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# The importance of connected communities to flood resilience

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## **THE IMPORTANCE OF CONNECTED COMMUNITIES TO FLOOD RESILIENCE**

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# THE IMPORTANCE OF CONNECTED COMMUNITIES TO FLOOD RESILIENCE

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## ABSTRACT

Floodplain risk management and emergency management will never protect all Victorian communities in all floods. There will always be some residual risk for communities, meaning that the focus will be on how they look after themselves particularly in large flood events. This self-ability to prepare, respond and recover will largely determine how quickly communities return to normal functioning – a measure of flood resilience.

There is a relatively large body of psychological research that identifies the factors determining people's flood preparedness, appropriate response and effective recovery. However, according to research into disaster resilient communities, not only is the participation of individuals required, but also collective action. Several researchers have found that community connectedness (especially 'social capital') is a critical factor in the ability of a community to recover after a disaster.

Social capital has been defined as the 'networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit' (Putnam, 1995). Research into recent disasters around the world, such as the 2004 Indian Ocean tsunami and Hurricane Katrina, has shown the benefits of social capital in providing resources for a faster and more efficient recovery. Some recent post-flood evaluations conducted in Victoria also indicate the importance of social capital in flood response and recovery. Research by the Victorian Department of Planning and Community Development has shown the need for social capital formation in building general community resilience across the state.

There are several implications of these findings for floodplain and emergency agencies including the need to work with community developers in state and local government to assess and strengthen community connections through social capital formation in flood-prone Victorian communities. This should be done as a preparation for flooding to enable the different types of social capital to work in communities during and after a flood.

Another implication is that community flood education and engagement programs such as FloodSafe should include content that helps people and communities learn how to form and use social capital as part of flood preparedness.

## **Introduction**

The Victorian Government has recently signalled a strong commitment to build community resilience across the state, including for flood. The Victorian Emergency Management Reform White Paper (Victorian Government, 2012) has 'building community resilience and community safety' as one of its strategic priorities. It notes that 'a disaster-resilient community has the inherent capacity to deal with any shock, no matter how well-anticipated or surprising' (p. 4).

The community resilience focus of the White Paper is partly a result of the final reports of the 2009 Victorian Bushfires Royal Commission and the Review of the 2010-11 Flood Warnings and Response. It is also in recognition that 'Victoria's emergency management arrangements operate within a national context that incorporates the National Strategy for Disaster Resilience (NSDR)' (Victorian Government, 2012, p. 4).

The purpose of the NSDR is to 'provide high-level guidance on disaster management to federal, state, territory and local governments, business and community leaders and the not-for-profit sector. While the NSDR focuses on priority areas to build disaster resilient communities across Australia, it also recognises that disaster resilience is a shared responsibility for individuals, households, businesses and communities, as well as for governments. The NSDR is the first step in a long-term, evolving process to deliver sustained behavioural change and enduring partnerships' (Attorney-General's Department website: [www.ag.gov.au](http://www.ag.gov.au)).

The Victorian White Paper largely focuses on improving community engagement, education and awareness, community-based risk mitigation planning, business continuity planning and provision of warning information to build community resilience. However, this paper presents evidence demonstrating that forming more connected communities for disasters should also be a main action in the state's disaster community resilience-building. It also provides suggestions for Victorian floodplain and emergency managers to better connect communities to help build flood resilience.

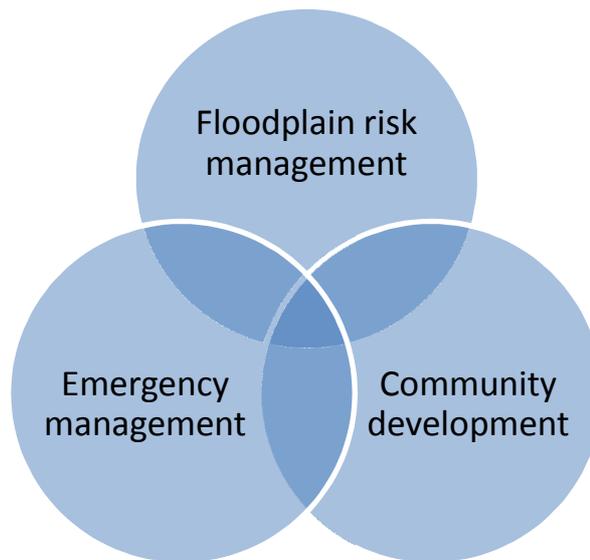
## **A flood resilience framework**

A flood resilience framework is developed below to help identify the strategic importance of having connected communities.

The Victorian White Paper recognises the complex interactions required between disaster risk reduction (DRR), emergency management and communities to build disaster resilience. 'The conventional "top down" approach to emergency management is changing. Governments in Australia and around the world now recognise the importance of local involvement in emergency management, particularly in planning and mitigation. Local knowledge on people, history, risks, vulnerability, operational requirements, infrastructure and services significantly enhances emergency preparation, response and recovery' (p. 4).

These complex interactions are stressed by other key Australian documents. For example, the National Climate Change Adaptation Research Plan for Emergency Management (Pearce et al, 2009, p. 4) states that 'When natural disasters occur, the consequences of damage and loss are a function of the effectiveness of the disaster mitigation strategies that have been implemented, the activities of the emergency services, and the resilience of the communities and economic sectors affected.'

Based on this, a flood resilience framework should involve at least floodplain risk management, emergency management and community development. This resilience-building triumvirate is shown as a Venn diagram in Figure 1. It should be noted that there are other important fields that could be coupled to this strategic triumvirate e.g. 'economic input' (e.g. insurance, financial aid) for the flood recovery phase.



*Figure 1 – Three fields required to build community flood resilience*

Whilst the interactions between floodplain risk management and emergency management are well-established in Victoria (e.g. through legislation, plans, policies) and should be improved based on the White Paper, their interrelationships with communities are less understood.

In relation to floods and other hazards, ‘communities’ should not be only viewed as geographic places or neighbourhoods, but also as connective networks, including those based on people’s common interests (Dickinson, 2012). An understanding of how flood-affected communities will interact with floodplain risk management and emergency management (as shown in Figure 1) requires research drawing on the ‘community development’ disciplines of education, psychology and sociology (Dufty, 2012). Education will provide an understanding of how people learn; psychology how people behave; and, sociology how people connect. It is the latter discipline that is the focus of this paper.

### **Disasters and social capital**

There is a growing body of sociological evidence that demonstrates the importance of connected communities in building community disaster resilience. Of particular significance is the role of ‘social capital’.

Social capital has been defined as the ‘networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit’ (Putnam, 1995). It consists of those bonds created by belonging to a group that instills trust, solidarity, and cooperation among members.

It is generally agreed that there are three distinct forms of social capital:

1. ‘Bonding social capital’ grows from organisations and activities connecting similar individuals who often live in close proximity to each other e.g. neighbours, friends, families.
2. ‘Bridging social capital’ grows from bringing together individuals from different neighbourhoods, ethnicities and races e.g. through employment, education, sporting club, church.
3. ‘Linking or governance social capital’ grows from linking individuals and organisations to institutions to enable them to make decisions about the management and distribution of a community’s overall resources. This could include volunteering for an emergency agency and participation on a local council committee. Where bridging social capital connects

individuals of approximately equal social status, linking social capital connects those of unequal status, providing them with access to power.

Figure 2 illustrates these three types of social capital along axes of horizontal and vertical distance.

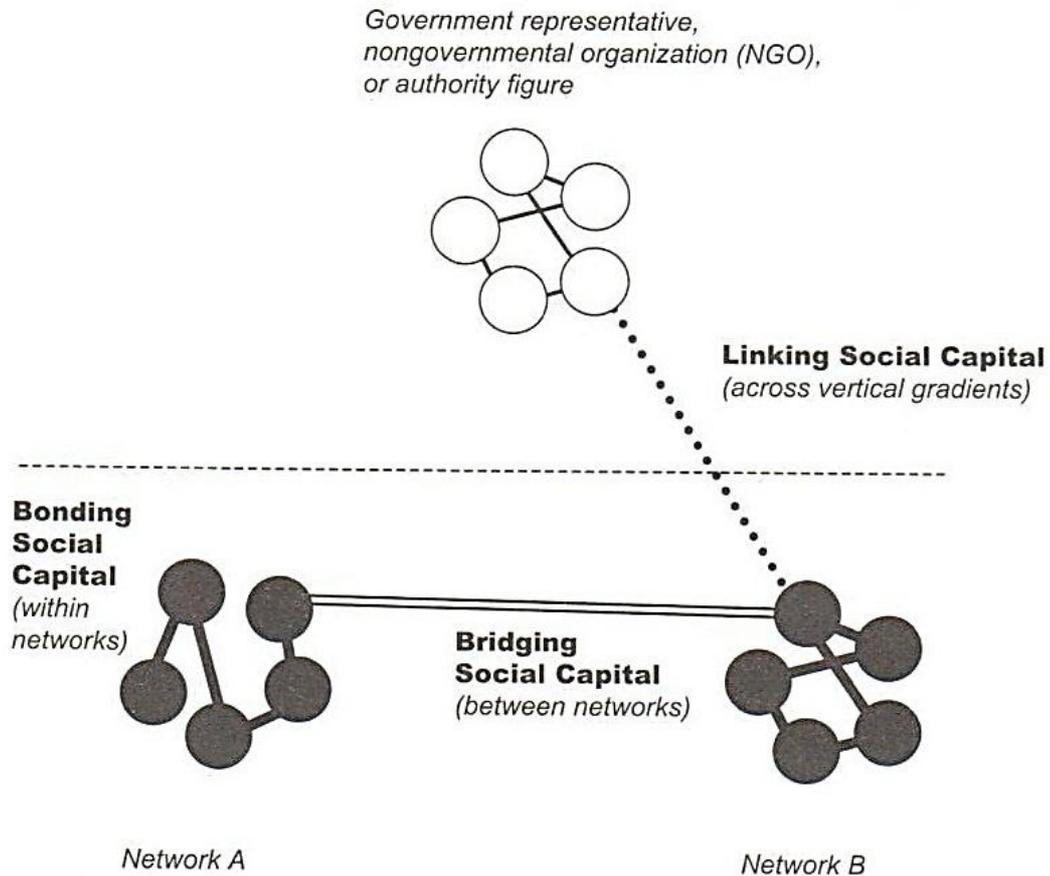


Figure 2 – Bonding, bridging, and linking social capital (from Aldrich, 2012, p. 34)

The importance of social capital in disasters has been well documented. For example, according to Schellong (2007), during and after a disaster “social systems continue to operate while new ones emerge because they have greatest knowledge of the community, and because they need to initiate recovery themselves as many of their needs will not be met by outside agencies”. Haines, Hurlbert and Beggs (1996) found that disaster victims and their social networks mostly become resources that can be used in disaster recovery.

Research into the recovery from recent disasters such as the 2004 Indian Ocean tsunami (e.g. Aldrich, 2011a), the Haiti Earthquake (e.g. Nolte and Boenigk, 2011) and Hurricane Katrina (e.g. Boettke et al, 2007; Chamlee-Wright, 2010) has shown the benefits of social capital in providing resources for a faster and more efficient recovery.

However, there were some negative effects of social capital found in the research. For example, in villages in Southeast India impacted by the 2004 tsunami, although high levels of social capital reduced barriers to collective action for members of the *uur* panchayats (hamlet councils) and parish councils speeding up their recovery and connecting them to aid organisations, at the same time social capital reinforced obstacles to recovery for those outside of these organisations such as women, Dalits, migrants, and Muslims (Aldrich, 2011a).

In his recent book *Building resilience: social capital in post-disaster recovery*, Associate Professor Daniel Aldrich posits that ‘high levels of social capital – more than such commonly referenced factors as socioeconomic conditions, population density, amount of damage or aid – serve as the core engine of recovery’ (Aldrich, 2012, p. 15). Using qualitative and quantitative evidence, Aldrich proved this hypothesis to be correct for four disasters he studied around the world. ‘Despite different time periods, cultures, government capacities, and levels of development, all four cases showed that areas with more social capital made effective and efficient recoveries from crises through coordinated efforts and cooperative activities’ (Aldrich, 2012, p.149).

Based on this research, Aldrich (2012, pp. 149-151) identified three mechanisms in which social capital provides resilience before, during and after disasters:

1. Deep levels of social capital serve as informal insurance and promote mutual assistance after a disaster.
2. Dense and numerous social ties help survivors solve collective action problems that stymie rehabilitation.
3. Strong social ties strengthen the voices of survivors and decrease the probability of leaving.

### **Relevance to Victorian floods**

Although there is a growing body of evidence from around the world, there has been no specific research conducted to test the importance of forming social capital before, during and after Victorian floods.

However, there is some Victorian social research that does provide an insight into the importance of social capital in Victorian community flood resilience. In 2004 and 2008, the Victorian Government conducted surveys about community strength (resilience) across all Local Government Areas (LGAs). Included in the resilience indicators surveyed were ‘being able to have a say on local issues’, ‘volunteering’, and ‘having networks of people who can provide support in a crisis’. The use of these and the other indicators informed research carried out by the Victorian Government that showed why social capital can build more resilient families and communities (Department of Planning and Community Development, 2011).

Table 1 provides a summary of the 2008 community strength survey results that are particularly relevant to flood and other hazard resilience. It links the appropriate community strength indicators with the three types of social capital shown in figure 2.

The community strength research across LGAs can be used by Victorian floodplain and emergency managers to help understand and predict the ability of Victorian communities to work together during and after a flood event. It should be noted that the indicators are a tool for community planning, and not a report card, as they are affected by the combined actions of government, business and the community.

Some social research related to recent flooding in Victoria also provides an insight into aspects of social capital in flood-affected communities. For example, in research into the March 2012 North East Victoria Flood (Office of the Emergency Services Commissioner, 2012), survey respondents were asked if they felt they could keep their families safe and help their neighbours in the flood (‘bonding capital’). Across the study area, 87% of respondents thought they could keep their family safe and 79% would help their neighbours. During the flood, of the half that took action, 88% said they checked on family and friends and 54% checked on vulnerable people. Prior to the flood, about one-third of respondents (43% in Nathalia) said they had been involved with local government and state government agencies in flood planning (‘linking social capital’).

Table 1 – Summary of some relevant indicators from the 2008 Victorian community strength survey

Indicator	Victoria	Regional Victoria	Metropolitan Melbourne
Can get help when needed ('bonding social capital')	91%	92%	91%
Membership of organised groups ('bridging social capital')	61%	64%	59%
Participation in organised sport ('bridging social capital')	41%	43%	40%
Volunteering ('linking social capital')	33%	43%	28%
On decision-making board or committee ('linking social capital')	19%	23%	17%

Source: Department of Planning and Community Development (2010)

Research into the use of social media in the 2011 Victorian floods may also indicate the importance of social capital in both geographic communities and broader communities of interest. Several researchers (e.g. Antoci et al, 2011; Ellison et al, 2007) have assessed the value of social media in forming social capital. They found that social media have made it simpler to interact with others without the limitations of geography and lack of time. 'Noting that contact through social media is asynchronous, they reference studies which show that such interactions are not necessarily of inferior quality compared to simultaneous, face-to-face, interactions' (Tibbitt, 2011). In addition to the preservation and possible improvement of existing ties, interaction through social media can foster the creation of new relations.

Research into the use of social media in the 2011 Victorian floods (Alliance Strategic Research, 2011) reviewed 320,000 comments related to the floods. It showed that through the social media networks people were finding out about the well-being of families and friends, providing emotional support, spreading warning messages (including from VICSES) and offering help. Most of the social media network activities were examples of bonding social capital (e.g. friends and family finding out about the well-being of and lending support to flood-affected people) and bridging social capital (e.g. people offering help during the recovery phase). Examples where people and their networks assisted in the decision-making of emergency agencies (e.g. through volunteering, providing real-time information called 'crowdsourcing') could be viewed as being a form of linking social capital.

### Implications for floodplain and emergency managers

Given that it appears that social capital is an important factor in Victorian community flood resilience, what are the implications for floodplain and emergency managers?

As a result of research findings, Aldrich (2011b) suggests that, 'Rather than imagining that disaster mitigation and recovery are functions of characteristics external to the community – such as aid provided by the government or nongovernmental organizations, the amount of damage from the crisis, or the competency of local and national political leaders – scholars should recognize that the level of connectedness and cohesion within the neighbourhood is critical to recovery.' Like two individuals exposed to the same disease, recovery may have more to do with the quality of the host than the nature of the disease (Aldrich, 2008).

More specifically, Aldrich (2012, p.151-166) argues that:

1. Centralised plans for recovery are ambitious and typically flawed. 'Without the acceptance of local residents, top-down disaster plans will merely sit on the shelves gathering dust or

will be implemented in the face of strong resistance from communities who feel ignored or harmed by such schemes’.

2. Existing recovery and mitigation plans at best ignore and at worst harm the stocks of social capital. For example, ‘evacuation plans should keep survivors connected during and after evacuation’.
3. Decision makers in the public and private sector must design and apply new policy instruments that strengthen social capital before and after a crisis.

Although, the first two arguments have relevance to Victorian flood resilience and should be considered in future emergency management planning, it is the last one that requires further discussion.

There are some excellent examples of social capital formation in Victorian emergency management including the extensive volunteer base of the Country Fire Authority (CFA) and the Victorian State Emergency Service (VICSES). Groups such as Community Fireguard and followers/friends of the emergency agency social media sites are examples of social capital formed prior to flood, fire and other emergencies. However, more capacity building needs to be done as only a relatively small proportion of people living in Victorian flood communities are linked directly through these volunteering relationships.

After being made aware of the above evidence, one Victorian emergency manager commented to this author, ‘We need to continue to build disaster resilience social capital in our communities, including through the local footy club, church and school’. To do this it is suggested that emergency managers work with state and local government community development staff to further build social capital networks for disasters in Victorian communities. One way to do this may be through the local community resilience committees as promoted in the Victorian White Paper.

The Victorian White Paper also promotes the use of engagement and education in disaster resilience. Apart from encouraging appropriate personal and business behaviour in relation to floods, engagement and education programs such as the FloodSafe should also provide learning related to how to form and use social capital before, during and after a flood (Dufty, 2012). This learning could be as simple as remembering to check on and help neighbours and vulnerable people during and after a flood. ‘Recovery will depend as much, if not more, on the support provided by neighbours and friends as on the help of strangers’ (Darcy, 2004, p.5).

There are several websites that provide ways for people to learn how to form social capital including <http://www.bettertogether.org/150ways.htm>. An example of a program to improve life after a disaster through the use of social capital formation is the Neighbourhood Partnerships Network in New Orleans (see <http://www.npnnola.com/about/>).

As discussed above, social media should be used to build communities of interest before, during and after a flood. With over 11 million Facebook accounts and two million Twitter accounts (Social Media News, 2012), Australians are large users of social media. Existing social media initiatives of VICSES and the CFA that link with these social networks should be further developed, particularly to build bonds and trust between users prior to a flood and support for others during and after a flood. Useful websites to learn more about using social media for disasters include <http://www.sm4em.org/> (#smem on Twitter) and <http://emergency20wiki.org/>.

There is also potential in urban infrastructure design and development that can influence the levels of social capital in a community. Scholars such as Oscar Newman (Newman, 1996) have advocated designing housing so that local residents adopt it as their own territory, enforcing their norms and creating respect for the property and security of their neighbours. This should be a consideration in future development in flood-prone urban sites e.g. in metropolitan Melbourne.

## Conclusion

This paper introduces the need to connect communities for flood resilience, particularly through social capital formation. It presents evidence from disasters around the world demonstrating that social capital is a significant factor in community resilience, although there are potential downsides of high levels of social capital. It also provides indications from Victoria of the importance of social capital in Victorian communities including for flood resilience.

The paper then identifies four ways in which social capital can be formed to assist in flood resilience.

1. Increasing the relationships between emergency managers, communities and individuals through community development and strengthening activities at the state and local levels.
2. Including in engagement and education activities learning about forming and using social capital (e.g. helping neighbours, vulnerable people, working through clubs) for before, during and after flood events.
3. Further developing information exchange and online self-help networks through interactions between floodplain and emergency managers and social media users.
4. Considering urban design that is conducive to social capital formation in future development in floodplains.

In general, the paper highlights a strategic oversight in not only current Victorian floodplain and emergency management, but also in future plans as outlined in the Victorian White Paper. The tendency is to concentrate on 'the community' as the sum of people's behaviours, rather than also focussing on what brings them together.

## References

- Aldrich, D.P., 2008, The Crucial Role of Civil Society in Disaster Recovery and Japan's Emergency Preparedness, *Japan aktuell*, Vol. 3, pp.81-96.
- Aldrich, D.P., 2011a. The Externalities of Social Capital: Post-Tsunami Recovery in Southeast India, *Journal of Civil Society*, Vol. 8, No. 1, pp. 81-99.
- Aldrich, D. P., 2011b, Between Market and State: Directions in Social Science Research on Disaster, *Perspectives on Politics*, Vol. 9, No. 1, March 2011 pp. 61-68.
- Aldrich, D.P., 2012, *Building resilience: social capital in post-disaster recovery*, University of Chicago Press, Chicago.
- Alliance Strategic Research, 2011, *Social media in the 2011 Victorian floods*, report for VICSES and the Office of the Emergency Services Commissioner.
- Antoci, A., Sabatini, F., & Sodini, M., 2011, *Bowling alone but tweeting together: the evolution of human interaction in the social networking era*, Sapienza University of Rome, mimeo.
- Boettke, P., Chamlee-Wright, E., Gordon, P., Ikeda, S., Leeson, P.T., & Sobel, R., 2007, The Political, Economic, and Social Aspects of Katrina, *Southern Economic Journal*, Vol. 74, No. 2, pp. 363-376.
- Chamlee-Wright, E., 2010, *The Cultural and Political Economy of Recovery: Social Learning in a Post-Disaster Environment*, Routledge, New York.
- COAG, 2011, *National Strategy for Disaster Resilience: Building our nation's resilience to disasters*, Australian Government.
- Darcy, J., 2004, *The Indian Ocean Tsunami Crisis: Humanitarian Dimensions*, Working paper, Humanitarian Policy Group.
- Department of Planning and Community Development, 2011, *Indicators of community strength in Victoria: framework and evidence: Why social capital can build more resilient families and communities*. Victorian Government

- Dickinson, S., 2012, *People on the move: why the term 'community' is not synonymous with 'neighbourhood'*, Bushfire CRC poster available at [http://www.bushfirecrc.com/managed/resource/sondra\\_dickinson\\_revised\\_170712.pdf](http://www.bushfirecrc.com/managed/resource/sondra_dickinson_revised_170712.pdf)
- Dufty, N., 2012, *Learning for disaster resilience*, Proceedings of the Australian & New Zealand Disaster and Emergency Management Conference held in Brisbane, Qld, April 2012, pp.150-164
- Ellison, N. B., Steinfield, C., & Lampe, C., 2007, The benefits of Facebook friends: Social capital and college students' use of online social network sites, *Journal of Computer-Mediated Communication*, Vol.12, pp. 1143-1168.
- Haines, V.A., Hurlbert, J.S., & Beggs, J.J. 1996, Exploring the Determinants of Support Provision: Provider Characteristics, Personal Networks, Community Contexts, and Supporting Following Life Events, *Journal of Health and Social Behavior*, Vol. 37, No. 3, pp.252-264.
- Newman, O., 1996, *Creating Defensible Space*, Washington DC: US Department of Housing and Urban Development, Office of Policy Development and Research.
- Nolte, I., and Boenigk, S., 2011, *Public-Private Partnership Performance in a Disaster Context: The Case of Haiti*, Public Administration Review.
- Office of the Emergency Services Commissioner, 2012, *2012 North East Victoria Flood Review*, Victorian Government.
- Pearce T, Handmer J, Higgins J, King D, McDonald J, Pagano F, Schneider J, Whetton P, 2009, *National Climate Change Adaptation Research Plan for Emergency Management*, National Climate Change Adaptation Research Facility, Gold Coast, 44pp.
- Putnam, R., 1995, Bowling Alone: The Collapse and Revival of American Community, *Journal of Democracy*, Vol. 6, pp. 65-78.
- Schellong, A., 2007, *Increasing Social Capital for Disaster Response through Social Networking Services (SNS) in Japanese Local Governments*, National Centre for Digital Government No. 07-005.
- Social Media News, 2012, *Social Media Statistics Australia – September 2012*, available at <http://www.socialmedianews.com.au/social-media-statistics-australia-september-2012/>
- Tibbitt, J., 2011, *Social media, social capital and learning communities*, blog published on PASCAL International Observatory website <http://pascalobservatory.org>.
- Victorian Government, 2012, *The Victorian Emergency Management Reform White Paper*.