Using social media to build community disaster resilience

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ABSTRACT

Several emergency management researchers and practitioners have suggested that the use of social media can help build community disaster resilience. This article develops a strategic framework for the social aspects of disaster resilience-building based on the Australian National Strategy for Disaster Resilience. It then investigates the current and potential use of social media related to the strategic framework. The article concludes by discussing the possible implications for emergency managers of using social media within such a framework.

Introduction

'Social media' and 'resilience' are two terms that now regularly appear in the emergency management literature. Several researchers in the emergency management field believe that using social media will help build community disaster resilience. For example, White (2012, p. 187) states that "community resilience should include a grassroots effort where social media is used in a number of ways to support the safety of the community." Dufty (2011) promotes the use of social media by emergency agencies to assist in "learning for disaster resilient communities".

Although these and other researchers and practitioners provide some mechanisms and practical tips in the use of social media to build community disaster resilience, further investigation is required to review the full potential of the relationship.

Using current definitions of community resilience this article identifies a strategic framework for communities, emergency managers and other organisations to help build disaster resilience. It then explores ways in which social media can be effectively used to support this framework. The article concludes by discussing issues faced by emergency agencies in their use of social media, particularly in relation to their education, communications and engagement (ECE) activities.

Building community disaster resilience

The concept of resilience has been in the disaster management literature since the 1980s (Wildavsky, 1988) but has come into vogue as an overriding goal in the past ten years. This has been mainly due to its importance as a factor in achieving sustainability (Dovers, 2004), its role as a strategy in climate change adaptation and as a perceived requirement for communities in the wake of disasters such as 9/11 and Hurricane Katrina (Boin, Comfort and Demchak, 2010).

Like the term 'sustainability', there are a multitude of definitions of 'disaster resilience'. The original notion of resilience, from the Latin word resilio, means to 'jump back' or 'bounce back'. According to de Bruijne, Boin and van Eeten (2010), "In the past decades, research on resilience has been conducted at various levels of analysis – the individual level, the group level, and the organisational or community level – in a wide variety of disciplines including psychology, ecology, organization and management sciences, group/team literature and safety management." Several researchers (e.g. Longstaff, 2005) have made an interdisciplinary effort to further refine the concept of resilience in relation to disaster management. However, a dilemma for researchers has been whether disaster resilience should involve the ability of a community to 'bounce back' (i.e. resume its normal functioning) as per the original notion, or to 'bounce forward' after a disaster (Manyena et al, 2011). Some researchers such as Paton (2006a) opt for the latter notion arguing that the 'bounce back' idea neither captures the changed reality after a disaster, nor encapsulates the new possibilities wrought by a disaster.

Although the academic debate continues on what precisely disaster resilience is (and its relationship to 'vulnerability'), governments around the world have developed strategic plans that aim to guide communities and emergency agencies towards achieving it. For example, the Hyogo Framework for Action was an outcome of the 2005 World Conference on Disaster Reduction held in Kobe, Japan. One of its five specific priorities for action was "building a culture of safety and resilience".

In December 2009, the Council of Australian Governments (COAG) agreed to adopt a whole-of-nation, resilience-based approach to disaster management, which recognises that a national, coordinated and cooperative effort is needed to enhance Australia's capacity to prepare for, withstand and recover from disasters. The National Emergency Management Committee subsequently developed the National Strategy for Disaster Resilience which was adopted by COAG on 13 February 2011.

The purpose of the Strategy 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 Strategy 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 Strategy 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).

The Strategy (COAG, 2011) identifies seven groups of actions to build community disaster resilience in Australia:

1. Leading change and coordinating effort
2. Understanding risks
3. Communicating with and educating people about risks
4. Partnering with those who effect change
5. Empowering individuals and communities to exercise choice and take responsibility
6. Reducing risks in the built environment
7. Supporting capabilities for disaster resilience.

The following three disaster resilience-building 'fields' were identified after analysing and further categorising the seven actions, and from other research (e.g. Paton, 2006b):

1. Disaster risk reduction
2. Emergency management
3. Community development.

One could argue the value of this division. For instance, why separate 'disaster risk reduction' from 'emergency management' when Prevention, Preparedness, Response and Recovery (PPRR) in emergency management could encapsulate both? One reason is that it distinguishes hazard risk mitigation (prevention) activities from preparedness activities, the boundaries of which are which are sometimes confused. According to Topping (2011), "Mitigation is distinguished from preparedness by its emphasis on creating long-term resilience through permanent modification of physical and other circumstances which create risk and vulnerability. Yet mitigation is widely misunderstood, often confused with preparedness - and not just by news media and the general public."

The distinction between disaster risk reduction and emergency management is demonstrated practically in several parts of Australia through the demarcation of responsibility and activity. For example, in NSW, floodplain risk management is primarily the responsibility of local councils, with the NSW State Emergency Service responsible for flood preparedness and response.

Educationally, the distinction between risk mitigation and emergency management is also apposite. A common fallacy in the design of disaster-related community ECE programs is that risk awareness will directly lead to preparedness and then appropriate response and recovery behaviours. Research (e.g. Boura, 1998; Rhodes, 2011) has shown that this linear logic process does not exist, and that 'critical awareness' is a part of several psychological processes determining preparedness (Paton, McClure and Burgelt, 2006). Thus ECE activities should target risk awareness and preparedness learning outcomes separately.

Why include 'community development' in the resilience-building mix? Several researchers (e.g. Paton, 2006b) believe that risk reduction and emergency management by themselves will not necessarily build disaster resilience in communities. They feel that social interactions, competencies and interactions improved by 'community development' activities form a critical part of the resilience-building triumvirate.

A relationship between the three disaster resilience-building fields is shown using the simple Venn diagram in Figure 1. Depending on the resilience 'profile' of a community, the importance of each field can be larger and smaller, and their linkages more critical (and thus not necessarily equal as shown in Figure 1).

Figure 1. Interrelationship of the three fields required to build community disaster resilience.

Social media

The term 'social media' refers to internet-based applications that enable people to communicate and share resources and information. Examples of social media include blogs, discussion forums, chat rooms, wikis, YouTube, Channels, LinkedIn, Facebook and Twitter.

The use of social media in recent disasters (e.g. 2010 Haiti earthquake, 2011 Queensland floods, 2011 Japan earthquake) around the world has been well documented (Palen, Vieweg, Liu, & Hughes, 2009; Liu, Iacucci, & Meier, 2010; Queensland Police Service, 2011; White, 2012). Some researchers such as Yates and Paquette (2010) even suggest that "disaster response may be the ideal environment for 'proving the worth' of social media as a serious knowledge management platform".

Returning to the three fields identified above (see Figure 1), social media have already demonstrated their use in the emergency management field but have potential in the two other fields, and thus in helping build community disaster resilience. This is because social media can easily form 'communities of practice' across the three resilience-building fields before, during and after an event. According to Wenger (2006), "communities of practice are groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly".

By further developing the disaster resilience-building framework (see Figure 2), the value of social media can be explored. Figure 2 shows the three fields linked to arguably their main 'social' goals.

The main goal of the disaster risk reduction field is identified here as 'minimising residual risk'. According to the United Nations International Strategy for Disaster Reduction (http://www.unisdr.org/we/inform/terminology), residual risk is "The risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained". Social media can help people understand the residual disaster risks in their communities, and what is being done (structural and non-structural methods) to manage this risk. Several organisations around the world are using social media to engage with communities of interest to discuss ways to reduce disaster risk (e.g. Alabama Department of Homeland Security, 2010).

A main goal of emergency management is to ensure community safety though 'shared responsibility'. The concept of 'shared responsibility' is explained in the final report of the Royal Commission into the 2009 Victorian Bushfires in Australia. The Commission uses the expression 'shared responsibility' to mean increased responsibility for all. It recommends that state agencies and municipal councils adopt increased or improved protective, emergency management and advisory roles. In turn, communities, individuals and households need to take greater responsibility for their own safety and to act on advice and other cues given to them before and on the day of a bushfire.

According to the Royal Commission report, "Shared responsibility does not mean equal responsibility.....there are some areas in which the government should assume greater responsibility than the community. For example, in most instances fire authorities will be more capable than individuals when it comes to identifying risks associated with a fire; the government should therefore assume greater responsibility for working to minimise those risks".

The Australian Government stresses in its National Strategy for Disaster Resilience (COAG, 2011) that "achieving disaster resilience is not solely the domain of emergency management agencies; rather, it is a shared responsibility across the whole of society".

Figure 2. Goals and ways that social media can help build community disaster resilience.

Disaster risk reduction	Emergency management	Community development
• **Goal: 'Minimisation of residual risk'**	• **Goal: 'Safe communities through shared responsibility'**	• **Goal: 'Formation of social capital for disasters'**
• Informing others of disaster risks	• Providing emergency intelligence through crowdsourcing	• Increasing and improving social networks, leadership and support systems
• Discussing and planning ways to minimise risk	• Helping people prepare for disasters	• Providing support to people during and after a disaster
• Coordinating and managing tasks	• Communicating warnings to others	• Conducting post-event learning to improve
• Conducting post-event learning to improve	• Coordinating community response and recovery	
	• Conducting post-event learning to improve	

As Keim and Noji (2011) state, "social media rely on peer-to-peer (P2P) networks that are collaborative, decentralised and community driven. They transform people from content consumers into content producers". Thus, by their very nature, social media can build emergency management communities of interest that share responsibilities. They can be aligned to a particular disaster or a community that is at risk of disaster. They can also consist of emergency managers including first responders (e.g. Social Media 4 Emergency Management at www.sm4em.org or #smem on Twitter).

A main goal for community development, particularly related to disaster resilience, is the 'formation of social capital'. Social capital broadly refers to the resources accumulated through the relationships among people (Coleman, 1988). "There is consensus that social capital consists of resources embedded in social networks and social structure, which can be mobilized by actors" (Dynes, 2002). 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.

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. It therefore can encourage and sustain learning communities (Tibbitt, 2011) and, in this case, 'disaster resilience learning communities'.

Based on the disaster resilience-building framework previously discussed in this paper, there are several ways (see Figure 2) to use social media to build community disaster resilience. These include:

- Developing social capital (e.g. networks, leadership, support systems) for disaster resilience learning communities
- Informing others of the disaster risks in their community, discussing and planning what is being done to manage the risks and what they can do
- Engaging with others to help them prepare for a disaster
- Providing intelligence through 'crowdsourcing' to others (including emergency managers) before, during and after a disaster
- Communicating warnings and other information to communities during a disaster
- Providing support to people during and after a disaster
- Coordinating community response and recovery
- Conducting post-event learning to further build resilience (this is critical for impacted communities to 'bounce forward').

Implications for emergency managers

Although it appears that social media can help build the social aspects of disaster resilience, the framework for this interrelationship promoted above will have implications for emergency managers.

Firstly, the framework calls for emergency agencies to liaise not only with risk managers but with those involved in community development such as social scientists, psychologists and community planners. Although these experts are usually involved in disaster recovery actions, this framework encourages liaison and planning by all parties involved in the three disaster resilience-building fields before, during and after an event.

Secondly, emergency agencies will need to resolve the degree to which they will embrace social media as part of their ECE activities. This will require review of the effectiveness and appropriateness of 'traditional' ECE activities (e.g. media, website and community meetings) in comparison with social media opportunities to build disaster resilience.

Thirdly, as promoted in this paper, social media provides 'power to the people' in emergency management through P2P interactions. A paradigm shift from being the 'combat agency' telling others to one of community engagement and knowledge sharing may be required to fully obtain the benefits of social media through shared responsibility.

Fourthly, the perception of 'community' changes through social media use from a geographic locality to communities of interest and, ideally, disaster resilience communities of learning. This may mean the re-focusing of ECE activities using social media to not only the geographic community at risk but also the broader community of interest.

Lastly, there are potential issues of trust and misinformation that will need to be managed by emergency agencies when using the more 'open' social media. Bruce Lindsay, US Congressional Research Service analyst warns that "malicious use of social media during an incident can range from mischievous pranks to acts of terrorism" (Lindsay, 2011).

In conclusion, it appears that social media could greatly assist in the building of disaster resilience, particularly based on the strategic framework promoted in this paper. As Yates and Paquette (2010) suggest, "in short, it seems that social media are inherently flexible yet have the robust knowledge

structures that are closely aligned with how knowledge is gathered, shared and employed in a disaster response". The same could be said for other aspects of emergency management, as well as for disaster-related risk reduction and community development.

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About the author

Neil Dufty is a Principal of Molino Stewart Pty Ltd. He has extensive experience in the design, implementation and review of disaster-related community education, communications and engagement policies and programs across Australia. Over the past two years he has conducted extensive research into ways to build community disaster resilience including through the use of social media.

National Awards for Local Government 2012

The Attorney-General's Department (AGD) sponsors the *Land use planning – Addressing disaster risk and enhancing resilience* award in the 2012 National Awards for Local Government.

The National Strategy for Disaster Resilience makes the case for reducing risk in the built environment. Comprehensive consideration of hazards and risk in the planning system needs sound understanding of the hazards and risks. An understanding of risk management principles and approaches to strategic planning and development controls that will adequately mitigate identified risks is also required.

This award recognises councils that work to better serve their communities by strengthening disaster resilience through innovative risk-based land use planning and is open to all councils – large, small, capital city and non-capital city.

Entries opened on 1 December 2011 and will close on 17 February 2012. For more details please visit the National Awards for Local Government on the Department of Regional Australia, Local Government, Arts and Sport website at www.regional.gov.au/local/awards

AGD also hosts a Risk-based Land Use Planning course at its Australian Emergency Management Institute. Details of the course are available at www.em.gov.au/aemi

Erratum:

In our Volume 26, issue 3, July 2011 edition we published a preliminary version of Christianson, McGee and Jardine's paper entitled Canadian wildfire communication strategies. The following link now has the correct restructured version:

http://www.em.gov.au/Publications/Australianjournalofemergencymanagement/Pastissues/Pages/AJEM-Volume-24-Issue-3-July.aspx