

ABSTRACT

Catastrophic natural disasters by definition overwhelm the capability and capacity of emergency management organisations, at which times, the business sector can provide additional resources to assist communities. This study analyses the involvement of businesses in disaster management in Australia and New Zealand in three severe disaster events: the Black Saturday bushfires (2009); the Queensland floods (2010-11); and the Canterbury earthquake sequence (2010-11). It finds that businesses are already assisting communities to respond and recover from disasters, but there exists significant potential for further participation given a large number of businesses did not report involvement. Businesses are motivated by commitments to their staff and customers and corporate social responsibility, reflecting more complex business objectives than solely profit generation.

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Business involvement in natural disasters in Australia and New Zealand

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Introduction

In recognising that truly catastrophic disasters will overwhelm emergency management organisations, the Australian Natural Disaster Resilience Strategy (ANDRS) acknowledges the business sector as an important participant in disaster management. ANDRS states:

... businesses can and do play a fundamental role in supporting a community's resilience to disasters. They provide resources, expertise and many essential services on which the community depends.

Council of Australian Governments (2011, p. 5)

Businesses are defined here as for-profit organisations that do not comprise part of government. We employ the term business rather than private sector to exclude not-for-profit companies, whose contributions lie beyond the scope of this research.

Disaster management has been typically seen as the preserve of emergency management organisations utilising an all-hazards, all agencies approach (Johnson et al. 2011). The activities and resources of Emergency Management (EM) organisations, however, are generally oriented towards the management of small-scale, relatively frequent events. Maintaining resources for truly extreme events would be prohibitive and unrealistic. As a result, larger scale events will overrun the ability of emergency management organisations to respond effectively at local, regional and even national scales. In reality the role of disaster management is never the sole responsibility of governments and the business sector offers additional capabilities to help support the recovery of impacted communities.

This support can either be by way of direct contributions or through third parties such as non-government organisations. In responding to Hurricane Sandy (2012) in the United States, for example, the business sector was able to move eight times the amount of food into affected areas compared with the combined efforts of government and non-government organisations (Kaufman, Bach & Riquelme 2015). Similarly, after Hurricane Katrina (2005), the retail store, Wal-Mart, frequently outpaced FEMA by several days (Chandra et al. 2016). The business sector can also act with more flexibility than government, making fast decisions and acquiring, moving and disposing of resources rapidly. It can quickly scale its operations to match the need (Busch & Givens 2013).

Partnerships between the public and business sectors need to be tailored based upon the needs and capabilities of the organisations involved. Some are formal in nature and involve regulation or contractual relationships whilst others can be less formal. To be successful both parties need to recognise the value that the relationship creates. Key motivators for government and business sector collaboration include creating public value through building resilience; information sharing to support each other's operations; quicker restoration of essential services; avoiding duplication of effort; the provision of assistance in emergency planning and better decision-making (FEMA 2018).

Examples of business sector engagement in disaster management in the United States demonstrate a need for coordination between the public sector and businesses so that accountabilities and expectations are clear on both sides (Busch & Givens 2013). For example, during Hurricane Katrina relief supplies delivered by Wal-Mart were turned away because FEMA said they weren't needed (Richman 2005). Better coordination reduces duplication of effort and delivers more effective outcomes (Busch & Givens 2013).

Johnson et al. (2011) examined disaster-related activities of large companies in the United States and found that corporations engage in activities related to disasters by way of short-term relief and recovery activities. These were reactive and episodic in nature and included both financial and in-kind activities delivered to employee and customer stakeholder groups. To date there has been little comparable academic research undertaken in Australia and New Zealand, something this study aims to change.

Unlike Johnson et al. (2011), however, we focus on the support that businesses have provided in domestic natural disasters. Specifically, we investigate what role large businesses have played in responding to the 2009 Black Saturday bushfires; 2010-11 Queensland floods; and 2010-2011 Canterbury earthquake sequence. Questions posed include how have businesses undertaken their role? What support did they provide and to whom? And what types of businesses were

involved? We conclude with a brief discussion of policy implications.

Background to events

Three severe natural disaster events from Australia and New Zealand were selected, each of which demonstrably tested emergency management organisations and where anecdotal evidence suggests that businesses assisted in response and recovery efforts.

2009 Black Saturday bushfires

The Black Saturday bushfires (7th February 2009) were preceded by a heatwave generating record-breaking temperatures and extreme fire conditions across Victoria and South Australia. Multiple fires ignited across Victoria. Fires spread quickly due to extreme winds, burning in excess of 450,000 hectares of land, killing 173 people, destroying more than 3500 buildings including 2029 homes and resulting in an economic impact of greater than AUD4.4 billion (Teague, McLeod & Pascoe 2010). The insured loss normalised to 2016-17 financial year societal conditions has been estimated at AUD1.8 billion (McAneney et al. 2019).

2010-2011 Queensland floods

Major flooding affected nearly 75 per cent of Queensland and also parts of northern NSW (Chanson 2011). There were 38 fatalities with an additional 6 persons missing presumed dead, widespread damage to housing and infrastructure, and an estimated economic impact in excess of AUD10 billion (Queensland Floods Commission of Inquiry 2012). The normalised insured cost was AUD2.3 billion (McAneney et al. 2019)

2010-2011 Christchurch earthquakes

On September 4, 2010, the first of a swarm of earthquakes impacted Christchurch, the largest city in the South Island of New Zealand; it was a Moment Magnitude 7.1 earthquake with its epicentre at Darfield some 40 km west of the city. The third of five quakes designated as 'insurance' events occurred on 22 February 2011 and was centred 5 km southeast of Christchurch; this Moment Magnitude 6.3 event resulted in seismic motions well in excess of those underpinning the building code. 185 people died and damage to the CBD was such that much of it has now been demolished and some areas of former residential property designated unsuitable for rebuilding due to liquefaction (McAneney et al. 2015). The cost of recovery is estimated at some NZD40 billion or 20 per cent of annual Gross National Product. The total cost of rebuilding has been estimated at more than NZD40 billion (The Treasury 2014).

Methodology

Lists of the top 100 businesses on the Australian Stock Exchange (ASX 100) (as at 1st December, 2016), and the top 100 NZ companies by number of employees from Catalyst Business (as at 12th March 2019) were obtained. Government agencies were removed from the New Zealand list, and merged with the New Zealand Stock Exchange top 50 businesses (NZX 50) (as at 12th March 2019).

Following Johnson et al. (2011), a content analysis was undertaken based on documents found from internet searches for annual reports and press releases of each business. These were examined for any reference to the three events. If any response or recovery related activities were identified, the relevant text was copied to a separate document for subsequent classification.

A classification schema was produced based on descriptions used by Johnson et al. (2011). Information included source of support; beneficiaries; details of cash contributions; subtype of support where the contribution was not in cash; category of business making the contribution based on the Global Industry Classification Standard (GICS) (Australian Securities Exchange 2019) and reasons for making a contribution and any disaster impacts on the business.

Data were then reviewed and classified into a single table for analysis in Excel. The table of records was analysed using a script in R to produce cross tabulation data from which correlations have been drawn.

Limitations

This study has several limitations, the most critical of which are that contributions need to have been reported. 73 per cent of the event-business combinations searched had either an annual report or a relevant press release; however only 25 per cent mentioned support for any of the three events. It is probable that some businesses provided support but did not disclose this in their annual reports or publish press releases and as such our analyses offer a lower bound on the extent of private sector involvement. Some businesses also reported contributions but without enough detail to identify a source or recipient.

Results

From a total of 314 business and event combinations, 233 annual reports and 10 press releases were found and, of those, a total of 75 businesses were found to have made

contributions (32%). A mention of the event was found in 31 per cent of businesses searched for Black Saturday (n=24), 51 per cent of the businesses searched for the Queensland floods (n=42), and 73 per cent of the businesses searched for the Christchurch earthquakes (n=54).

Impacts on businesses

A total of 63 businesses mentioned they had suffered impacts from the events (Figure 1).

Changing market conditions i.e. demand for services or products, as a result of the event, was the most common of impacts on businesses (total n=43), followed by immediate financial loss (total n=34), business interruption losses (total n=30), loss of stock (total n=21) and longer term financial losses (total n=8).

Business categories

Figure 2 illustrates the percentage of businesses in each category that were found to have made a contribution.

56 per cent of utilities businesses (n=9) and 50 per cent of the businesses in the metals and mining category made contributions. The latter may not be representative of the wider sector given that it refers to only a single observation.

Contribution types

Overall, 63 per cent of businesses that mentioned one of the events either contributed or had otherwise supported relief efforts (n=75). 79 per cent of businesses that mentioned the Black Saturday (n=19) fires contributed towards the recovery; 64 per cent for the Queensland floods (n=27), and 54 per cent for the Christchurch quakes (n=29). A comparison of the prevalence of cash and in-kind donations for each event can be found in Figure 3.

Cash contributions were more common than in-kind contributions in two of three events (Figure 3). Examples included a biotechnology company that donated to the Victorian Bushfire Fund set up by the Australian Red Cross and the Victorian Government, and a subscription television provider that made multiple contributions to relief efforts including to an NGO following the Christchurch quakes.

Of the 56 businesses reporting a cash donation, 86 per cent of these specified the dollar amount. Table 1 shows statistics on cash contributions.

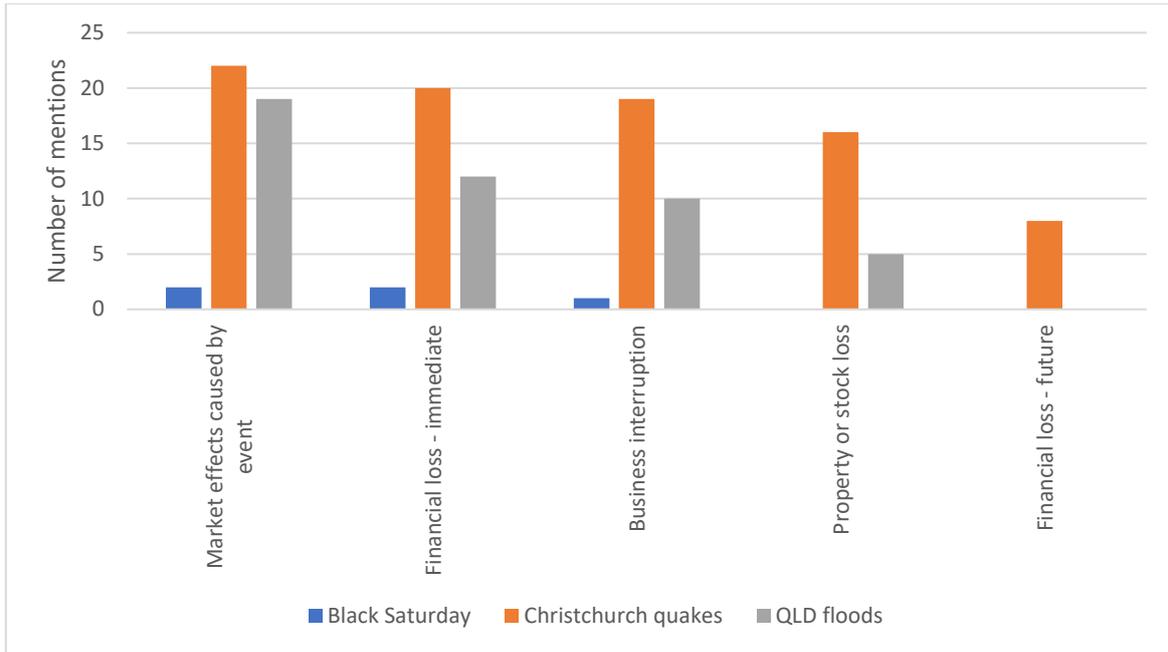


Figure 1: Impacts mentioned by event.

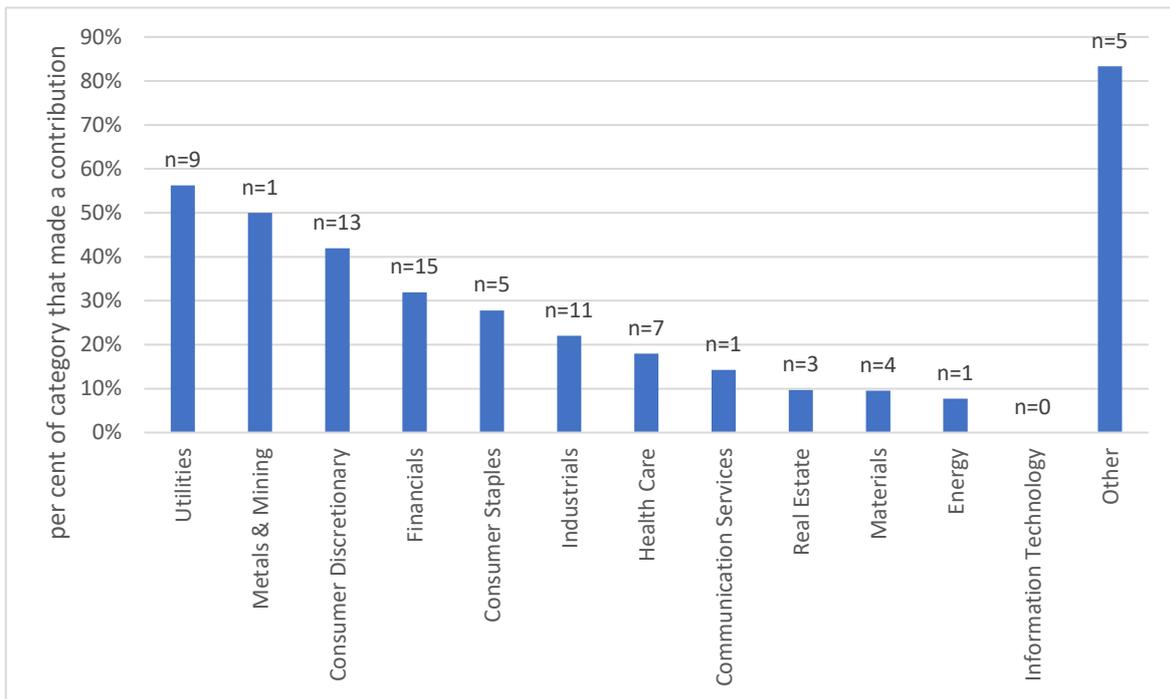


Figure 2: Percentage of businesses that made a contribution by business category.

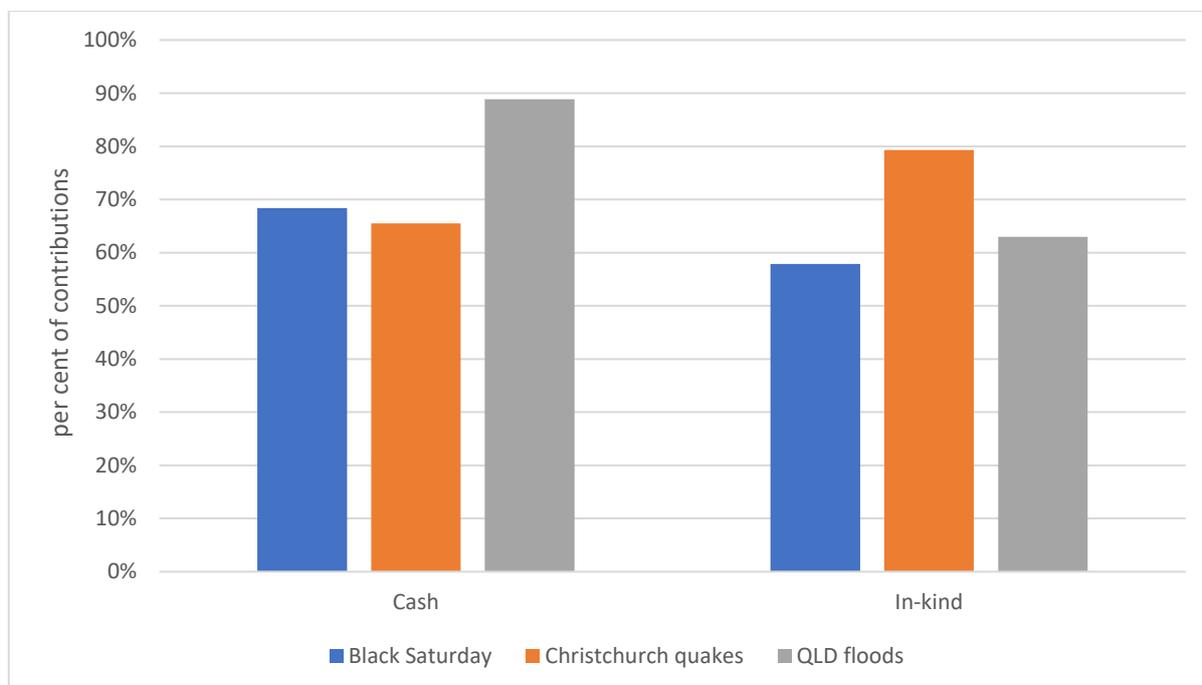


Figure 3: Contribution types by event.

Table 1: Cash contribution statistics by event. All figures are in AUD2018.

	Black Saturday	Christchurch quakes	Queensland Floods
Highest	14,070,800	12,435,634	74,165,000
Lowest	67,928	31,350	22,820
Median	1,213,000	782,367	330,320
Mean	2,161,278	2,283,895	6,083,171

The largest single contribution was AUD74 million following the Queensland floods by a major bank. The largest contribution following the Christchurch quakes was NZD12.4 million and the largest contribution following Black Saturday was AUD14 million, both made by consumer staples retail groups.

43 per cent of businesses made both cash and in-kind contributions (n=32). Overall, 68 per cent of contributing businesses made in-kind contributions: 58 per cent for Black Saturday (n=11), 63 per cent in the case of the Queensland floods (n=17), and 79 per cent for the Christchurch earthquakes (n=23). Examples included an outdoor equipment store that partnered with an NGO to make both cash and in-kind contributions to both the Christchurch earthquakes and Queensland floods.

The most frequent contributions came from financial institutions (20%, n=15). Figure 4 breaks down relative contributions made by different business sectors as a percentage of the total number of any kind of reported contribution.

More consumer discretionary, financial, health care, consumer staples, real estate and energy businesses contributed cash compared to in-kind, while the reverse was true of industrial, utility and materials businesses.

Contribution sources

Over all events, contributions were most commonly sourced directly from the business, followed by contributions from employees. More than one contribution source was identified for 31 businesses. Figure 5 shows the breakdown by event.

Where corporation support was identified, 72 per cent of businesses contributed cash (n=48); 70 per cent contributed in-kind (n=47) and 45 per cent contributed both cash and in-kind (n=30). In contrast, where business employees donated, the most frequent form of contribution were in-kind (83%, n=18). For example, staff and students from a university worked with schools to develop tools to help children deal with trauma resulting from the Christchurch earthquakes.

This was followed by cash contributions (78%, n=18) such as a financial business that contributed to various charities and community partners following Black Saturday, via both in-kind and cash contributions.

Recipients

It was possible to identify recipients of contributions in 88 per cent of all contributions (66 cases). Overall, contributions were most frequently sent directly to affected communities (62%, n=47). This was followed by contributions by way of

partnerships with NGOs (43%, n=33), such as the Red Cross Bushfire Appeal after the Black Saturday fires, and in partnership with Government (32%, n=24), such as donating to the Queensland Premier’s Disaster Relief Fund following the Queensland floods. After Black Saturday, partnerships with NGOs occurred in 55 per cent of cases (n=11) compared to only 15 per cent where businesses collaborated with Government (n=3). 47 per cent of all contributions had more than one contribution recipient (n=35). Figure 6 compares the contribution recipients identified overall and by event.

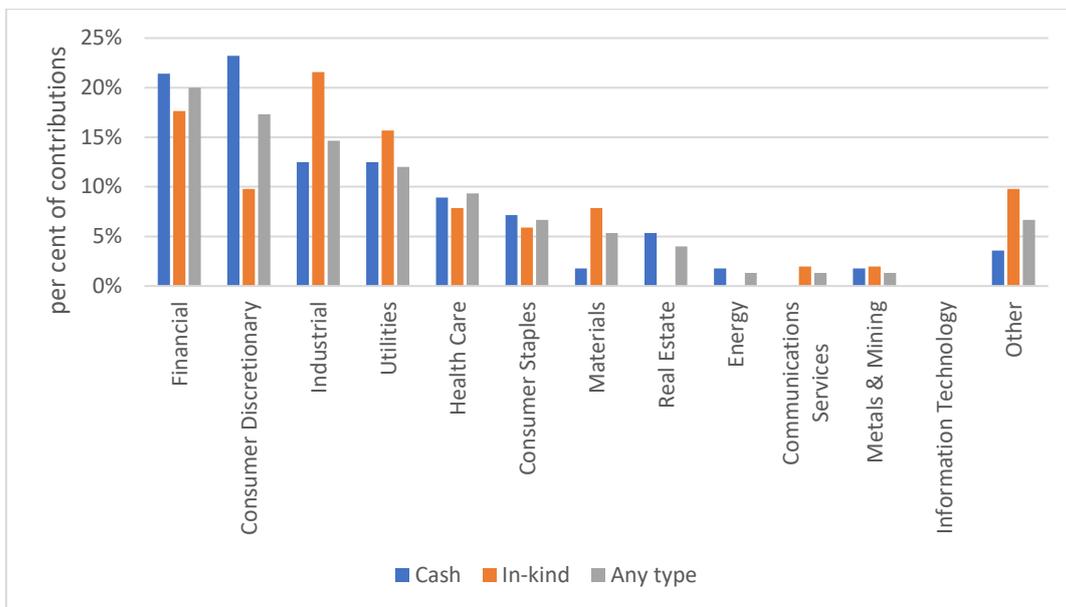


Figure 4: Business categories by contribution type.

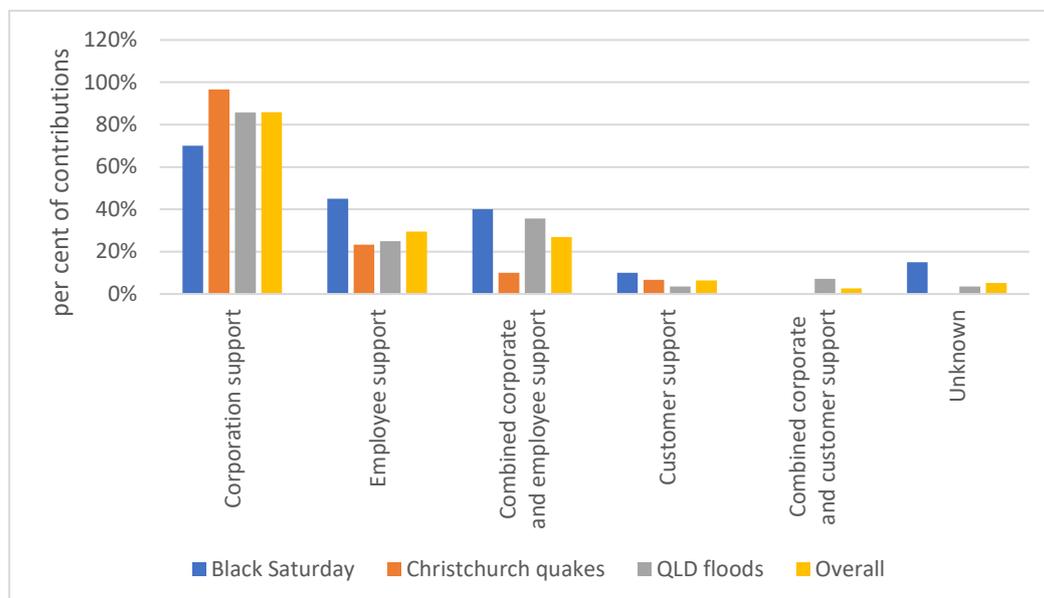


Figure 5: Contribution sources overall and by event.

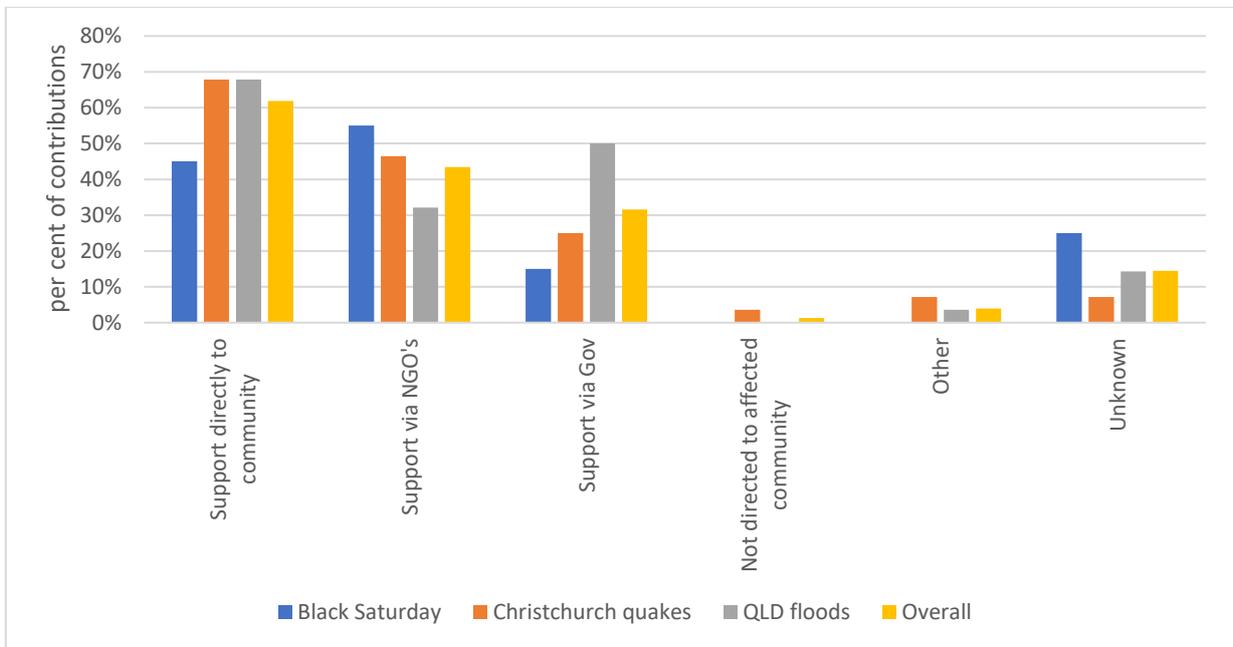


Figure 6: Contribution recipients overall and by event.

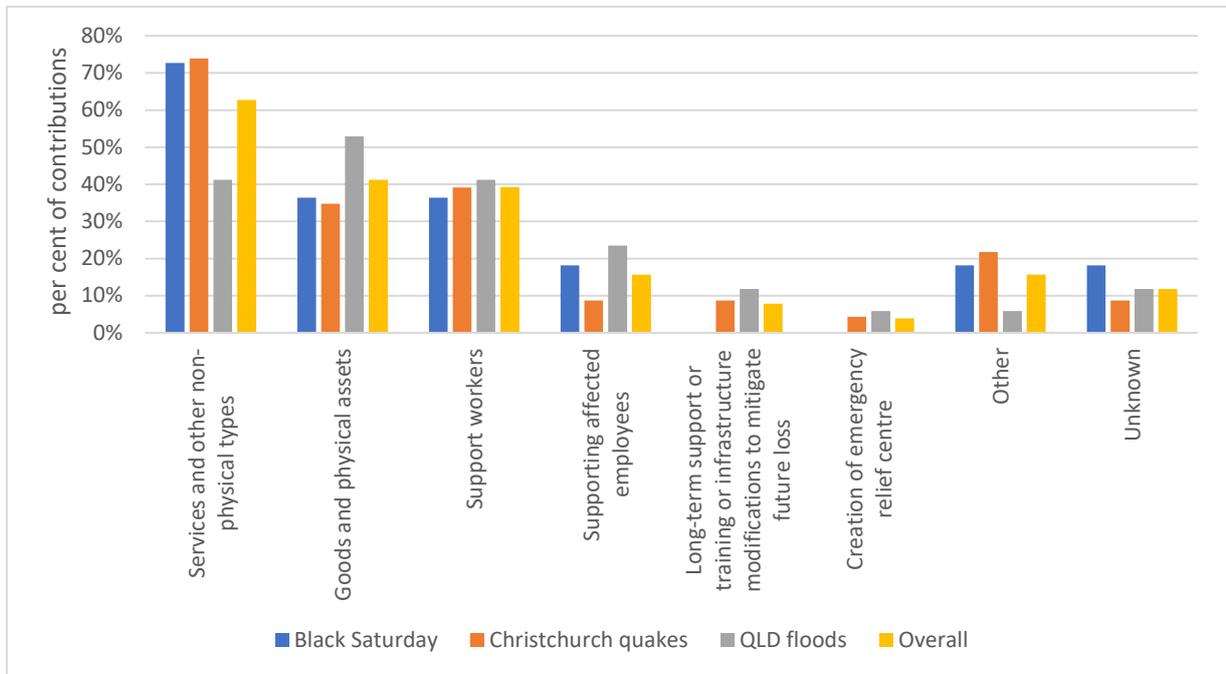


Figure 7: Contribution sub-types overall and by event.

A high proportion of contributions made directly to affected communities included an in-kind component (87 per cent, n=41). In one instance, an airline made in-kind contributions directly to affected communities by launching an initiative to provide care for affected customers. Of those that made an in-kind contribution directly to affected communities, more than half also made cash contributions (63 per cent, n=26), such as a corporation that supported relief efforts for Black Saturday via corporate donations, fundraising, volunteering and donation of goods.

In-kind contribution sub-categories

In-kind sub-types were identified for 88 per cent (n=45) of contributions that had an in-kind element. Figure 7 illustrates the relative prevalence of different sub-types as a percentage of all in-kind contributions by event.

The most common in-kind contribution was services and other non-physical types. For example, an energy business provided confidential counselling services to team members affected and transferred additional workers to assist in looking after customers.

Another energy business supported customers by waiving fees and providing grants for electricity and gas customers. A transportation business discounted fares for passengers and an airline provided flights for emergency services personnel. A common type of support by banks, utilities and communications businesses making non-physical donations was to waive or postpone fees to allow affected customers to deal with more pressing concerns. For example, during the Queensland floods, a telecommunications company waived fees for fixed payphones and supplied free mobile phones and sim cards to evacuees. Goods and physical assets (41 per cent of in-kind contributions, n=21) was next most common such as a building materials company that supplied transport and materials to support affected communities. 59 per cent of contributions had more than one in-kind subtype identified (n=30).

Reasons for support

Few businesses explicitly provided a reason for making contributions. Where reasons could be ascertained, Figure 8 shows the number of mentions.

Looking after customers was the most common intent (overall n=22). Examples were a mining business that paid for its employees to assist in the clean-up following the Queensland floods and a retail chain that justified their contributions to the Queensland Premier’s Flood Relief Appeal and Christchurch Earthquake Appeal as a demonstration of its commitment to their employees and customer base in communities where they operated.

Corporate social responsibility was next most common (overall n=21) including an industrial business that itself donated and also encouraged their employees to donate money and

supplies to communities most affected. Seven businesses contributed in order to maintain business continuity, such as an energy company that altered their supply chains and worked extended hours to reopen retail sites and truck stops in order to maintain a steady supply of fuel in Christchurch after the earthquakes. No businesses mentioned seeking profit or being required to contribute by regulation.

Discussion and conclusion

For the first time in an Australasian context we identify the degree to which large businesses have been involved in response and recovery efforts associated with severe disaster events. Despite limited efforts by authorities to involve businesses in emergency management, it is revealed that large businesses are already supporting communities. This, however, is not universal, and the potential exists to enhance the role of the business sector as part of a nationwide whole-of-community approach to emergency management.

Like in the United States (Johnson et al. 2011), businesses in Australia and New Zealand have been reactive to disasters and contributed in a range of different ways by way of cash or in-kind means. Businesses can act as conduits to coordinate support from a variety of sources including from their employees and customers. However, the business sector itself is also vulnerable to disruption in a disaster and so strong business resilience is a prerequisite for businesses supporting community needs.

Businesses mostly provided support independently in a variety of ways including directly to communities or via partnerships with NGOs rather than acting as an extension of government. Businesses also supported affected employees to resume their work-related responsibilities.

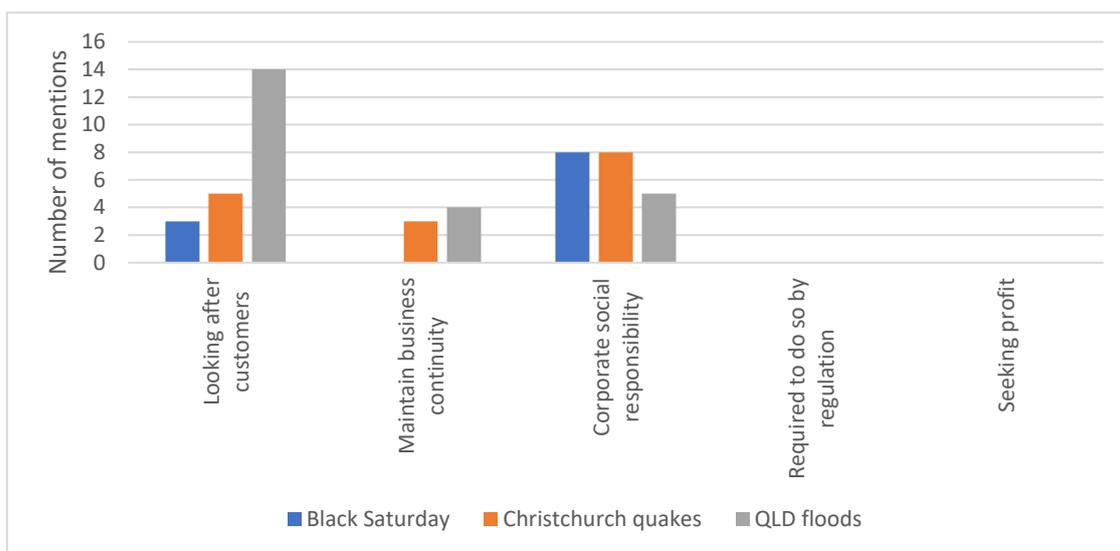


Figure 8: Reasons for support.

Johnson et al. (2011) argue that United States businesses are primarily motivated by core financial needs based on business continuity and profitability and values, the norms that society expects of businesses whereas in the Australasian examples examined here, businesses appear to have been largely motivated by a commitment to their employees and customers and by social responsibility objectives. Cash donations by Australian and New Zealand businesses may suggest that motivations are more altruistic, reflecting more complex business objectives than solely profit generation.

Our research highlights the opportunity for businesses to plan their involvement in disasters either through business continuity plans or as part of corporate social responsibility programs. These efforts may include decisions regarding preferred delivery partners and types of support that could be provided, and relationship building to support these activities. The opportunity for Government could be in informing businesses in respect of priority needs, how information may be obtained about such priorities at the time of a disaster and encouraging investment in resilience building initiatives.

Government does not need to formally activate the business sector as businesses will be reactive to the needs of their customers and employees. In this sense the relationship between businesses and government may be best defined as one of collaboration rather than direct control. Nonetheless, information sharing is vital in that it enables the business sector to best direct its efforts and to make critical business continuity decisions. Emergency management organisations can gather information from businesses who have local networks, supply chain vulnerabilities and ideas about how their capabilities can be utilised.

Mechanisms for collaboration should be included within disaster plans. This could include dedicated collaboration centres involving businesses, NGOs and government. In the United States, FEMA has developed a National Business Operations Center that acts to exchange information between Government and the business sector. During disasters, the Center provides real-time situational awareness and ground truthing on the needs of impacted communities. FEMA has also created a business sector role within its National Coordination Center to facilitate information sharing with businesses.

In Australia, Trusted Information Sharing Networks exist to facilitate sharing of information between the Commonwealth Government and critical infrastructure providers but do not provide a wider business forum for collaboration. On the positive side, the capability to work with business has been recognised in the Australian National Preparedness Framework; however, emergency managers may require upskilling to take full advantage of this capability (Gissing et al., 2018).

Further research may reveal more about the activities of businesses immediately following disaster events. Highlighting the contributions of businesses to disaster response and recovery efforts may serve to enhance motivations for business involvement. Finally, this study has focused on large

businesses and there is a need to better understand the contributions that small businesses make to disaster management.

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References

- Australian Securities Exchange 2019, *GICS - ASX 2019*. Available from: <https://www.asx.com.au/products/gics.htm>.
- Busch, N & Givens, A 2013, 'Achieving Resilience in Disaster Management: The Role of Public-Private Partnerships', *Journal of Strategic Security*, vol. 6, no. 2, pp. 1–19.
- Chandra, A, Moen, S & Sellers, C 2016, 'What Role Does the Private Sector Have in Supporting Disaster Recovery, and What Challenges Does It Face in Doing So?', *RAND Corporation*.
- Chanson, H 2011, *The 2010-2011 Floods in Queensland (Australia): Photographic Observations, Comments and Personal Experience*, University of Queensland.
- Council of Australian Governments 2011, *National Strategy for Disaster Resilience*, Canberra: Commonwealth of Australia.
- Federal Emergency Management Agency 2018, *Introduction to Public Private Partnerships*.
- GNS Science 2011, *M 6.2 Christchurch Tue, Feb 22 2011*, GeoNet 2011. Available from: <http://www.geonet.org.nz/earthquake/3468575>.
- Gissing, A, George, S, van Leeuwen, J, McAneney, J & Eburn, M 2018, 'Planning and Capability Requirements For Catastrophic Disasters - Perspectives of Australian and International Emergency Managers', *Bushfire and Natural Hazards Cooperative Research Centre, East Melbourne*.
- Haski-Leventhal, D 2013, *Natural Disaster Management in Australia: A Multi-Sectoral Approach*. Available from: http://www.mgsm.edu.au/__data/assets/pdf_file/0003/149574/CSR-Reportoct14.pdf.
- Insurance Council of New Zealand 2019, *Cost of Natural Disasters*, ICNZ, 2019. Available from: <http://www.icnz.org.nz/natural-disasters/cost-of-natural-disasters/>.
- Johnson, B, Connolly, E & Carter, T 2011, 'Corporate Social Responsibility: The Role of Fortune 100 Companies in Domestic and International Natural Disasters', *Corporate Social Responsibility and Environmental Management*, vol. 18, no. 6, pp. 352–69. Available from: <https://doi.org/10.1002/csr.253>.
- Katalyst Business 2019, *Business Profiles of New Zealand's Top 100 Companies*, March 12. Available from: http://www.katalystbusiness.co.nz/business-profiles/nz_top_100.php.

Kaufman, D, Bach, R & Riquelme, J 2015, 'Engaging the Whole Community in the United States Strategies for Supporting Community Resilience, *CRISMART*, vol. 41, pp. 151–186.

McAnaney, KJ, McAnaney, D, Musulin R, Walker G & Crompton R 2016, 'Government-sponsored natural disaster insurance pools: a view from down-under', *International Journal of Disaster Risk Reduction*, vol. 15, pp. 1 – 9.

McAnaney, J, Sandercock, B, Crompton, R, Mortlock, T, Musulin, R, Pielke Jr, R & Gissing, A 2019, 'Normalised insurance losses from Australian natural disasters: 1966–2017', *Environmental Hazards*.

NZ History 2011, *Christchurch Earthquake Kills 185*, New Zealand History. Available from: <https://nzhistory.govt.nz/page/christchurch-earthquake-kills-185>.

Queensland Floods Commission of Inquiry 2012, *Final Report / Queensland Floods Commission of Inquiry*, Queensland Floods Commission of Inquiry Brisbane.

Richman, S 2005, 'Hurricane Katrina: Government versus the Private Sector', *Freeman-new seieis-foundation for economic education*, vol. 55, no. 8, p. 4.

The Treasury, *Rebuilding Christchurch, our second-biggest city*, Budget Policy Statement 2014, Budget Priorities, The Treasury, Wellington, New Zealand. Available from: <http://www.treasury.govt.nz/budget/2014/bps/06.htm>.

Teague, B, McLeod, R & Pascoe, S 2010, *2009 Victorian Bushfires Royal Commission: Final Report*, 2009 Victorian Bushfires Royal Commission. Available from: <http://www.royalcommission.vic.gov.au/Commission-Reports>.

White, S & Lang, H 2012, *Corporate Engagement in Natural Disaster Response: Piecing Together the Value Chain*, Center for Strategic & International Studies.