through numerous cyclones feverishly prepare his property made her think “ok this is serious...I was thinking hell if he is cleaning up we better start doing something.” Being ready and prepared for the impact of the cyclone and feeling “self-sufficient” also included having canned food, water, gas bottles and other supplies on hand (KI,R). One respondent argued that residents of Far North Queensland are also better mentally prepared because of experiences of living with extreme weather events.

Emergency respondents, however, had a somewhat different view of the community’s awareness of and preparation for the impending cyclone. While respondents reported that information technologies, particularly the internet, allowed them to accurately track the cyclone’s path (KI), they believed this warning was not widely disseminated or known until at least two days prior to the event, when the local Mayor informed the community at a local festival to go home and get their families and properties prepared. This perceived late notice was viewed as contributing to ill-preparedness and a lack of readiness. A number of respondents noted that many people did not seem to “know what was going on”, or acted complacently (KI,R).

Some stakeholders agreed that there was at least a disbelief, which could be seen as bordering on complacency, among some people in the community that resulted in a lack of preparation. This applied not only to some “newcomers” to Innisfail who had never experienced a cyclone before and were unaware of its potentially serious impact, but also to those who had experienced previous cyclone warnings but were in a state of disbelief that the cyclone would actually hit Innisfail (but swing away and miss the town) – a feeling reinforced by the weather the day before the cyclone struck being calm and sunny with many folk participating in a local festival.

“I had a conversation with one of our carers and I rang them because once I had been called into work... and then went and rang family day care providers who come in and they service... and said to this particular carer, 'have you notified your parents what are you going to do tomorrow have you cancelled care?' and they said 'what for?' I said 'the cyclone is coming', and he said do you really think it is going to hit?' 'Well everybody else thinks it is'...” (KI)

The increased accuracy that has been developed in predicting the path of cyclones was viewed as not consistently reflected in the media. Internet websites such as the Bureau of Meteorology were seen as reliable, however traditional media resources such as Television and Radio news media were seen as ‘not clear about anything’

and contributing to confusion (KI). Yet one service provider believed that prior warnings were taken seriously: "I think everyone here, listened to the warnings, and that is one good thing about our community is that they do heed to the warnings that were sent." (R). The data just presented suggested the first claim that can be made about people's preparation in Innisfail for a cyclone:

Claim 1: Past experiences with and current knowledge of cyclones can assist preparedness, but past experiences with inaccurate predictions of landfall of cyclones can hinder preparation.

Both residents and service providers acknowledged that some people were not prepared with extra fuel, food and other daily living necessities (KI,R): "I guess I was surprised at .. what seemed to be a relatively large number of people ...that were unprepared in terms of... they needed things like .. baby nappies and they needed things like food." (KI)

However, it was pointed out:

[Lack of preparedness] broadly speaking, I think it's a function of income. I think probably your best measure is low income individual families and individuals. Because of the income, obviously you need money to stock up. If you're living cheque to cheque - payday to payday, low income families - predominantly low income families rely on welfare." (KI)

In addition to a lack of financial resources, some respondents argued that many people don't take responsibility for their own preparations and have become dependent on others for support (KI,R)

"...some of those issues around long term welfare dependency about you know, whether that starts to [limit] people's capacity to look after them[selves], you know, to make decisions and to take responsibility... goes in some of the stuff Noel Pearson talks about, you know. Things like people's rights - their right to take responsibility. You see I'm struggling to sort of say that sort of thing in the confines of a social welfare department, but yeah, it's a real factor. So welfare dependency I think was two things going on there - the low income plus the expectation that comes up over time that somebody will look after you. (KI)

Another dimension of vulnerability occurs across a broader socio-economic spectrum and involves people who struggle with the realisation that they would not get help straight away after the cyclone struck their community:

"[It is hard to get people to realise] community members as well as agencies to come to terms with that stuff can't be...yeah, you can't snap your fingers and have it appear, particularly your transport connections are strained. It took 48hrs or whatever to get the road open. There's a tiny little runway there that came down - has limited capacity in terms of the planes and set-down there... I guess there was a large number of people who were very dependent on relief very early in the piece." (KI)

In contrast, families in outlying areas were singled out for being well prepared and having coped well because they are used to stocking up on supplies and being self-sufficient:

I found that people who lived out, like Mena Creek... the ones that don't regularly come into town coped a lot better and I think that comes back to...people had food out there and I'm not saying that everyone did but the families that I ended up seeing they seemed to have coped a bit better because they were prepared and they are not used to coming into town every day...and some people don't have power so they have their own generators and there might have been some issues with getting diesel and petrol and that but they coped ..." (KI)

These findings suggest that people's readiness or preparation for a cyclone is limited by an individual's or household's: (i) economic resources given that they can't afford to stock up on food and other daily necessities, gas bottles or buy generators; and (ii) beliefs or dispositions about self-responsibility for their own preparations or self-sufficiency regarding support. Our analysis of the data on preparedness in response to interview questions about what and who helped during and after the cyclone, who were most affected and how different groups coped during and after the cyclone leads to our second thematic claim:

Claim 2: Individual and household preparedness for a cyclone is affected by resource capacity (e.g., financial resources, equipment) and beliefs (e.g., acceptance of self-responsibility, self-efficacy).

Individuals and Families Most Affected: Homes or crops severely damaged

Irrespective of the extent of their preparation there were individuals and groups who were adversely affected by cyclone Larry and therefore whose resilience was particularly tested. In response to our questions about who was most affected, two groups were identified: people whose housing and material possessions or businesses were lost or severely damaged; and people in the agricultural sector, particularly banana, sugar cane and exotic fruit farmers who lost their crops.

Many of the interview participants felt that those who had damaged or destroyed homes and properties were the most affected by Cyclone Larry. This was due to a number of factors including the stress of losing valuables, the uncertainty over insurance claims, and the inability to find interim accommodation whilst their houses were in such a damaged state. Many people who lost their housing or had extensive damage to their properties had to leave Innisfail and move to Cairns for accommodation, either voluntarily or under pressure of having their houses condemned, owing to a severe housing shortage or unaffordable rents resulting from sudden large rent increases (KI, R)

Of the people who had significant damage to their properties some were uninsured, some of those who were insured had the added stress of fighting their claims with insurance companies, and then others (reported to be at least 10%) whose renovations and repairs were shoddy or not done correctly (R) had to battle with, contractors, usually from out of town, and often their insurance company as well (R).

“People are still going through the nightmare again... The nightmare continues... They had a leaking house and got the insurance to pay the people who did the job and they had to refund the money and [move] out their house [again] and the nightmare still continues. The job wasn't done properly...Some people got a palace built, where they just had a dump [before the cyclone]. It's like Ying and Yang. Some people did good and some people are still suffering. (R)

Many of the people who lost their houses and material possessions or could not leave their properties owing to debris were reported to be unhappy and still trying to cope. Some had their houses condemned and “a year later, people were still living in temporary accommodation and there were still a thousand houses with tarps on their roofs” (R). Four years later many still had tarps on their roofs.

Elderly, whose own house or whose children's house in which they were living was affected, had to move into aged care facilities and many were not able to move back into their own or children's homes. They were reported to be disrupted by the breakup of the family structure and forced into aged care before they were ready (KI).

Banana, cane and exotic fruit farmers in the region suffered a massive loss of profits (KI,R) as their crops were destroyed with no banana crop production or income for at least 9 months. Sugar was reduced to only a half crop with low sugar content owing to excessive rains following the cyclone resulted in cane being rejected from processing. Exotic fruit growers were faced with an even longer time before their trees would produce again. Their problems were compounded by a lack of workers to help pick up fallen fruit and clean up their farms as well as the dilemmas many faced of helping their farm business by focusing on picking the banana crop immediately or helping their family by attending to fixing their own house or, more simply, using the generator for business or home (R).

...There were growers that couldn't go in and clean up their farms [pick up fallen bananas and other fruit] because they had no workers, all the workers had their thousand dollars [government assistance] tucked under their arm and had gone to the Brothers Club...that was the last opportunity you had to make any money for nine months...I had to go fix my house and look after my family and the only money I am going to get for nine months will be lost in the next week...it was very hard. (R)

Some farmers lost everything – their farm destroyed, crops flattened, and house and shed damaged. Not surprisingly, depression among these farmers was not uncommon:

Farmers are generally resilient, they are just renowned for it, some took hits, I had farmers crying in front of me you know? They virtually couldn't see any future, their farm had been destroyed, flattened, and the shed is bugged, the house is bugged, they couldn't see the future..... It was too hard, there was a quite a bit of depression within the growing sector, like I said they have got a house that has fallen down, at home they have got a tractor shed that

isn't working for them, some just decided they didn't want to do anything, it was like they were stunned. I had one bloke come here, he couldn't get me on my phone, my phone would go off the hook every day, he came around to the shed and he just sat there and started crying I said 'mate go and see a doctor' ... I said 'you gotta go and see a doctor'... (R)

As indicated, farmers are generally resilient "once they got over the initial shock .. they just got stuck into and did what they needed to do." However, for some farmers who were at their financial limit or close to retirement, the financial or psychological impact of the cyclone pushed them beyond the boundaries of their resilience and they left the industry.

Claim 3: As well as capacity and beliefs, the severity and nature of the impact of a cyclone on households have a large influence on individual and family resilience (and therefore on their need for external assistance or support from government and other agencies).

The Least Resilient: Economically strained and new or transient residents

As already discussed low socio-economic groups were unable to afford to prepare adequately for the cyclone, but views differed on how well they coped with recovery from the cyclone. One respondent argued that people from low socio-economic groups were:

well looked after provided financial assistance ...lot of them [people from low socio-economic groups] relied on a lot of the funding that came through so they were getting money in one hand and they were also getting handouts for food and fuel in town were given out and things like that were given to them. Life was good for those probably at the bottom of the scale who normally don't have those things ... (KI)

On the other hand, those from limited economic resource groups whose rental housing or own, especially uninsured, home was damaged to the extent of being uninhabitable had to leave town because of unaffordable rents and, in the latter case, hope and wait for government assistance to carry out repairs. Similarly, people whose business was already somewhat precarious and who received insufficient government assistance to overcome their recovery costs had to close their businesses.

Claim 4: Those who lack economic resources and receive insufficient government or insurance assistance to overcome major housing or business damage sustained in the event, and new or transient and other community residents who lack community connections are likely to be the most vulnerable in their resilience to a cyclone.

The Mesosystem and Social Networks

As Bronfenbrenner's model identifies, individuals interact directly with people in their microsystem which includes family, friends, neighbours and workplace colleagues. These relationships constitute one level of a social network. As one respondent

stated, if people “didn’t have any relations in the area, they didn’t know where to go, they didn’t know how to go there and a lot of places” (KI).

According to Bronfenbrenner’s framework, an individual can also access the connections of family members, neighbours and work colleagues to other systems (e.g., a parent’s workplace, a child’s school, a neighbour’s sporting club), known as exosystems. In other words, people are members of multiple communities (workplace, school, church, sports clubs) in addition to their place of residence. The above comments about transients and newcomers lacking local connections highlight the importance of these social networks or networks of communities which contribute to social capital which is a contributor to resilience (Cottrell et al 2007).

Those individuals, including elderly, who remained connected to the community and knew others around them, were deemed to have coped better:

I think [even if you are from a low income background] but you’re still strongly connected, and feel a part of your community, have good strong community networks or engage with community groups. So hence, you’ll see that - so you can be low income and old...huge generalisations here, but you can be an older person on a low income so the pension only, but if you engage with the CWA and the Senior Citizens Hall and you go and play bridge every Wednesday with neighbours and Doris and all that and you’ve got family and you know the butcher, the baker, the candle-stick maker, you know, you’re well placed, your buffeted, your connected, you’re not going to be left alone if you’re liked... so you reach out to help people [and] people [will] reach out to help you. (KI)

Social networks, especially among ethnic groups such as Italians and indigenous communities, were seen as a strong positive influence and helpful coping mechanism (KI). The indigenous community was fairly resilient (KI,R) because it was suggested they are not as dependent on businesses and farms which were affected (R) and have cohesiveness and sense of their place within the community (KI)

The indigenous community is a perfect example [of resiliency] you can be low income but because you’re part of a community and you have a place in community - as long as it’s a reasonably functioning community which I think it’s fair to say, you know - the communities out the back of Tully.... In the scale of things, uh, you know, are still quite a cohesive community there. You had high needs - you had high needs all over the place but often that sort of setting is an example of resiliency, having resilience through social connectedness, and having a place in the world I guess and a place in your community. (KI)

On the other hand, two groups that were mentioned as not coping well after the event were itinerants or ‘transients’ and ‘newcomers.’ Transients were seen as not as well prepared financially or in terms of awareness of cyclone threat (KI), while newcomers were portrayed as lacking the knowledge and experience to know how to prepare for the event as well as the deep roots in the community that would have enabled them to connect to sources of advice, support and assistance.

Community Spirit

Social networks are facilitated when there is a sense of community or community spirit. Many interview participants commented not only on the help that was provided by family, friends, and neighbours, but also by complete strangers from within and outside the community. They emphasised that the community ‘banded together’ and tried hard to look out for each other’s interests. There was a common feeling amongst stakeholders that “there was a real...quite beautiful community spirit” (KI) with people checking on and helping each other:

“Our street, Bay Road...one of the guys is a builder and he went and hired a massive generator from Townsville...we...hooked up to that...so we all had power and had certain machineries and so [we] could clean the whole street up in about three days to get rid of rubbish. The whole community, the place got actually better (sic). We tidied up all what was ugly and we all had BBQ every night and it was a real good community... bringing together (sic) as well...disaster bringing them together (sic)... it was fantastic. Someone’s got a generator, I’ve got a track and thrasher... we tend[ed] to help everyone, we cleaned up, kids helped clean up, we all tidied up ourselves.” (R)

Individuals reportedly stepped up and took responsibility (R)

“On my days off [I volunteered] and went to the TAFE and we had to take the food out and sheets and everything and were told that we got to set up everything for them [sheltering at the TAFE]. ... I asked my friends that I play football with, and once we started, they started doing it themselves and one of them took charge and it was amazing to watch. I just stood back... They just needed to be directed, people need guidance, they will step up. You [have to] give them a chance, I was amazed, how leaders come out everywhere.” (R)

By checking on neighbours who might need assistance, working together to clean up and make emergency repairs, and sharing experiences and creating a sense of a shared experience by holding barbeques in the street, there was a strong feeling among stakeholders with whom we talked of community support and self-sufficiency that helped people to deal with the situation and fostered their resilience.

Claim 5: The interrelationships between individuals and the communities in which they reside in the form of social networks that are established and fostered by a strong community spirit or sense of cohesion can contribute to both individual and community resilience.

Exosystem

Kinds of Assistance provided by Local Business, Non-Government and Community Organisations

In addition to assistance provided by family and community networks of friends, neighbours and co-workers, local and regional small food businesses and restaurants and non-profit community organisations were all mentioned as contributing food or water to meet immediate basic community needs. Nearly all stakeholders who were interviewed mentioned the distribution of free food that was

cooked by local cafes and sent in by out-of-town restaurants as well as donated food distributed by the Salvation Army and water distributed by a bottling manufacturer and later on, the government (R, KI)

A number of NGOs and local non-profit organisations were also very active in the post-cyclone period (R, KI) and helped the community during recovery with economic and material assistance, as well as counselling services. These included the Red Cross, Seventh Day Adventist Church, St. Vincent de Paul and several small local organisations.

Smaller community-based organizations helped people with their bills, fuel vouchers, and advocacy:

A lot of [the smaller community based organisations] manage what's called an emergency relief scheme so they...not related to disaster, but also for people who struggle to meet their bills or whatever can - they're funded through the State and Commonwealth government to occasionally provide financial assistance to families in need or it can be assistance in terms of food vouchers and things like that, so they have their emergency relief programs...you know, information, referral, counselling, neighbourhood centres, [they] can sometimes do advocacy ...you know, case management... (KI)

There's a whole support system around the Indigenous community as well...so Indigenous health organisations...which is down in Innisfail is the Mamu Health Organisation...so they have a big role. (KI)

In addition to offering material forms of support, some noted that even for those who did not need or want such assistance their presence provided a useful opportunity to just talk:

I do remember people coming around and offering to help, the church and the Red Cross and everything were coming around and offering help but yeah I suppose it was available but like people are they go 'nah we are right' but some people just come and had a chat which was good at times. (R)

Response by Private Regional Infrastructure Providers

Repairing vital infrastructure is a major task following a cyclone that confronts utility providers, such as in the case of Cyclone Larry, Ergon Energy and Telstra. The larger towns in North Queensland, such as Innisfail, do have permanent diesel generators which mean that power was not completely lost and therefore available to the emergency response teams. Restoration of power, however, was a major concern to restaurants, cafes and food stores and many families for preventing food spoilage and contamination. The local power company was praised for its quick response in bringing in large generators to provide power for whole suburbs (R) and to repair damaged infrastructure. (R)

“Ergon sent a whole troupe of people from all around Australia and sent them up here. I didn't have power at my place for two weeks; two and a half

weeks... they did a really good job considering there was a lot of damage to the power [distribution network]. (R)

Others apparently did not find the loss of power a major issue: "I don't know why, I didn't really hear any people whinge about lack of [electricity]" (R). One resident claimed the reason was that people found other things to do (than watching TV and sitting in air conditioning).

Kinds of Assistance provided by State and Federal Government

The immediate response by the local disaster management group, the army, State Emergency Services, and the local council was widely viewed by local Innisfail residents as efficient and well coordinated:

"I think [the response] was really well coordinated between the disaster management response group locally, the SES, and the army I think they worked really well to get everything done... That side of it I think was handled particularly well, even though there was people complaining, but they would complain no matter what." (R)

Cyclone Larry, being considered one of the biggest cyclones since Tracy which hit Darwin in 1974, became a "political hot potato... basically the minute it happened there was (sic) politicians one after the other come into town... every politician comes in with a truckload of whatever you want, whatever you need" (KI). Political concerns to not repeat the poor response to New Orleans after Katrina (KI,R) resulted in the community receiving more government assistance than similar events. As one resident stated, "we were really lucky that Larry came after Katrina."

The role of government at all levels in assisting recovery efforts was also generally viewed positively, including assistance provided to businesses (reportedly \$10,000) and the injection of cash into the community

Collectively it was fantastic. Within two months, everything is down and flat, it was tidy and clean. It was amazing the speed they've got the town back to normal. I think it was because the incentives they gave us were spot-on. ... But they [the incentives] didn't come until a little bit later and at first people would jump in anyway without incentives. That was a week later when the government gave everyone \$1000. There was no cash around. But ATM didn't work so you couldn't get fuel out because there was no electricity and generators ran out. (R)

Besides financial support, psychological services and support were also provided by the state government through the Queensland Health program on mental health, which was described as helping farmers deal with depression:

We had a lot of growers meetings after the cyclone... and we had people from Centrelink from Queensland Health and they did talks on mental health issues and that side of it, (inaudible) there was people everywhere here and in Tully, Babinda, if you needed help you could go and talk to someone privately and it was a very good response just a month after the cyclone, the first couple of weeks there was probably a gap, after that once people got on the ground

here, if you needed somebody they were here.” (R)

The state government’s response phase, which lasted six months, assisted people with accommodation and daily living requirements. Two community recovery mental health teams were then set up providing extra assistance, in conjunction with various agencies, for another 12 months. A large increase in mental health cases was expected but did not occur, just a large call for assistance immediately after the cyclone but then that tapered off (KI).

“...We expected a great deal [of mental health issues within the Innisfail community following Cyclone Larry] but I think one of the good ...one of the things that came out of Larry was we really didn’t attribute any deaths to Larry. And because of that, I think that...my personal opinion was that made it more easy for the people in the affected area to process their emotions about how Larry had affected them a lot more positively and move on... we were looking for say, a 12% increase [in people seeking their services] and we didn’t get it. We didn’t get anywhere near it...didn’t get near it. I think we were lucky to get about half of them, so that was interesting side-effect of Larry.” (KI)

A dilemma of government assistance was raised by a couple of the interview participants who feel a major downside to the assistance that was provided to the Innisfail community by all levels of government and a range of non-government organisations is that the community’s resilience has been eroded. They argued that people now expect financial assistance following a major disaster, and are unwilling to help themselves and following the event many people have displayed a lack of integrity and self-sufficiency.

“I think the concern at the moment is mostly that there was considerable assistance afterwards and there’s a bit of an expectation now that, that assistance will be there for any event and we found that in the floods because we have annual flooding every year and with the following floods that occurred people were starting to take white goods down into the water instead of putting them up because they think they might get a new washing machine or whatever and they were starting to ring up before that was even announced ' what's the number to get the money?' So it’s set a precedent now that we have to reverse.” (KI)

Claim 6: The kinds (e.g., economic, material, medical/health), extent and timing of assistance provided by local and regional non-government and private bodies and state and federal government agencies are critical to both individual and community post-cyclone resilience but can also create a dependency that inhibits the development of resiliency.

Conclusion

As a consequence of socio-historical conditions (the chronosystem) in modern societies (the macrosystem) individuals have become more dependent on services and institutions in both their local community (within their exosystem) and the larger society (macrosystem). This economic or psychological dependency can become a particular problem when interactions with these institutions are ruptured by a major

disaster such as an extreme weather event. People's expectations regarding assistance were described as degrading their preparedness as many do not take responsibility or have the economic resources to become self-sufficient, leave before the event or mitigate the risks.

In contrast, those individuals, households and groups who have strong social networks (in their microsystem) are able to draw on shared material and social resources to sustain them during and through the aftermath of a cyclone. For example, in the indigenous community in Innisfail the strengths of their (microsystem and mesosystem) interactions made them less dependent on organizations in the larger community (exosystem) during the period of chaos following a cyclone than individuals who lack such close social or cultural ties or relationships. They are able to rely on extended family and neighbours for support for managing or maintaining basic functions and structures. Similarly, those who have had to be more self-sufficient owing to their circumstances (e.g., rural fringe dwellers) are likely to cope better because of their capacity to draw on their own resources and knowledge of more traditional methods of survival (by finding substitutes for lack of power for cooking and entertainment).

Individuals with limited or weak family or neighbourhood (microsystem) interactions (e.g., community newcomers, transients) are likely to have a limited mesosystem which reduces their interactions with supportive community groups and organisations (in the exosystem). A lack of these connections can hinder interactions with loosely defined or informal community groups as well as the larger and more impersonal government and non-government services and organizations.

This suggests that our societies have become potentially more vulnerable and less resilient to disasters unless individuals and communities can draw on personal and social resources and capacities. Yet in an urbanized and suburbanized environment the opportunities to make these connections are not always readily present.

Despite living in environments that, by and large, do not provide support for the development of autonomy, competence, and relatedness, some individuals survive and thrive by relying more heavily on their own abilities. In the face of increased extreme climate contingencies others need to be assisted to learn such adaptive strategies and hence become more resilient. At the same time, recovery from such extreme climate events as cyclones is beyond the sole capacity of most individuals and communities. Finding a balance between adequate economic and psychological support and creating a dependence on external assistance is a challenge for policymakers and respondents charged with responsibility for helping individuals and communities bounce back from and adapt to disaster events.

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