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DISASTER RESILIENT AUSTRALIA
GET READY

Foreword

By Mark Crosweller AFSM, Director General,
Emergency Management Australia

As part of the 2014-15 Federal Budget, the Australian Government announced the establishment of a virtual Australian Emergency Management Institute (AEMI) within the Attorney-General's Department to be run out of Canberra. This decision saw the relocation from Mount Macedon in Victoria to Canberra in the ACT, a process completed in June 2015. This issue of the *Australian Journal of Emergency Management* (AJEM) is significant in the new direction AEMI is taking and in discussing how we manage and prepare for catastrophic disasters in the future.

AEMI at the Mount Macedon site was established in 1956 and has built a national and international reputation as a centre of excellence for knowledge and skills development in emergency management. The Mount Macedon based Institute provided a range of education, training, professional development, information, research and community awareness products and services.

In relocating to Canberra, AEMI required significant reworking of the existing operating framework. A review explored the most effective model to continue delivery of the AEMI core objective to build national capability in emergency management and disaster resilience through education, collaboration and innovation. Underpinning the review was the fact that the Australian Government remains committed to developing and delivering national capability in emergency management, but in a more effective and efficient way that better meets the needs of the sector.

The review included an extensive stakeholder engagement and market analysis process to evaluate the best way to continue to provide Australia with a range of emergency management products and services, ensuring their continued improvement and suitability to build Australia's national capability and resilience to disasters. As part of the analysis, the Department explored the opportunity to deliver AEMI's products and services in partnership with the emergency management and education and training sectors. The Department undertook two tender processes seeking to enter into collaborative interface arrangements for the provision of emergency management education, training and professional development products and services.

This process is going through the final stages before a decision is made on who will work with the Department in delivering top quality emergency management capability to the nation.

The arrangements will potentially include the delivery of educational services, doctrine development through comprehensive stakeholder negotiation, networking and building national capability, school education programmes, knowledge management, volunteer support and accredited education and training.

The Department is confident that the establishment of these collaborative interfaces will prove to be a useful mechanism that will greatly increase the reach and accessibility of the Institute's products and services.

For existing students who have indicated their intention to complete their studies, AEMI continues to maintain seamless support and course delivery through the Department.

New students will access a variety of vocational and post-graduate emergency management qualifications through the new model.

Support for emergency management volunteers to develop their skills through education remains a high priority. AEMI will continue its current commitment to

volunteers and will consult with peak volunteer bodies, including the Australian Emergency Management Volunteer Forum, the Australian Fire and Emergency Service Authorities Council and the Australian Council of Social Service, to develop accessible and targeted training, education and professional development.

The Department continues to welcome feedback about the delivery of services to the community through the AEMItransition@ag.gov.au email address.

I am confident that the successful tenderers will work very closely with AEMI, and we look forward to a strong partnership with far reaching benefits across the emergency management sector.

In this issue of AJEM I have contributed a paper titled 'How a change in thinking might change the inevitability of disaster'. The paper explores the inevitability and predictability of catastrophic disaster and how it is not possible to avoid natural disaster events. The purpose of the paper is to explore how changing our perspective when looking at complex problems in uncertain environments influences our understanding, situational awareness and outcomes.

The paper discusses the necessity for us to not only get better at being prepared for, responding to, and recovering from natural disasters (which we are doing) but also to accept the inevitability of a catastrophic disaster that would stretch us beyond our own limits. I argue that we should approach the problem of catastrophic natural disaster differently by changing the way we think about them to better manage these events.

This AJEM issue also provides insight into the Sendai Framework for Disaster Reduction 2015-2030, which was adopted at the Third United Nations World Conference of Disaster Risk Reduction in Sendai, Japan in March 2015.

The Sendai Framework, which replaced the Hyogo Framework 2005-2015, marks a paradigm shift in the international context and provides innovative initiatives, including for example a shift from disaster management to disaster risk management and a strong call for strengthening the use of science and technology in policy-making.

'Understanding disaster risk' is one of the Framework's four priorities for action. The Australian Government supports this priority through AJEM as a platform to share knowledge, experience and imagination. AJEM has had and will continue to further such understanding to strengthen national and all-hazard disaster resilience.

This AJEM also looks at leadership in disasters, communication and community engagement and situational case studies. I hope you find the content informative and useful in building your own capability.

Mark Crosweller AFSM

Director General, Emergency Management Australia

Australian Government

Attorney-General's Department

Emergency Management Australia

Community awareness publications can be downloaded for free from the **Emergency Management Australia** website from early August

www.ag.gov.au/EmergencyManagement

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DISASTER RESILIENT AUSTRALIA

Post incident research – gaining knowledge after the event

By David Bruce, Communications Manager, Bushfire and Natural Hazards Cooperative Research Centre

Background and context

Research activities that follow major natural hazards are co-ordinated nationally by the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC) for emergency services organisations. This research has provided fundamental information for these organisations on what drives community behaviour during an emergency event, the policies that relate to the protection of lives and property, and the effectiveness of those policies.

Until now, bushfire has been the hazard in focus, but the scope is about to broaden to other natural hazards with a broader set of research possibilities.

In the aftermath of the 7 February 2009 Black Saturday fires in Victoria, the Bushfire Cooperative Research Centre assembled a large taskforce of researchers and fire and emergency services staff from across Australia and New Zealand. The taskforce gathered vital data from fire-affected areas related to fire behaviour, property loss, and community behaviour. This post-fire research provided information to the 2009 Victorian Bushfires Royal Commission. The Bushfire CRC used this research as a template for community surveying and research after major fire activity, and it now continues to be undertaken by the BNHCRC for emergency services organisations.

While traditionally the BNHCRC has facilitated post-event research activities following bushfires, these types of research activities are equally applicable to other natural hazards, including major storms, cyclones, floods and earthquakes. The same reasoning applies to the type of research undertaken. There has been a strong focus on community impact studies in the past, however there are a range of other areas where the CRC could provide research support following an event, including business impacts and effects on buildings and infrastructure.

Information collected in post-event studies such as those undertaken following Black Saturday and other significant fires, assists emergency services organisations to understand what drives community behaviour and the affects of certain policies and programs. This knowledge directly informs policies, programs and funding related to the protection of lives and property and enables these agencies to better monitor the effects of these policies.

Research teams at the Siding Spring Observatory in Coonabarabran, New South Wales after the summer fires of 2013.

Image: David Bruce, Bushfire and Natural Hazards CRC

Post-event research themes

The diversity of agencies and their needs for post-event research activities across all natural hazards has driven the CRC to develop a standardised approach to post-event research activities. A workshop in May 2015 with the Australasian Fire and Emergency Service Authorities Council Community Engagement Technical Group was a first key step to understanding client needs in this area.

High-level research themes identified at the May workshop include:

- drivers of community response
- impacts of community warnings and information
- economic impacts on the state
- effectiveness of interventions and mitigation measures
- the scale and nature of post event investment
- impacts on land-use planning and building regulations

- the role of emergency services organisations
- perceptions of risk and resilience
- effectiveness of partnerships
- impacts on Indigenous and rural communities.

These research themes could be adapted for all natural hazards in all jurisdictions and cover a range of issues, including and beyond community impacts.

Using the research

Every jurisdiction identified similar uses for the post-event research including:

- informing policies and altering the direction of programs
- driving evidence-based decision-making related to program design, budget allocation and training
- informing a sector-wide approach to continuous improvement in emergency management
- identifying priority areas of focus, ideas for further investigation or opportunities for trial programs.

The BNHCRC is now working on a range of suggestions that will streamline the post-incident research process and help agencies overcome challenges in study design and commissioning. These include:

- developing a pre-approved standing contract or panel type arrangement in order to respond quickly following an event
- developing a bank of pre-approved questions covering all research themes
- providing guidelines regarding what types of research projects will require ethics approval
- providing budget guidelines for cost ranges for different types of projects and different scopes
- facilitating inter-agency partnerships and sharing of resources
- producing a checklist of research requirements that can be gathered at the same time (e.g. data sets, maps)
- standardising governance frameworks.

Case study: community bushfire readiness 2009–2014

This case study illustrates the broad value of post-event research, and how it can challenge assumptions about community hazards education, and point to possible policy changes.

The case study describes the work of the BNHCRC and the Bushfire CRC researchers interviewing communities affected by destructive bushfires in Victoria, Western Australia, Tasmania and New South Wales from 2009–2014. Research was conducted at the request of fire agencies in those states and their purpose was to inform agencies about how residents understood bushfire risk, planned and prepared for a possible bushfire, and responded to a serious bushfire event.

The New South Wales Rural Fire Service worked with both CRCs after major fires in 2013, which was one of the most challenging and dangerous years for bushfires in NSW in more than a decade.

Anthony Clark, Group Manager of Corporate Communications at the New South Wales Rural Fire Service said the studies contributed to the national research agenda.

'These fires presented an opportunity to learn and refine our processes, particularly in relation to community preparedness and the delivery of information and warnings. The research has delivered benefits, influencing our approach to community engagement, as well as improving our understanding of how the public uses and responds to information and warnings, and the barriers that may prevent people responding,' he said.

The main researcher in all these studies was Dr Jim McLennan, an adjunct professor in the School of Psychology and Public Health at La Trobe University.

High-level findings from all studies include:

- A significant percentage of residents of the bushfire-affected communities had neither planned, nor prepared for, a possible bushfire.

Image: David Bruce, Bushfire and Natural Hazards CRC

Staff from across the emergency services sector move into the areas around Wandong hit by the Black Saturday fires in 2009.

Researchers inspect property damage at Marysville and Kinglake after the 2009 Black Saturday fires in Victoria.

- While many reported having 'a plan' as to what to do in the event of a bushfire, few (five per cent) had written plans.

- An appreciable percentage of residents (81 per cent) who had a bushfire plan undertook no or inadequate preparations to implement that plan—especially a plan to self-evacuate safely.

- Few people (two per cent) self-evacuated early on the basis of fire danger weather predictions before reports of a fire.

- Few (eight per cent) participated in organised community bushfire safety activities.

- About a third (27 per cent) reported reading agency material about bushfire safety.

- Less than ten per cent reported consulting material on fire agency websites before the fire.

Different motivations drove residents' choices of household bushfire planning. Residents who planned to leave indicated this was because of the perceived danger that would be posed by a bushfire, especially if the household included vulnerable members such as the elderly, the disabled or young children.

Most residents who planned to stay and defend did so in order to protect their valued property—of either financial or emotional value, or a combination of both. Staying and defending was seldom understood by residents as a bushfire survival plan, rather it was understood by most to be asset-protection involving some level of acceptable risk.

Residents who intended to wait and see what developed before making a final decision typically did this because:

- they perceived their bushfire risk to be low

- they believed that waiting would not add to their risk

- they viewed both leaving unnecessarily and having to defend against a serious fire as equally unappealing

- they intended to wait and hope for the best that the fire ultimately would not threaten their property.

Implications for agencies

The findings suggest that fire agencies have been only moderately successful in raising overall levels of bushfire preparedness in at-risk communities. Impressions reported by interviewers suggest that more residents understand the inherent dangers posed by bushfires than was the case before Black Saturday in 2009. More residents view staying and defending as a course of action that involves a degree of risk and is not a choice to be made lightly. However, the findings from six post-Black Saturday interview studies suggest that overall levels of bushfire threat readiness among residents in at-risk communities remain lower than desired by fire and emergency services agencies.

Future directions

Probably the most pressing need is for new approaches to increase the numbers of residents in at-risk communities who have planned and prepared appropriately to survive a future serious bushfire threat. Most agencies rely heavily on making detailed written information about bushfire safety available and exhorting householders to read this and act on it. Decades of research into health promotion and injury prevention demonstrate that education-based approaches alone result in limited improvements at best. Success stories such as lowering the road toll and reducing smoking rates involved costly mixes of innovative approaches to motivation and education, engineering solutions, legislation, sanctions, incentives and enforcement. There is no reason to believe that improving community bushfire safety will prove any easier. The BNHCRC research program is currently investigating new approaches to community warnings before, during and after hazard events.

Sendai Framework for Disaster Risk Reduction 2015–2030

Following a marathon final round of negotiations, the Sendai Framework for Disaster Risk Reduction (the Framework) was adopted on 18 March 2015 at the United Nations' Third World Conference on Disaster Risk Reduction (3WCDRR).

The Framework is the new global blue print to build resilience to disasters. Its expected outcome over the next 15 years is to realise 'substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.'

Building on the progress made under its predecessor, the *Hyogo Framework for Action 2005-2015*, the new Framework places a strong emphasis on managing disaster risk, as opposed to simply managing disasters. Like Australia's *National Strategy for Disaster Resilience*, it acknowledges the importance of all stakeholders (governments, civil society, and the private sector) working together in the design and implementation of disaster risk reduction policies and plans. It has a strong emphasis on the value of engaging with those more marginalised in the community, such as women, children, the poor, migrants, indigenous communities and those with disabilities. Further, the Framework recognises that managing disaster risk is an important component of sustainable development, and acknowledges that close linkages need to be made between the disaster resilience, sustainable development and climate change agendas.

To achieve its outcome, the Framework outlines four key priorities for action that focus on a better understanding of risk, strengthened disaster risk governance, greater investment, and greater disaster preparedness based on the principle of 'building back better'. The Framework also articulates seven global targets (see Global targets of the Sendai Framework). Member countries will now work together to develop indicators for each of the seven targets which, once developed, will allow countries to measure whether the outcome of the Framework is being realised.

Global targets of the Sendai Framework:

1. Substantially reduce global disaster mortality by 2030, aiming to lower average per 100 000 global mortality between 2020–2030 compared to 2005–2015.

2. Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100 000 between 2020–2030 compared to 2005–2015.

3. Reduce direct disaster economic loss in relation to global gross domestic product by 2030.

4. Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through the development of their resilience by 2030.

5. Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.

6. Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework by 2030.

7. Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

Attendance in Sendai

6 500 participants
25 heads of state
42 inter-governmental organisations
236 non-government organisations
300+ private sector representatives
280 local governments

The Third World Conference on Disaster Risk Reduction

The 3WCDRR saw the highest ever levels of participation at an international meeting on disaster risk reduction with thousands descending on Sendai to share experiences and build partnerships. In addition to intergovernmental elements, over 50 000 people attended the public forum. The public forum was the perfect platform for delegations to share their countries' initiatives while learning about best practice in other regions. Highlighting the work under the *National Strategy for Disaster Resilience*, adopted by the Council of Australian Governments (COAG) in 2011, Australian delegates at the Australia exhibition booth were very well received. Australia's *National Strategy for Disaster Resilience* mirrors elements of the new Sendai Framework, encouraging a whole-of-nation resilience-based approach to disaster management.

The Minister for Justice, the Hon Michael Keenan MP, led the official Australian delegation. Accompanying the Minister were officials from various Commonwealth agencies, as well as David Place from the South Australian Fire and Emergency Services Commission and Damien Killalea from the Tasmania Fire Service. There were also a number of prominent Australian academics in attendance, including John Handmer from RMIT, Michael Eburn from the ANU, and Kevin Ronan from CQU. Throughout the conference Minister Keenan highlighted Australia's experiences in disaster risk reduction, particularly through delivery of Australia's official country statement and participation in the Ministerial Roundtable 'Reconstructing After Disasters: Building Back Better'. At the Ministerial Roundtable the Minister shared Australia's own experiences in 'building back better' using the successful land swap initiative implemented in the town of Grantham, Queensland as an example of success in this area.

Minister Keenan also visited Minami Sanriku, a town in the Tohoku region devastated by the earthquake and tsunami of March 2011. Minami Sanriku was the focus of Australian search and recovery operations. Minister Keenan's visit further solidified the strong relationship between Australia and the Tohoku region, where Australia continues to contribute to the region's recovery. Australian sponsorship of 'Koala house', a community-based library service, is just one example of Australia's commitment to the regrowth of communities.

The importance of the Framework and its call for greater collaboration across country borders and sectors was highlighted when the devastating news broke of *Cyclone Pam's* landfall on Vanuatu. When delivering his country statement on the very first day of the conference, Vanuatu's President Baldwin Lonsdale reminded member states that no country is immune to disaster risk and there is a need to work together. This was a sombre reminder of the importance of the conference and in building disaster risk reduction worldwide.

The Hon Michael Keenan MP, Australian Minister for Justice, meeting HE Mr Fumio Kishida, Japanese Minister for Foreign Affairs.

Minister Keenan delivering Australia's country statement on 15 March 2015.

The need for greater engagement between governments and the private sector was another key theme at the conference. The Australian Business Roundtable for Disaster Resilience and Safer Communities received a certificate of distinction in the prestigious 2015 United Nations Sasakawa Award for Risk Reduction presented during the conference. Established in 1986, the award recognises innovative efforts to reduce the impact of disaster and build resilience. This was a significant achievement that highlighted the successes Australia is having under the shared responsibility model of the *National Strategy for Disaster Resilience*.

The future

With the global blue print now agreed, regional and national bodies will develop instruments towards the achievement of targets to ensure the outcomes of the Sendai Framework are realised. As stated by the Secretary-General of the United Nations Ban Ki-moon, the Sendai Framework is 'the first step of our journey to a new future'. It is now up to everybody to show strong commitment and leadership to this cause.

Information on the 3WCDRR, including Australia's country statement and the Framework are available at: www.wcdrr.org.

EMA's podcast includes the 3WCDRR and the Framework at: www.em.gov.au.

OPINION
Preventing 'lessons lost': is evidence-based dynamic doctrine the answer?

By Steve Glassey, MEmergMgt FEPS CEM®

Even before an After Action Report is compiled, we know that, if things did not go well, the same issues of leadership, role clarity, communications, and training are likely to rear their repetitive heads. In New Zealand, numerous incidents including the Napier Earthquake (1931), Ballantyne Fire (1947), Wahine Ferry Sinking (1968), Pike River Mine Disaster (2010) and the CTV building quake collapse (2011) all share similar lessons learned—but are they really learned? Each inquiry, though different in circumstance and environment, makes recommendations—recommendations that have been previously identified, but never institutionalised. We promise the affected families and the public that these deficiencies will never be repeated—but they are. Why do we make the same mistakes, over and over throughout time? How often do we read historical After Action Reports? The lack of institutional and social memory could certainly be a factor, but how do we ensure that lessons identified are actually turned into lessons learned?

In a recent request for all After Action Reports for declared civil defence emergencies in New Zealand between 1960 and 2011 (n=170), only 56 (33 per cent) were provided, 80 (47 per cent) were unable to be located, 14 (eight per cent) were sourced from National Archive or private collections as the declaring authority did not have any records, seven (four per cent) were merged with other requests due to declaration overlap, and eight (five per cent) could only provide peripheral information about the emergency. Some requests took several weeks and even months to locate and

some were withheld (rightly or wrongly) under *Local Government Official Information and Meetings Act 1987* exclusions. What this highlights is how can we learn lessons if we don't even know what the lessons were if reports are non-existent? Even the Ministry of Civil Defence and Emergency Management's 'database' of declared emergencies omits events and, despite the requirement to gazette each declaration, the Gazette Office was unable to provide a summary of declared events. What a mess!

Like a stone being dropped into a pond, the ripples fade the farther away from the point of impact; just like lessons learned. The closer (geographically, politically or emotionally) we are to the lesson identified, the more likely we are to know of it. We simply do not learn from our lessons and we need a mechanism to identify the issues in real-time during an emergency, not realising in hindsight that yet again, the lesson identified has been repeated. How can we move from a culture of identifying lessons, to actually learning them dynamically and in a sustainable fashion?

In New Zealand, the term 'doctrine' has started to emerge. It was formally introduced in the revised *Coordinated Incident Management System* (CIMS) manual (2014 edition) and defined as:

> *'the body of principles and practices that guide an agency's actions in support of their objectives. It is authoritative, but requires judgement in application'* (Department of Prime Minister and Cabinet 2014).

The section explaining 'doctrine' provides a flawed and over simplified model that assumes that doctrine informs training, which is applied in operations, which is updated from operational learning. There is no evidence to suggest this model is valid. In fact a workshop of experienced emergency managers (including military and civilian personnel) concluded that emergency management 'doctrine' was vague at best. If such a model is in effect, why do we repeat over and over the same mistakes operationally?

There are different types of doctrine including religious, political and military, the common characteristic being that they are written and codified—something that emergency management 'doctrine' is not. Who controls doctrine? Is it formal or informal? Do we have a codified body of knowledge for emergency
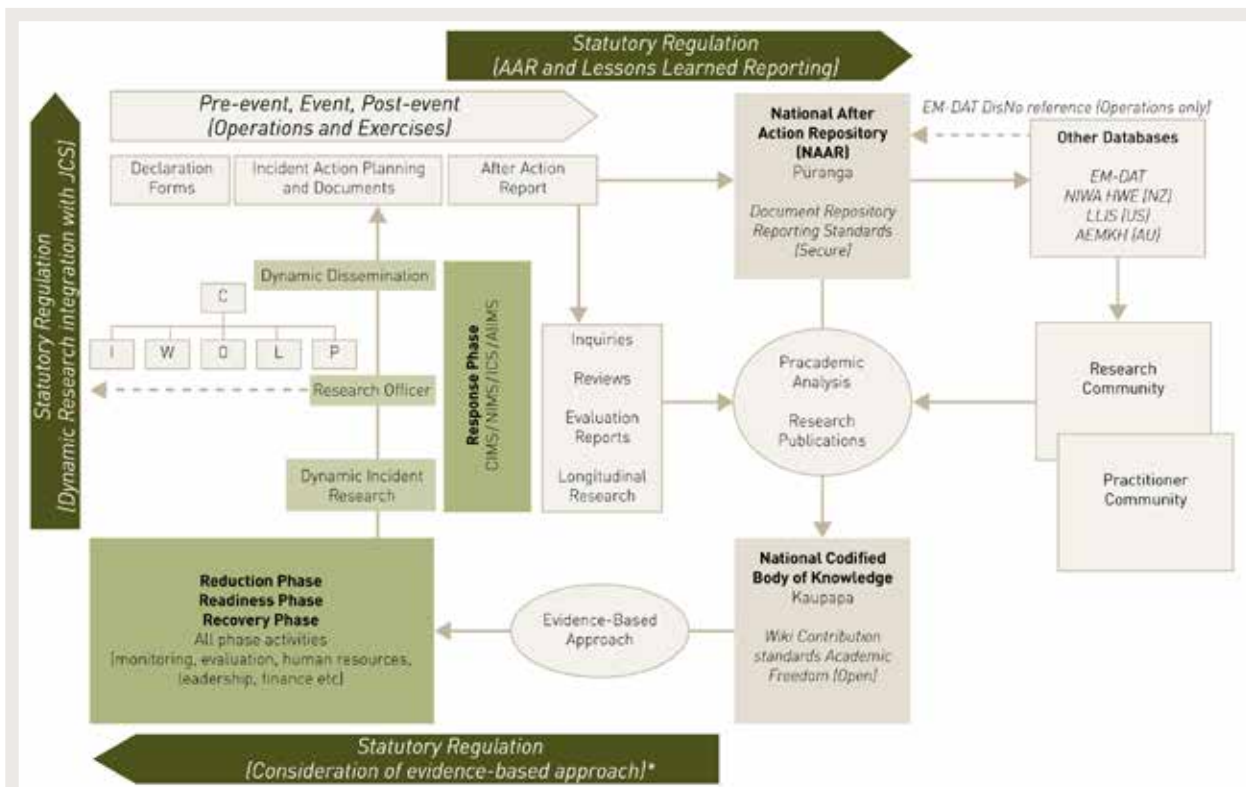
* Statutory consideration of evidence-based approach requires authorities to consider an evidence-based approach. Where a final course of action is not consistent with an evidence-based approach, a statement of justification (e.g. lack of resources) must be disclosed.
C = Controller, W = Welfare, O = Operations, L = Logistics, P = Planning, I = Intelligence

Figure 1: Evidence Based Dynamic Doctrine by Glassey 2014.

management? Is it evidence-based, tradition or historically based? The continual use of 'doctrine' in emergency management is meaningless unless we define it—which, to date, we have not done. Evidence-based doctrine refers to a codified body of knowledge based on evidence—not political or preferential views. The Prime Minister's Chief Science Advisor, Professor Sir Peter Gluckman has criticised New Zealand government officials for providing advice based on personal views, without any evidence (TV3 News 2013). Evidence-based doctrine ensures the codified body of knowledge is based on empirical research, not personal beliefs, opinions or agendas. However, doctrines are typically not updated in real-time, which is a flaw in their existence, particularly in an emergency management context. The development of an Evidence Based Dynamic Doctrine (Figure 1), uses active research during an emergency to inform, in real time, better decision making and reduce the size of the lessons identified loop.

The Evidence Based Dynamic Doctrine (EBDD) has five key elements:

• Dynamic Incident Research within Incident Management Team

• National (Centralised) Repository for After Action Reporting *(Puranga)[secure access]*

• Pracademic Analysis

• Codified Body of Knowledge *(Kaupapa) [open access]*

• Evidence-based approach to comprehensive emergency management.

Centralised repository for after action reporting

Following the response (and later recovery) a standardised after action reporting system ensures all incidents are captured in a secure document depository, where other officials can access reports. Incident data can also be shared with international databases such as EM-DAT operated by the Centre of Research for the Epidemiology of Disasters (CRED). However, after Action Reports are subject to bias and are generally not independent. In New Zealand, there is no requirement for authorities who declare a state of emergency to compile an After Action Report, and even if they do, there is no document standard, nor obligation to share it with the rest of the emergency management sector. A regulatory instrument should be created to ensure that after action reporting is conducted in a standardised fashion and ensure these updates are centrally stored and shared securely within the sector.

Pracademic analysis

The *Pracademic* analysis is jargon for the analysis of research and other sources of information that is conducted jointly by practitioners and academics. Often there is a significant divide between these two

An incident management team tests Standard Operation Procedures during Exercise Phoenix, June 2015 in Waitaki, New Zealand.

groups and the lack of any requirement for emergency managers to have higher education qualifications compounds this division. Using a panel of practitioners and academics, After Action Reports along with other sources of information (such as research projects, inquiries, evaluations) are codified into an online knowledge repository (such as a wiki), which is regularly reviewed. This approach encourages practitioners and academics to work closely together.

Codified body of knowledge

This codified body of knowledge (CBOK) is open and available to the public and end users. It is hosted in an academic environment to afford it academic freedom and to ensure it conforms to set contribution standards. It is this CBOK that is used in applying an evidence-based approach to emergency management, including in emergency management teaching curricula. Over time, the CBOK will grow in volume making it an up-to-date and authoritative source of evidence-based practices.

Evidence-based approach

A regulatory instrument requires mandated organisations to consider an evidence-based approach, as ultimately, in a democratic environment, decisions are often made based on politics, not evidence. The regulatory instrument requires decision makers to make public disclosure when they are not taking an evidence-based approach and outline their justification

to do so. This also protects policy makers as often they are constrained by budgets and this disclosure puts the decision-making back on communities to determine what they want from their community leaders. For example, if citizens are told there is no budget for an early warning system but their municipality is upgrading a swimming pool, citizens have a choice to advocate for the warning system or accept they will have a reduced level of warning. It is about encouraging communities to make informed decisions about the hazards they live with and choosing how best they are managed.

It also encourages policy makers to engage with communities through deliberative democracy. The evidence-based approach applies to all phases and cross-cutting themes in comprehensive emergency management. It means that from public education campaigns to human resource recruitment and selection, an evidence-based approach is taken. Pilot projects that may not be evidence-based can still continue to ensure innovative and creative solutions are trialled; however they would be done so in a structured and validated fashion, in which results would be formally evaluated through pracademic analysis to determine whether it is added to the codified body of knowledge.

Dynamic incident research

The system closes the loop, based on all the previous After Action Reports and research, starting at the time of a response. A research officer is embedded in the incident management team (generally in

the Planning cell) who identifies critical evidence-based considerations for the Incident Management Team. The research officer primarily sources such considerations from the codified body of knowledge or uses their independent research skills to investigate novel problems. Their goal is to identify the issues while the incident is unfolding, rather than to identify problems after the fact in the post mortem phase. This creates real-time risk management within the incident management system, rather than researchers only being engaged after the response to review in hindsight areas for improvement, as has been the case traditionally.

Every time the journey is made around the evidence-based dynamic doctrine circuit, the lessons learned circle size reduces as previous mistakes and lessons should not be repeated. Additionally, the focus of the dynamic research should evolve from being less reactive, to being more proactive, with a reduction in the same issues being re-experienced during the response phase. As a result the research officer has more time to look at forecasted issues to resolve.

Without embedding dynamic research into the Incident Management Team, this model would only be an evidence-based doctrine (which is better than just a doctrine that is not necessarily evidence-based). The Dynamic Research process carried out by the research officer requires the model to be an Evidence Based Dynamic Doctrine, it provides real-time correction and support to incident planning to avoid the same mistakes from occurring time after time. It requires a special kind of researcher who has credibility and a personality compatible with front line responders. This requires specialised training for researchers, careful selection and plenty of exercising to create solid pre-event relationships so that research officers are seen as valuable contributors to the Incident Management Team, not as a hindrance with bad fashion sense and over philosophising in verbose academic ramblings.

The Evidence Based Dynamic Doctrine model creates an holistic solution that joins up fragmented important elements. We do have After Action Report repositories. We do have researchers talking to practitioners. We do try to have scientific advice in response, and we do endeavour to follow best practice. But we have been unable to draw the connections across these elements in a meaningful way.

Lessons identified, lost, buried and learned

In reality, we don't produce lessons learned reports. They are more likely to be lessons identified reports. Although there may be recommendations, they are not always practical to implement due to financial, social, political, environmental, cultural or other considerations. Lessons learned is a misnomer.

We generally have the following types of lesson-related reports:

- Lessons Identified
- Lessons Lost
- Lessons Buried
- Lessons Learned

Lessons identified reports are the most common, though they generally lack any consistent format or content (unless part of a system like the Lessons Learned Information Sharing or LLIS operated by the US Department of Homeland Security). They are generally produced by the agency and highlight areas of improvement, though there should be a greater emphasis to include what went well too.

Lessons lost reports are those that have been compiled, but unable to be found or retrieved. The example of 47 per cent of New Zealand's declared civil defence emergency reports since 1960 being inaccessible highlights the need for a centralised repository.

Lessons buried reports are not common, but they are the reports that contain criticism that is politically unpalatable and the agency goes to lengths to prevent the report from being disclosed. This however does create the need for discussion around what should be included in reports, the frankness of opinions and criticisms, and the tension between openness and public accountability through freedom of information instruments.

Lessons learned reports are rare. Though many agencies tout their After Action Reports as lessons learned reports, they are generally just lessons identified. Lessons learned reports generally take some years to truly compile as they not only show the lessons identified, but the changes recommended, implemented and, most importantly, evaluated.

In summary, lessons learned is a misnomer. We don't really learn them, we state them. Over time social and institutional memory fades them into irrelevance. We have failed to learn them in a sustainable manner because we do not have a system in place to store, analyse, disseminate and dynamically apply them. The development of the Evidence Based Dynamic Doctrine aims to develop a philosophy around real-time correction and support to incident action planning during response, while providing an evidence-based approach across the phases of comprehensive emergency management.

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Leadership in crisis: developing beyond command and control

Dr Christine Owen, Cameron Scott, Richard Adams and David Parsons document a leadership professional development program and summarise some notable challenges for future delivery. ℝ

ABSTRACT

This paper discusses new demands facing emergency management leaders and reflects on one of the professional development initiatives for leaders in emergency management conducted through the Australian Institute of Emergency Management (AEMI). Since 2010 approximately 200 people have participated in the professional development program 'Beyond Command and Control: Leadership in Crisis'. This paper reflects on the key intentions of the program and discusses the insights gained and the learning challenges identified for future leadership programs that may be offered in the broader emergency management sector.

Introduction

Emergency management leaders confront demands far more complex than those historically faced by their predecessors (Murphy & Dunn 2012). Disasters are anticipated to become larger, more complex, occur simultaneously and in regions that have either not experienced the natural hazard previously or at the same intensity or frequency (IPCC 2012, Yates & Bergin 2009).

There are other changes afoot. Tighter interdependencies between social, technical and infrastructure systems mean that the need for co-ordination in emergency events has moved beyond traditional emergency services organisations to actively include the public and private sectors and non-government organisations as well as others. In addition, managing within a chaotic emergency environment can reinforce a traditionally reactive and commanding *modus operandi* of uniform culture.

Traditionally emergency services organisations are structured hierarchically with clear command-and-control arrangements. Dominant and collectively-held beliefs of emergency services organisations often establish social identities with clear boundaries and stereotyping (Owen 2013, Kimmel 2008, Lois 2001). However, in striving to collaborate with non-

emergency stakeholders there is a need to build network relationships and alliances and horizontal co-ordination mechanisms among peers rather than vertical control mechanisms among commanders and subordinates (Bharosa, Janssen & Tan 2011, Ostrom 2010). The implication for leadership development is that there is a need to overcome the tendency for reacting within narrow frames of problem solving. These demands require changes in cultural identity. This sets up new challenges for the development of leadership capability (Lagadec 2009).

Leaders need to create the background conditions where team members and other personnel can share, refute and calibrate information to build 'collective meaning structures' (Kruke & Olsen 2012), particularly when there are signals that things are problematic. This is critically important if individuals and teams are to build capacity to collectively recover.

There is a need to train at 'the edge of chaos' (Renaud 2012) and to build capability in what Marcus, Dorn and Henderson (2005, p. 129) call 'meta-leadership'. In discussing terrorism preparedness in the US they asked the question: '*If leadership, as traditionally understood, is working to build the capacity within organizations, then what different brand of leadership is necessary to get beyond that silo thinking to achieve the cross-agency coordination of effort required?*' These challenges extend beyond organisations. More attention in across-agency professional development that facilitates relationships, as well as the skills required, is needed.

Unusual business or business as usual?

In a workshop held in 2009 titled 'Unusual Business or Business as Usual?' emergency management stakeholders from a range of jurisdictions came together to contemplate the changing emergency management landscape and its implications for both leadership and professional development. The continuing trends in emergency events since 2009 have borne out the question posed at the workshop: 'Were the kinds of emergency events that had happened up until then unusual – or a sign of a major shift?'

One of the conclusions reached at the workshop at the Institute was that, in terms of building a leadership professional development agenda, it was important *not to confuse command and control with* leadership - as these represented fundamentally different things.

Leadership beyond command and control

In 2010 a professional development program called 'Beyond Command and Control: Leadership in Crisis' was launched at AEMI. Inaugurating this program, the Institute presumed leadership programs must provide opportunities for personnel to think deeply about their own practice. The curriculum intentions were to *'challenge participants to explore their own leadership styles and rethink traditional models of leadership in the context of a rapidly changing environment'.* The course syllabus noted that *'while the traditional command and control models provide a framework for managing incidents, a legislated command role does not provide the intangible elements of leadership or necessarily facilitate an adaptable and flexible approach to a non-routine situation'.*

As future leaders, participants need to look beyond incident management structures as the only solution to every problem and to build capability in communication and managing relationships, including political ones.

Since 2010 a total of 13 courses have been conducted. It is timely to reflect on the key intentions of the program and discuss the challenges that have arisen so that future leadership professional development programs may build on these insights.

Course rationale

The program attracts senior and emerging leaders in emergency management who have or will have roles that require them to work beyond the operational context and who need an understanding of strategic crisis leadership. The intention within every course offered is to bring participants together to allow cross-jurisdictional and agency collaboration and networking. The program is conducted over two and a half days.

Participants are advised that they would not find 'how to' scripts to help them become better leaders. Rather they need to reflect on:

- communication patterns in the face of ambiguous and uncertain conditions

- cognitive biases and other error traps that can impede decision-making when under stress and to understand the neurophysiological mechanisms that lead to bias

- values based on personal and institutional culture and how these enable and constrain communication

- acting ethically in the face of adversity

- what constitutes the background conditions needed so that others can work effectively.

Underlying theoretical foundations are drawn from neurophysiology and decision-making. These include human factors and cognitive biases in decision-making as well as communication and cultural aspects of crew resource management developed in other related safety-critical domains (Flin, O'Connor & Crichton 2008). It is important for participants to understand the inter-relationships between human dynamics and organisational performance as well as to highlight the responsibility of leaders to teach, enable, model and to inspire fluent, amicable and effective relationships.

The program draws attention to power gradients in organisations (Flin, et al 2008) because of their pervasiveness in quasi-military organisational structures. These can be excessively prominent—and they can be dangerous. Power differences intensify the interpersonal risk faced by people who want to speak up with ideas, questions, or concerns. Leader actions thus may affect whether or not people are willing to speak (Edmondson 2005). The interpersonally safe route is to remain silent; but this is perilous. Not speaking up can protect individuals from personal confrontation. An inhibited, uncommunicative culture can harm the team (or the organisation as a whole) and magnify operational risk.

When high uncertainty avoidance is combined with high power distance, the upshot may be a culture of inflexible, unresponsive behaviours. These may be dependent on automated systems and an unwillingness to take personal responsibility or to make personally-responsible judgments. Leaders must guard against this sort of suppressive stagnation. They must be prepared to make the 'hard, right' call over the easy option. The idea that leadership should be less about domination (manifested in hierarchy and authority) and more about collaboration and building effective working relationships in a climate of open communication and trust owes much to the ideas of crew resource management, where strict seniority systems can overshadow and overpower the importance of responsible individual judgments and partnership.

The program includes a simulation designed to encourage participants to focus on decision-making processes and not the actual decisions made *per se*. Research into simulation (Rouse & Boff 2005) suggested that a fantasy scenario would give the best opportunity for this type of outcome. The two-hour simulation exercise includes a number of critical decision points that have to be agreed by the group before progression to the next stage. The focus in the simulation is on allowing participants to reflect later on their decision-making processes, including the assumptions that they make and the communicative tensions that these create and how they are resolved (or not).

Having completed the program 13 times the authors (who have all been involved in the majority of course deliveries) reflect on the insights gained from delivering a professional development program such as this, which includes some of the outstanding learning challenges participants have faced. These challenges are outlined and discussed so that future facilitators of leadership programs may capitalise on the insights.

Learning challenges

The feedback provided from participant course evaluations suggests that in many respects the program met its intended goals. Initial changes in the course program included moving away from personality trait inventories as these seemed to be used by participants to justify existing behaviour and were invoked to reinforce existing stereotypes. Changes include increasing the extensiveness of the exercise debriefing. A number of learning challenges were also observed by course facilitators. These include challenges in assisting some participants to think critically and to engage in deep reflection. There is also a challenge in assisting participants to overcome being distracted by the obvious rather than attending to less obvious but critical information. Similarly, participants get caught up in the moment of action and find it difficult to step back and think rather than to keep acting and reacting. Finally there are challenges to be overcome in assisting participants to speak up effectively.

Capacity for reflection

Not all participants walked away from the program happy and satisfied with what they had learned.

The following comment from one participant *'If you wanted us to think strategically, you should have told us'* suggests a need for two things. First, that leadership development programs build on the learning that has previously been offered. It is also not realistic to expect that change can be brought about simply through enrolling in a short external (to an agency or jurisdiction) professional development program. In need of attention are internal organisational processes that include examining the cultures and structures in emergency services organisations. It is important that all education and training opportunities (not just leadership ones) build capacity in critical reflection and in critical thinking. There may be insights from other international programs addressing these needs. Critical thinking has been described as 'active, persistent and careful consideration of a belief or supposed form of knowledge in light of the grounds that support it and the further conclusions for which it tends (Kiltz 2009, p. 9). Second, it suggests that there is a need to coach some participants in the use of these skills with feedback. Cherry (2014) discussed the need for frontline leadership programs to coach participants when they are under pressure and facing complex and uncertain conditions to be able to 'describe what they are seeing, not what they think they are seeing, to "look again" and check their first impressions and to use plain, concrete language to describe what they have not seen before' Cherry (2014, p. 33).

Captured by the tangible

The simulation exercise showed there was a consistent tendency for participants to become overly focussed on the tangible (e.g. physical resources) at the expense of information or intelligence, which is subsequently overlooked or not followed through. This is interesting given that a common belief in emergency management is that people say they 'need more information' in order to make good decisions. Coaching is needed to assist people to shift cognitive gears to focus on collective sense-making and to maximise the information that is at their fingertips rather than to become distracted by 'the tangible'.

It is interesting to note that of the 26 groups that have participated in the simulation exercise (two groups for each time the course was conducted), never once has anyone suggested that the group organise its labour according to an incident management system such as the Australian Inter-Services Incident Management System (AIIMS) or indeed suggested any other strategy to formalise decision-making. Is this an indicator that commonly used incident management structures are not sufficient for addressing novel and managing the unknown in crises?

Overcoming dysfunctional momentum

When emergency responders are engaged in a socio-cultural context where social pressure is high to 'get the job done' there is a tendency to get caught up in the moment and want to act. The desire to be doing something influenced the communication patterns within the groups, such that there was a tendency towards optimistic bias and to selectively filtering information to suit a proposed course of action. It was interesting to reflect how easily emergency management groups get caught up in this momentum. This is the same momentum that has been implicated in tragedy. In 2013 in the US, 19 firefighters died attempting to control a wildfire. While the Serious Accident Investigation Report acknowledged that noone will know the decision-making processes of the team that day, the investigators did conclude that 'a culture of engagement and a bias for action is part of wildland fire-fighter identity' (Arizona State Forestry Division 2013, p. 47). While this engagement often leads to success, in this case it may have contributed to tragedy.

In Australia, this tendency to want to act at the expense of thinking things through and assessing what can be called 'weak signals' warning of danger has been a 'can do' cultural norm. The urgency to act can lead to what Barton and Sutcliffe (2009, p. 1331) term 'dysfunctional momentum'. They suggest that momentum in action, in and of itself, merely implies a lack of interruption in the tasks at hand. However, when individuals or teams continue to engage in a course of *failing* action, (i.e. action leading to undesired or incomplete ends), this becomes dysfunctional. One of the keys to overcoming dysfunctional momentum is speaking up. This is because speaking up acts as a reminder to stop and think about the bigger picture and to test assumptions to recalibrate planning and action. The proposed plan and the current action may be appropriate to the demands of the event. However acting with 'dysfunctional momentum' represents considerable risk.

Two critical social processes are important in enabling dysfunctional momentum to be overcome. The first is giving voice to concerns and the second is the way in which leaders actively seek alternative perspectives from followers. These communication practices appear to

stimulate interruptions and to reorient the actors involved. However these skills also need practise and feedback.

Speaking up effectively

There is more work to be done in assisting participants to speak up about a concern clearly and effectively. Part of the program uses an exercise designed to assist participants to recognise an awkward moment and to apply a graded warning protocol as a means of managing the authority or power gradients frequently found within uniformed cultures. Many of the examples invoked by participants involved a subordinate wanting to bring something to the attention of a higher ranking officer. Only in half the cases was the communication delivered effectively to draw attention to the issue at hand e.g. '*this is unsafe. I'm not going to take my crews in there. We need to find another way*' as opposed to a less effective '*I'm not going to do it. Find somebody else*'. More practise is needed to address these limitations and to assist all team members to take responsibility for the 'hard right' thing to say and do.

Insight does not guarantee change in practice

If, in the words of Lao Tzu, '*the journey of a thousand miles begins with a single step*', then it is also imperative for change to occur that allows steps to continue. This program suffered from the problem facing many professional development initiatives—that people are taken out of their social *milieu* and given opportunities for insights, then are left to it with no ongoing support. There is an urgent need to establish supportive (physical or virtual) communities-of-practice that allows people to try out their new skills and continue to develop changes in their practice. This is particularly so in facilitating ethical practices that might be at odds with the *status quo* of cultural norms. This is hugely significant since, as things stand, leaders are held to account. In fact, they are often 'hung out to dry,' pilloried in the press or the boards of inquiry. But beyond the occasional intervention of a professional course, there is nothing in the way of formalised, constructive support.

In the simulation, confronted with the need for an agreed decision, participants frequently misinterpreted information provided, in order that they might justify a particular course of action. Cynically, this can be called decision-based evidence making. But behind the satire, is truth. Decisions, made under time pressure and under the surveillance of a team, are often known to be misguided. But equally as often these are decisions capacitated by team members who do not have the language to express concern. In fact, it was observed that rather than express concern, people will disengage; sometimes to the point of physically stepping out of the group's circle. Only rarely have leaders allowed their teams to challenge or contest ethically-significant decisions. Rarely do leaders act deliberately to muzzle their team members. They are often the victims of unconscious habit due to decades of acculturated practice in command and control. Properly responsive, enabling and responsible leadership lies beyond.

Conclusion

Reflecting on a significant professional development program that supports findings by Murphy and Riggio (2003) and Salas and colleagues (2012), this paper acknowledges effective leadership development needs sustained effort in coaching and in supporting leaders to develop their own confidence in seeking alternative perspectives and divergent views. In the current context these programs become even more important. In reviewing a range of post-event inquiries Murphy and Dunn (2012) concluded that in many countries and in many significant events there has been a pattern of leadership failure:

> '*The failure is seldom one of character, but inevitably a lack of preparation and understanding. Leaders, and their teams, are unable to effectively apply their knowledge and skills to a situation that is either so novel, or of a scale that is beyond their experience and conception.*' (Murphy & Dunn 2012, p. 2)

Murphy and Dunn (2012, p. 7) go on to suggest that classic leadership training, though effective for routine events, is less successful in the case of novel or what they call 'out of scale' disasters. The changing landscape suggests that these out-of-scale disasters are becoming more frequent. Illustrating this point, the Yarnell accident inquiry report (Arizona State Forestry Division 2013) noted 19 firefighters perished wretchedly, perhaps because they were acclimatised to high temperatures and low humidity. The report notes that many in the emergency services business are becoming desensitised to 'weak signals' because of their frequency.

> '*People in the desert southwest may become desensitized to high temperatures and low relative humidity during certain times of year … In other parts of the country, these kinds of predictions are rare; when they do occur, they constitute "strong signals." Like car alarms in an urban neighbourhood, repetition of strong signals resets the cognitive baseline for what is "normal." There is also danger that a fire-fighter may become desensitized to extreme fire behaviour, based on an old mental model that extreme fire behaviour is rare. One SME said, "The unusual is now usual – the scale of fires today is extreme. That's what's normal now." Another said, "This fire went from wildland to WUI (Wildland-Urban Interface) within a burn period. This is part of the new reality. The new normal is extreme fire behaviour."*' (Arizona State Forestry Division 2013)

Desensitised to the strong signals of deteriorating conditions, the firefighters ignore these signals at their peril.

Submersed in a rich inherited culture, emergency services personnel risk a similar fatal insensitivity. Over time leadership philosophies and behaviours come to be non-constructive. But they come as well to be familiar, comfortable and not easily changed.

It is important to acknowledge that leadership programs are only part of a strategy for developmental

improvement. Leadership practices within organisations also need to tackle challenges like power gradients and to address entrenched practice and cultural issues. Acknowledging that institutional relevance depends on institutional renewal, this paper suggests the need to think about leadership, beyond the proverbial language and practice of command and control. Power gradients, part of the furniture in most places, must be interrogated so responsible individuals can appreciate and play their part in strict seniority systems. Rather than dominance, ideas of collaboration should inform the curriculum.

Ideas like this provide particular pedagogical challenges for future providers of emergency management leadership programs. These ideas, for example, are unlikely to be addressed in a program of distance course work. The leadership discourse depends on discussion. The practice of leadership demands practice. There needs to be mindfulness of the powerful unquantifiable benefit that comes from face-to-face exchange.

This paper has provided some insights into this program. It has identified a number of challenges that future facilitators may find useful. Documenting these observations contributes to the foundation knowledge needed for this important and worthy cause.

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Community wellbeing: applications for a disaster context

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ABSTRACT

The concept of resilience has become a guiding principle for preparedness, management and recovery. This paper argues that community wellbeing provides a broader means to understand disaster affects and outcomes and recognises that the cultural and social history and future of the community is more than just its experiences of disasters. The concepts that underpin community wellbeing approaches are explored, as are potential approaches to assessment that hold significant value in the reframing of communities beyond their experiences, offering the potential for both empowerment and strengths-based reflection.

Background

Following multiple, large scale disasters in recent years, the international research focus has shifted to theoretical and applied aspects of how resilience relates to community reaction to disasters and the effectiveness of the subsequent response (Council of Australian Governments 2011). In Australia, the Council of Australian Governments noted that the common characteristics of resilient communities, individuals and organisations are functioning well while under stress, successful adaptation, self-reliance, and social capacity.

The *Australian National Principles for Disaster Recovery* (Community and Disability Ministerial Advisory Council 2009) highlight the need to understand the community context. This is also reflected in disaster recovery guidelines and texts published in the USA (Alesch, Arendt & Holly 2009, Natural Hazards Centre 2005). Consideration of context in the post-event environment also requires understanding community processes and how best they can be measured. The relevance of community wellbeing measures to understanding context, however, has been largely under-recognised. This paper argues that wellbeing is a highly relevant but under-used concept in assessments and understanding of community responses to disasters.

Community wellbeing

The term 'community' is widely used but because it is difficult to define and has been extensively debated (Blackshaw 2010, Delanty 2003), it is valuable within each study to define the characteristics of the community involved. The status of communities has been measured in terms of resilience, wellbeing, wellness, sustainability, level of function, and quality of life (Auh & Cook 2009, Davis, Cook & Cohen 2005, Hancock, Labonte & Edwards 1999, Maybery *et al.* 2009, Norris & Stevens 2007, Ryan-Nicholls & Racher 2004). Although terms such as 'wellbeing', 'quality' and 'level of function' have been used interchangeably, they have different meanings and are sometimes philosophically polarised. An individual's satisfaction with their community does not necessarily reflect the health of the community in terms of factors such as sustainability or the equitable provision of goods and services to all. Wiseman and colleagues use the term 'wellbeing' to refer to community level experience (Wiseman *et al.* 2006). They ascribe a holistic quality to wellbeing, encompassing:

> '...the interrelationships between economic, social and material wellbeing; the downsides of economic growth, as well as the benefits; the limits of natural assets; the value of heritage and environment; the need to keep natural systems in balance; the importance of non-material aspects of wellbeing such as cultural, spiritual and psychological considerations; the benefits of strong communities and of social inclusion; and participation and the need to keep sight of benchmark values such as democracy, human rights and active citizenship.' (Wiseman *et al.* 2006, p. 19)

This perspective is pertinent for disasters as the effect is often community-wide involving dislocation, economic disruption, and challenges to the social fabric and psychological wellbeing of the group. Wiseman and fellow authors also attribute a dynamic quality to wellbeing with its description as 'a state of healthy development' linked to ongoing progress (Wiseman *et al.* 2006).

The relationships between community wellbeing and resilience

In contrast to definitions of wellbeing, definitions of resilience have focused on the ability to adapt or respond to risk (Davis, Cook & Cohen 2005, Norris & Stevens 2007, Price-Robertson & Knight 2012). Individual, community or society's resilience in response to a stressor has been well-established (Bonanno 2004, Godschalk 2003, Hill, Weiner & Warner 2012), yielding extensive theory dealing with response to and recovery from disasters (Attinson, Eyal & Hornik-Lutie 2010, Walsh 2007, Agani, Landau & Agani 2010, Stevens, Berke & Song 2010, Cox & Perry 2011, Norris & Stevens 2007).

Norris and colleagues defined resilience as 'a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance', while community resilience derives from these capacities being networked (Norris *et al.* 2008). They suggest that resilience is a *process* rather than the *outcome,* reflecting adaptability rather than stability; but this is a contested view (Cox & Perry 2011).

Norris and colleagues also suggest that wellness results from community adaptation due to the process of resilience (Norris *et al.* 2008). By contrast, Murray (2004) considers wellbeing as part of resilience that affects the efficacy of the resilience response. In a further variation, Maybery and co-authors consider the terms are interdependent, with wellbeing being both a determinant and result of resilience (Maybery *et al.* 2009). Furthermore, it has been suggested that community resilience requires an ability to change rather than maintain the *status quo* (Steiner & Markantoni 2013, Zautra, Hall & Murray 2008). Community wellbeing is also primarily driven by social change. There is obviously no single endpoint when a community is 'well'. Thus, resilience and wellbeing deal with processes, with goal-setting and outcome attainment inherent in both systems.

A model is offered for the use of adaptive capacities to enhance community resilience, specifically in reference to disaster response (Norris *et al.* 2008). This involves five actions:

- addressing social inequities and vulnerabilities and buffering economic resources
- community participation in assessing and generating problem lists and solutions
- the capacity of support services to respond with efficacy to a crisis
- establishing buffers for existing social supports
- establishing trusted and flexible communication networks to enhance community response to future unknown insults.

These actions highlight the focus on preparing for or responding to a crisis event. The limitation of this focus following disasters is that they may ignore or subsume broader historical, social and cultural experiences of the community. Paradoxically, a community resilience focus may therefore limit the potential of a community to recognise and build on all its strengths.

Community wellbeing assessments

Assessment of community wellbeing is an emergent field that has arisen in response to the recognition of an individual's context within the wider community and the impact of this on wellbeing (Hancock, Labonte & Edwards 1999, Sirgy 2011, Sirgy *et al.* 2010, Mowbray *et al.* 2007, Holden & Phillips 2010, Jorgensen, Jamieson & Martin 2010, Hur, Narsar & Chun 2010, Florida, Mellander & Stolarick 2011, Wiseman *et al.* 2006). Assessment can support shared reflection on community strengths and opportunities, guide action, and allow for monitoring of change over time. The application of this field to community disaster response can be charted reasonably clearly, whereby the wellbeing of the community is considered in terms of its inherent and historical, as well as its enduring and emerging, attributes and characteristics in the context of a disaster.

Assessments of community wellbeing recognise that wellbeing at a community level does not necessarily equal the sum of the individual parts (Hancock, Labonte & Edwards 1999, Sirgy 2011). The factors that determine individual fulfillment do not always translate to benefits at the community level. Standard survey methods and subsequent statistical techniques may be inadequate to understand communities if they treat people in communities (i.e. respondents) as individual and independent cases—thus as isolated and unrelated 'units of analysis' rather than 'actors in social relations' (Abbott 1997). A number of authors have highlighted the need to expand analysis beyond the individual to the wider context of the community and the social interactions that they involve (Hancock, Labonte & Edwards 1999, Harms 2010, Hooghe & Vanhoutte 2011, Ryan-Nicholls & Racher 2004, Sirgy 2011).

While indicators and frameworks for understanding community wellbeing (Zautra, Hall & Murray 2008) incorporate different measures, there are common features including social assets, service provision, economic, environmental, and information and exchange (see Table 1). Evidence of the fundamental effects of these assets on community wellbeing is well established (Kutek, Turnbull & Fairweather-Schmidt. 2011, Maybery *et al.* 2009, Auh & Cook 2009, Mowbray *et al.* 2007, Norris *et al.* 2008, Davis, Cook & Cohen 2005, Hancock, Labonte & Edwards 1999, Cox & Perry 2011).

A framework of analysis comprised of a range of indicators is at the heart of many assessments of community wellbeing (Besleme & Mullin 1997). Hancock, Labonte and Edwards (1999) identified five factors to guide the choice of indicators:

- local involvement
- use of multiple stakeholders
- accessibility and relevance of the indicator
- measurement of factors that are significant, comparable and open to change
- applicability to the defined community and to community level analysis.

It has been suggested that these indicators should also be theoretically robust (Wiseman *et al.* 2006), include both objective and subjective measures, and be feasible

Table 1. Community wellbeing indicator domains.

Reference	Framework categories	Wellbeing indicators	Suggested domain(s)				
			Social assets	Service provision	Environ-mental	Economic	Information and exchange
Wiseman *et al.* 2006 *Measuring wellbeing, engaging communities: developing a community indicators framework for Victoria. The final report of the Victorian Community Indicators Project.*	Healthy, safe and inclusive communities	30	Yes	Yes	Yes		
	Dynamic, resilient local economies	10				Yes	
	Sustainably built and natural environments	19			Yes		
	Culturally rich and vibrant communities	8	Yes	Yes			
	Democratic and engaged communities	4	Yes	Yes			Yes
Maybery *et al.* 2009 *Resilience and wellbeing of small inland communities: community assets as key determinants.*	Social assets	11	Yes	Yes			
	Neighbourhood and economic resources	5		Yes		Yes	
	Community risks	4			Yes	Yes	
Davis, Cook & Cohen 2005 *A community resilience approach to reducing ethnic and racial disparities in health.*	Built environment	7			Yes		
	Social capital	5	Yes	Yes			
	Services and institutions	5		Yes			
	Structural factors	3	Yes		Yes		Yes
Hancock, Labonte & Edwards 1999 *Indicators that count! Measuring population health at the community level*	Sustainability	7			Yes		
	Viability	5			Yes		
	Livability	8			Yes		
	Conviviality	6	Yes	Yes			
	Equity	4				Yes	
	Prosperity	5				Yes	
	Education	4		Yes			
	Governance	6		Yes			

and parsimonious (Chrvala & Bulger 2010, Steiner & Markantoni 2013).

A range of indicators is essential to simplify and segment larger, more impenetrable issues (Steiner & Markantoni 2013). For example, the efficacy of the education system in a community may be assessed through school attendance and numeracy and literacy indicators. The challenge is to select indicators that address the concerns and values of the target communities, the information needs of governing bodies, and research requirements (Hancock, Labonte & Edwards 1999).

There is no single agreed measure or method of assessing community wellbeing. The studies listed in Table 1 provide some examples of community level assessments. They use a range of measures

and methods including extracting regional results of community wellbeing indicators from existing population-level surveys (Wiseman *et al.* 2006), conducting surveys of individual members to assess their perceptions of community (Maybery *et al.* 2009), and inviting key community representatives to use an indicators tool to score their own community against a set of community factors and priorities (Davis, Cook & Cohen 2005).

Questions about social ties between community members in individual surveys are an important inclusion in community assessment. Social network analysis is a specific, local-level relational method (Emirbayer & Goodwin 1994) that focuses on the 'relationships among social entities, and on the patterns and implications of these relationships'

(Wasserman & Faust 1994, p. 3). This analysis examines how social ties and individual attributes are associated (Robins, Elliott & Patterson 2001a, 2001b). Social network analysis, in conjunction with standard surveys, potentially offers greater opportunities for understanding communities as 'people in social interaction' than is possible by standard statistical methods alone.

Other community level options can be derived from ethnographic methods such as the use of local government and observational data. For example economic indicators could include number and type of local businesses, healthy environment indicators could include number and type of local recreational and community facilities, or social indicators could include details about local groups and their membership.

Conclusion

There are significant parallels in the principles and approaches used to measure both resilience and wellbeing, although there has been a greater focus on resilience in the disaster literature. Community resources, such as economic resources and service assets, have been highlighted as key factors in both wellbeing and resilience. The interrelationship between the two concepts is apparent, although the nature of that relationship is debated. Recognition of the wellbeing of a community, beyond its disaster experience, affords the potential for empowerment and self-reflection through a strengths-based lens. This provides a richer description of context than is gained by only using a resilience framework, which references the community assessment specifically to disaster preparedness and response. Holistic models and indicators are evolving to measure key characteristics of community wellbeing with scope to incorporate characteristics of resilience. This link between the theory and application of measures of wellbeing and resilience at a community level has only very recently been recognised. The potential is clear for researchers to integrate resilience and wellbeing to produce research that makes a significant contribution to both the literature and to communities; particularly in a disaster context.

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Resilience in the face of disaster: evaluation of a community development and engagement initiative in Queensland

Sarah Dean details a case study of Queensland local councils and assesses if funded programs deliver long-lasting community resilience. Ⓡ

ABSTRACT

Unprecedented hydro-meteorological events experienced during the 2010-11 'Summer of Disasters' led to all 73 Queensland local governments being disaster-affected. To assist communities recover from these events and build resilience for the future, a $40 million Community Development and Recovery Package was activated by the Australian and Queensland governments, under Category C[1] of the Natural Disaster Relief and Recovery Arrangements (NDRRA). Queensland's inaugural activation created a unique opportunity to explore the perceptions of participants about whether the program was effective in enhancing community resilience. The findings indicate that disaster recovery should be viewed within a broader framework of resilience. It identified the types of community development programs that can help people adapt, move forward and come together to develop skills and knowledge post disaster to enhance community capacity and resilience. Despite the program's overall success, significant challenges were experienced. This paper advocates for a greater focus on disaster prevention and preparedness, as opposed to response and recovery, and makes several recommendations to ensure future opportunities to foster long-term community resilience to natural hazards in Queensland are maximised.

Introduction

Many disciplines contribute to the field of emergency management and the contemporary literature reveals a grassroots, community-development approach to recovery and building resilience. Community-development approaches 'seek to empower individuals and groups by providing them with the skills they need, to take collective action to effect change, and to generate solutions to common problems' (United Nations 2001). This approach is increasingly recognised by emergency management academics (Mileti 1999, Paton & Johnston 2001, Smit & Wandel 2006, Norris *et al.* 2008, Mulligan & Nadarajah 2012) and practitioners (Attorney-General's Department 2003). In an emergency management context, recovery is often conceptualised as 'returning to normality' (Deloitte 2013 p. 5), which 'neither captures the changed reality after disasters nor encapsulates the new possibilities' (Dufty 2012, p. 40). Resilience on the other hand not only considers the 'capacity of communities to absorb shocks, retain their basic function and structures and bounce-back' (Kirmayer *et al.* 2009) but also the ability of communities to thrive in the face of disaster (Coles & Buckle 2004, Maguire & Hagan 2007). This perspective seeks to understand positive responses to adversity at the individual and community level (Cutter *et al.* 2008, Paton & Johnston 2001) and advocates for 'a new conceptualisation of normal' (Norris *et al.* 2008, p. 132).

Every year, Australian communities face devastating losses caused by natural disasters (COAG 2011). During 2010-11, the El Niño Southern Oscillation climate phenomenon caused the strongest La Niña pattern since 1974 (Bureau of Meteorology 2011a) bringing above-average wet weather to Queensland. Significant flooding followed by the impact of *Tropical Cyclone Yasi*, led the then Premier Anna Bligh to declare '75% of Queensland a disaster zone' (cited in AAP/One News 2011). On 6 April 2011, as a result of extensive damage, the Australian and Queensland governments announced funding for a $40 million Community Development and Recovery Package. Five days later, the *National Strategy for Disaster Resilience* was endorsed; an approach that recognises that 'individuals and communities need to be self-reliant and better prepared to take responsibility for the risks they live with' (COAG 2011).

Australia is not alone. Building and enhancing disaster resilience is a key strategic goal for governments around the world, evidenced by the *Hyogo Framework for Action 2005-2015* (UNISDR 2005) and the recently adopted *Sendai Framework for Disaster Risk Reduction 2015-2030* (UNISDR 2015).

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1   Category C relates to assistance for severely-affected communities, regions or sectors when the impact of an event is severe. It includes clean-up and recovery grants for small businesses and primary producers and/or the establishment of a Community Recovery Fund.

The 2010-11 'Summer of Disasters' and the consequent activation of the Community Development and Recovery Package in Queensland created a unique and unprecedented opportunity to evaluate perceptions of participants as to whether a community development approach, delivered by local government post-disaster, has been successful in helping communities recover and in identifying the degree to which adaptive strategies have been used to build capacity and resilience. Recommendations to encourage learning from both the successes and shortcomings of Queensland's inaugural implementation are identified.

Method

The study employed a mixed-methods approach to collect accurate, contextual data on implementation in Queensland[2]. Tablelands Regional Council was selected for the case study to provide a 'real life' example of how theory, policy and practice converge (Yin 2011). A focus group in the case study area explored projects implemented at the community level to elicit rich, qualitative data from residents on their experiences of the program. Purposive sampling targeted seven community disaster teams, formed under the auspices of this program. Eight residents participated in the focus group (75 minutes) and a further four participated remotely, providing written responses to questions posed at the session.

Another method of inquiry was to conduct semi-structured interviews with community development officers employed under the package (n=5). These in-depth interviews (average 90 minutes) explored worker perspectives and experiences with regards to program implementation at the local government level in Far North Queensland. Interviews were also undertaken (n=3) with the organisations responsible for administering the funding to explore their perspective on strategic implementation across Queensland. The final method of inquiry was an online survey[3] that was sent to every community development officer employed under the package in Queensland (n=22). The survey questions built on the themes identified from the focus group and interviews and took around 20 minutes to complete. A response rate of 50 per cent (n=11) was achieved that helped validate the results and provide broader perspective.

Data collection and analysis occurred simultaneously. The focus group and interviews were recorded (audio) and later transcribed verbatim. Transcripts were read in their entirety several times to identify key words and phrases and were coded (Auerbach & Silverback 2003) to identify trends, organise ideas, and to assist with comparing and contrasting identified approaches, methods and practices. The continual synthesising and repeated reorganising and coding of data resulted in a good understanding of the themes characterising the research. The mixed-methods approach ensured consensus and validity across multiple data sources (interviews, focus group and survey) that strengthens the reliability of the findings through data triangulation (Guion, Diehl & McDonald 2011).

Limitations

All 73 local governments received some funding under the Community Development and Recovery Package. The councils targeted for this research were the 17 that received funding under the Community Development and Engagement Initiative (CDEI) component; the councils deemed 'hardest hit by the flood and cyclone disasters' (Queensland Reconstruction Authority 2011, p. 12). The small sample size involved in this study reflects qualitative research methods. However, themes were validated across multiple data sources with strong links to previous studies on community resilience. The results are not claimed as indicative of all participants in the program and it is recognised that other communities, regions, states and nations need to consider the recommendations identified in their own context.

Results

Case study

Tablelands Regional Council, located 100 km west of Cairns in Far North Queensland has a population of 43 727 people, dispersed across 65 008 km[2] (Australian Bureau of Statistics 2011)[4]. On 3 February 2011, very destructive winds from *Tropical Cyclone Yasi* hit the remote southern area of the region (Figure 1) causing severe damage to 34 cattle stations. Fallen trees blocked access roads, destroyed cattle yards and damaged thousands of kilometres of fencing that led to problems with mustering and straying stock. Two homes in the region lost roofs and extended loss of power and communications hampered the recovery efforts of small business (Tablelands Regional Council 2011).

Tablelands Regional Council received $700 000 grant funding under the Community Development and Recovery Package. Exemplar projects delivered in communities were identified as the Community All-Hazard Disaster Plans and associated Skills and Capability Training Program (CDO, Community Members). The plans involved community members determining local responses to disasters (Walia 2008) and in 'formalising what already happens in smaller communities [by] identifying resources in the local area that can be deployed to assist the community' (CDO, Community Members). During this project, seven community all-hazard disaster plans were developed by residents and adopted by the Local Disaster Management Group. Additionally, community members were sponsored to obtain chainsaw tickets (n=284), first aid qualifications (n=246) and attend numerous other skill training courses for example, radio communications and leadership (n=798). In many communities, residents initiated their own projects. The Disaster Information Notification Network is one example where a proactive resident established an email network to communicate with 300 other residents on emergency-related issues.

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2   The research was undertaken between December 2012 and April 2013 (CSU HREC Approval #110-2012-17).

3   Survey participation was voluntary and anonymous.

4   This research was undertaken during 2013. On January 1 2014, the new Mareeba Shire Council was formed as a result of de-amalgamation from the Tablelands Regional Council.
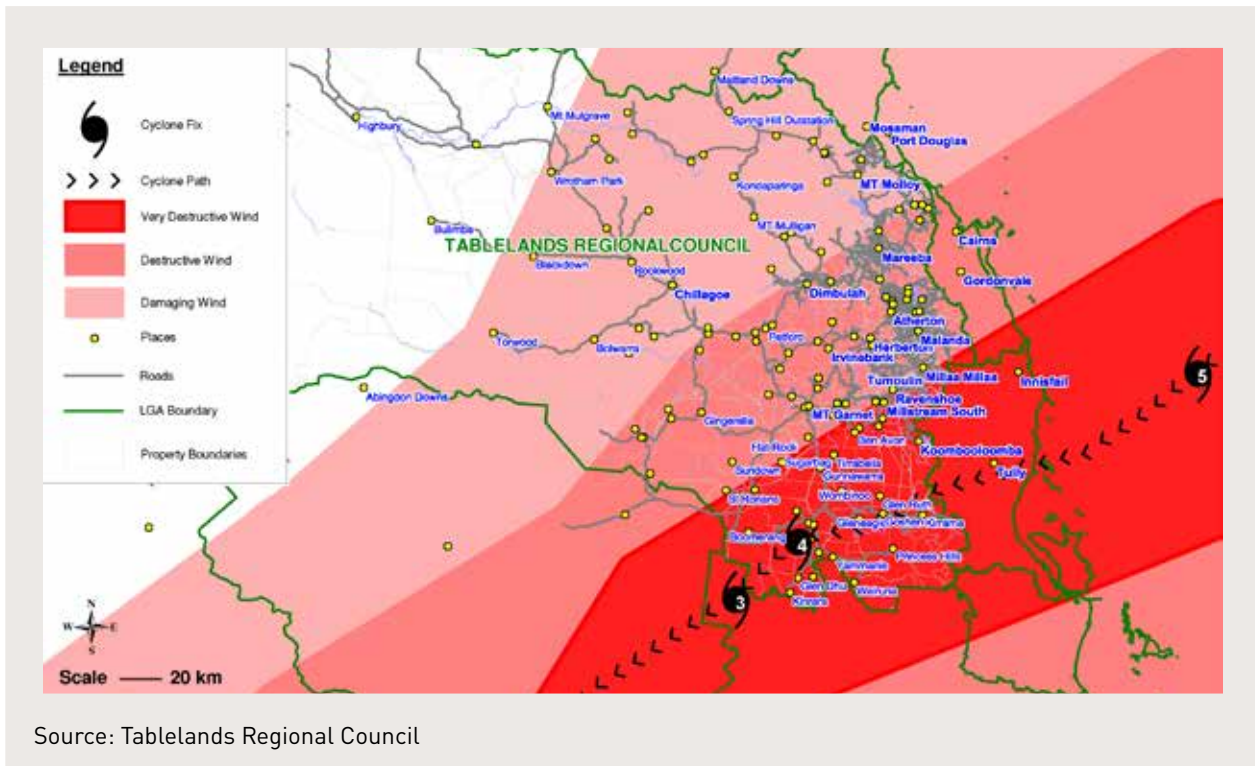
Source: Tablelands Regional Council

Figure 1: *Tropical Cyclone Yasi* impact on Tablelands Regional Council local government areas (LGA).

The case study results demonstrate that the Tablelands region is proactively supporting a whole-of-community approach to emergency management and has implemented initiatives aimed at empowering individuals and communities to build their own resilience. The approach recognises that 'people need to be empowered, actually encouraged to shine in times of disaster' (Community Member) and that while 'local government is the lead agency, local communities can self-help to a certain extent by commencing recovery operations until external resources arrive' (CDO, Community Member). These projects clearly link to the community resilience literature covering areas such as hazard and risk awareness (Walia 2008), social support and networks (Dufty 2012, Pooley, Cohen & O'Connor 2010), community competence (Dufty 2012, Pooley, Cohen & O'Connor 2010), and sense of community (Pooley, Cohen & O'Connor 2010, Veil 2008).

Community Development and Recovery Package – benefits and successes

The program was developed from research into 'ways in which community development approaches...had aided other places in Australia and around the world' (Funding Body #7). It was a 'welcomed program' (CDO #2, 6, Community Members) aimed at 'supporting communities to reconnect, heal, remember and move on from the events' (Funding Body #8) and 'to assist with preparedness and growing resilience' (CDO #2, 3, 6). The importance of 'grassroots activities' was acknowledged (CDO #2, 6) and it was recognised that 'outcomes would be better, if driven by the community' (CDO #3, Community Members). These findings infer that participants had a good understanding of the intent of the program.

Results revealed that community warden schemes, preparedness packs, resilience toolkits, resilient leader networks, special-needs resources and capability training programs were delivered across Queensland. These projects clearly value-add when considered in a disaster resilience context. To help validate findings, survey respondents were asked whether their key projects linked to categories extracted from the community resilience literature. Table 1 shows the results, indicating that projects delivered can be linked to the normative conditions associated with competent and resilient communities.

One funding body (#4) revealed that '320 fantastic and innovative projects had been rolled out across the State and almost 300 000 points of engagement recorded across the program'. While claims of success need to be considered in the context of the role of the funding to garner support for the program and boost positive opinion for the state government, results from the survey data indicate that 91 per cent of participants thought that a community development approach to disaster recovery and building resilience had proven effective in their own community (Figure 2). This perspective was also supported in the practitioner interviews. The remaining nine per cent of survey participants stated they were unsure because the outcomes had not yet been tested in a real event[5].

The program was identified as 'the largest investment of funding into this type of community development practice' (Funding Body #7). Survey respondents were asked to identify implementation costs for exemplar projects in their communities. The results indicated

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5 Anecdotally, there is some evidence to suggest enhanced resilience was demonstrated in areas re-affected by flooding in 2013 and again during *Tropical Cyclone Ita* in 2014.

Table 1: Participant perspectives on how exemplar projects implemented in their communities link to community resilience.

Category / normative condition	Community resilience literature	Proportion of responses (%)
Capacity Building	Ireni-Saban 2012	19
Education and Training	Walia 2008	19
Social Connectedness and Empowerment	Dufty 2012 Pooley, Cohen & O'Connor 2010 Norris *et al.* 2008	15
Sustainability	Tobin 1999	12
Awareness of Hazards and Risk	Walia 2008	8
Health and Spiritual Wellbeing	Fernando 2012 Walsh 2007	8
Adaptation Skills	Smit & Wandel 2006 O'Sullivan *et al.* 2012	4
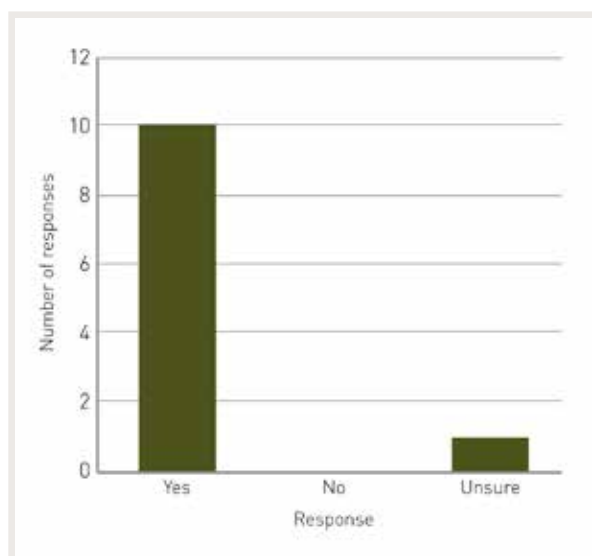
Figure 2: Survey participant perspectives on whether a community development approach to recovery and resilience building had been effective.

60 per cent of projects cost less than $15 000 to implement, demonstrating that resilience-building initiatives are not necessarily costly. Data revealed that the funding was beneficial, but the real value was identified as the human resource embedded within councils to drive projects at the community level (Funding Body #7, CDO #1, 3, 6, Community Members). A 'lack of human resource to drive initiatives' (CDO #2) and a 'lack of budget' (CDO #6) were identified as possible reasons that most councils were not actively engaged in delivering community-based disaster resilience building initiatives to communities prior to the commencement of the program.

Community Development and Recovery Package – challenges

The tendency of governments to 'throw resources at disasters after the event…' (CDO #3) was recognised by participants. This criticism of funding is not new (Board of Natural Disasters 1999). Some workers considered the money 'a bit of a hindrance' (CDO #3) in that it created 'reliance on funding and built dependency' (CDO #2). Projects explored in this context included movie nights, fishing competitions, music festivals and pamper nights. While such activities met the terms of the funding agreement, because the 'social inclusion aspect encouraged people to participate in community-based activities' (CDO #2), the link to disaster resilience was identified as tenuous as it is difficult to envisage how such activities build capacity to deal with future natural hazard events. The need for psycho-social bonding activities is not disputed but the delivery of programs by local governments could establish a precedent and possibly create unrealistic expectations for future events. This indicates that recovery activities need to be viewed within a broader framework of resilience and that local governments need to engage in activities that do not undermine or potentially create unintended negative consequences for a community's future resilience. Nor should they place further strain on the limited resources available for response, recovery and reconstruction efforts. A related theme that emerged was the limited interaction between the disciplines of emergency management and community development where there is no clear linkages or cross-pollination of ideas at a state or local government level (CDO #1, 3, Funding Body #8). It is argued that improved collaboration between practitioners may have helped to identify projects with the potential to inadvertently foster future expectation or reliance on government funding or services.

Another consistent theme related to 'evidence of disconnect' (Funding Body #7, CDO #1, 3, 6). There was 'pressure to get the money out quickly and so existing relationships with councils were used [resulting in] administrative complexities that hadn't been anticipated' (Funding Body #8). The 'three separate organisations administering the funding program, that ultimately reported to the same steering committee, appeared to have vastly different requirements' (CDO #3) and there was significant ambiguity in funding agreements (CDO #1, 2, 6). Workers unanimously identified high reporting demands and limited timelines. Some perceived the program to be about compliance as opposed to achieving the best possible outcomes for communities (CDO #2, 6).

NDRRA funding is offered for a maximum of two years with no longevity of programs or workers, revealing the final theme—sustainability. Participants recognised that community development is a long-term approach and many felt the program was 'just starting' or 'finishing too early' (CDO #2, 3, 6, Funding Body #7). To validate results, survey participants were asked whether the projects they had implemented were sustainable once the funding ended. Only 45 per cent of respondents said yes and while nobody said no,

55 per cent of respondents stated they were unsure, demonstrating that a significant proportion of projects have the potential to fail in the longer-term (Figure 3). This is a key risk because 'there is a danger of the program being a waste of money' (CDO #3). 'If [the program] is not sustained, you might get a year or two of benefit, but without a driving force it will probably fade away' (CDO #5).
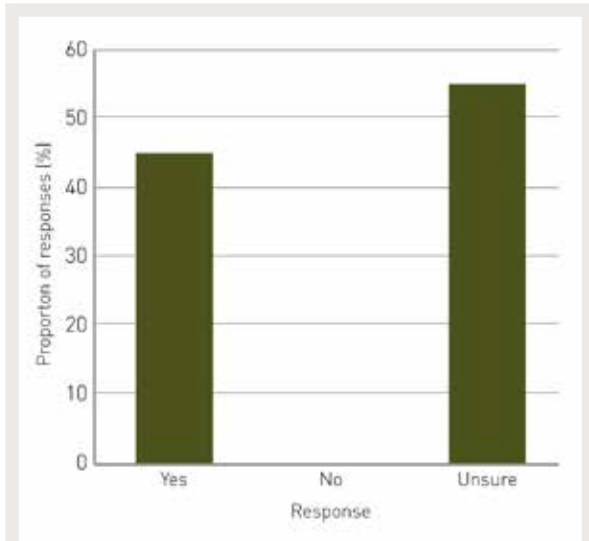
Figure 3: Participant perspectives with regard to sustainability of projects implemented in their communities under the Community Development and Recovery Package.

Discussion and recommendations

Recommendation 1:
Develop alternative funding models that focus on disaster prevention and preparation as opposed to relief and recovery

Future funding models for disaster management need a stronger focus on prevention and preparation, as opposed to the current model. The NDRRA predominantly focuses on the relief and recovery phases of an event. It is recommended that the Community Development and Recovery Package be removed from the NDRRA. The NDRRA is suited to the relief and recovery context because its design has no longevity. This is detrimental to resilience because resilience requires an ongoing, sustained effort and continual development and nurturing. The model of financing disasters after they have occurred is flawed and is systemically contributing to creating reliance on relief and recovery funding. The role of government is not to try to 'fix' disasters. Instead, local governments need to be supported to adopt a whole-of-community approach to emergency planning and management. Local governments need to invest in community development approaches that enhance resilience while building capacity to support members of the community should the effects of an event be beyond their capacity to cope.

Recommendation 2:
Streamline administrative components of the Community Development and Recovery Package to improve future delivery

The administrative complexities associated with the inaugural implementation of the Community Development and Recovery Package need reviewing to streamline future implementation. It is recommended that issues relating to ambiguity of the funding agreements, unification of delivery and reporting requirements to three different funding agencies, and support for workers and the limited timelines are addressed prior to any future implementation of the program under an alternative funding model. Furthermore, a clear set of monitoring indicators and outcomes need to be outlined in the development phase of such programs and for each project so that benefits can be clearly identified and any unintended consequences mitigated.

Recommendation 3:
Forge stronger linkages between emergency management and community development professionals to ensure the best possible outcomes for community resilience

Further improvements relate to the limited interactions between the disciplines of emergency management and community development practitioners identified during the program. Recovery and resilience are distinctly different strategies, but need to be integrated holistically at a local government level to ensure the best possible outcomes for communities. A partnership approach between emergency management and community development professionals (with a shared vision and common approach to building resilience to natural hazards) will help strike the correct balance between recovery and resilience-building activities. Improved collaboration at practitioner level will also help identify and resolve potential conflicts that arise. This ensures programs do not create negative or unintended consequences for a community's future resilience, or inadvertently create future expectations or reliance on government funding or services.

Conclusion

The funding was a significant investment on a relatively untested program. Despite a number of challenges, it has achieved some levels of success in enhancing community resilience, at least in the short-term. It has helped people come together on projects that enhanced their skills and knowledge and built self-confidence, community capacity and cohesion. There are numerous case studies from around the world about building resilience to disasters using a community-development approach and this study builds on that research. It provides further evidence for a whole-of-community approach to emergency management. Adoption of these recommendations will inform future decision-making and policy direction and lead to greater opportunities to foster longer-term community resilience to natural hazards in Queensland.

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Understanding resistance to emergency and disaster messaging

Dr Lynda Shevellar, The University of Queensland, and Rebecca Riggs, Crisis Ready, examine why some people choose not to abide by official safety warnings. ®

ABSTRACT

Individuals make decisions and act on them during emergencies and disaster events. Many of those choices are made in accordance with official advice: 'be prepared', 'keep clear', 'watch and act', 'if it's flooded, forget it'. Some of them are not. This paper explores why some people choose not to abide by official safety warnings, the factors involved in their decision making and actions, and what this means for emergency communicators. Through analysis of interviews with people who have made choices that differ from public safety advice, there is a need to better integrate the understanding of human motivation to improve models for communication in emergency and disasters.

Introduction

How to keep people safe is at the core of emergency management. Yet there are some people who disregard disaster messaging, seemingly against self-interest, with sometimes devastating consequences. The tragedy of disasters is not just that loss of life occurs, but that much of this loss is predictable, and hence preventable (Fitzgerald *et al.* 2010, Ryan & Matheson 2010). There is a need to understand how the empirical knowledge of emergency management can assist community members to act in ways that maximise their chances of survival (Gaillard & Mercer 2013, Palttala *et al.* 2012). There has been considerable recent research into channels of communication, emerging and social media, and the applicability of new technologies. However for these to be maximised, developments need to be matched by a deeper understanding of how people receive and make sense of information in ways that inform behaviour (Bushfires and Natural Hazards Cooperative Research Centre 2013). In examining international literature and disaster reports in Australia over the last decade, the question of 'How do we get people to behave appropriately during disasters?' was identified as one of the largest gaps in both national and international research

(Goode *et al.* 2013, p. 56). The research informs the discussion by examining the outliers of communication efforts: those who appear to resist the messaging of emergency management authorities.

Literature review

Emergency communication is informed by multiple overlapping disciplines and perspectives. For clarity these have been separated here as three bodies of research: communication theory, social cognitive theory, and neuropsychotherapy.

Communication theory

The first broad approach is grounded in traditional communication theory and looks at how messages are conveyed and received. It has recently been applied to the role of social media and live data capture in emergency communication. Recent research has considered how people find out about emergencies, who transmits messages and how such messages are received and mediated by receivers (Ryan & Matheson 2010, Spiro *et al.* 2012).

Investments in emergency communication have often focused on the accuracy, timing and appropriate detail level of information, on means of transmission and reception, and on source reliability. Underpinning such investments is the idea that the more information the mass media and citizens have, the better they will be able to react and respond (Wagman 2003, cited Quarantelli, Lagadec & Boin p. 38).

Much valuable policy (for example Attorney-General's Department 2008) responds to Mileti and Sorensen's (1990) focus on the process of hearing, understanding, believing, personalising, confirming and acting. They integrate and enact advice that messages be repeated, simple and clear, accurate, targeted, consistent and include a call to action. Many emergency services organisations in Australia and internationally, such as the United States Centers for Disease Control (2014), use these communication frameworks as the basis of their practice.

Social cognitive theory

The body of work regarding social cognitive models seeks to contextualise meaning-making sociologically and psychologically. Paton (2008) observes that risk communication has focused more on the messages it provides than on the relationship between citizens and the civic agencies responsible for risk communication. Yet it has been demonstrated that simply having information is not enough to change behaviour (Paton *et al.* 2006).

Recovery research has examined the psychological needs of the community in terms of communication (Nicholls & Healy 2008) and the field of environmental sociology has highlighted the essential role of recreancy, discussing the level of trust community members place in organisations and the perceived credibility of official messaging (Tierney 2012).

Emergency organisations have responded to this awareness by reworking strategies to acknowledge and mitigate 'psychological barriers' and build community engagement programs into organisational capacity (Centers for Disease Control and Prevention 2014, p. 23, Australian Red Cross 2010).

Neuropsychotherapy theory

Such insights into the experience of those receiving messages in emergencies are deepened by advances in neuropsychotherapy. At the core of this examination of brain function and its relationship to emotion, cognition and behaviour, is the work of Klaus Grawe (2007). He articulates four basic needs that drive action and choice, particularly at times of stress:

- attachment
- control
- desire for pleasure and avoidance of pain
- the need for self-enhancement and identity.

Neuropsychotherapy provides an additional lens through which to observe communication in the emergency context. It suggests that while repeated, punchy slogans are appropriate aids to memory during emergency, they are only likely to be effective when they sit upon a cognitive structure that connects to the core drivers in each individual and have been built earlier, during periods of relative calm. The present research project complements this body of knowledge by examining how people experienced emergency situations and disasters, how they made sense of their own stories, and what drove their decision to ignore warnings from authorities.

Methodology

The focus of this research is to examine people's stories and perceptions of their choices, thus a qualitative methodology was employed. In-depth, semi-structured interviews were conducted with individuals who had acted counter to official messaging. A regional NSW site was chosen that experienced two recent floods following an extensive drought period.

Participants were recruited via numerous methods including: (largely unsuccessful) attempts to recruit directly through emergency management agencies, a Facebook page, a letter of invitation circulated through networks via email, and an interview by a local radio station, which promoted the project on-air, resulting in a number of follow-up calls. After people were interviewed, they were invited to consider anyone who might also have a story to share, who could, if willing, contact the researchers. Chance encounters while conducting fieldwork also provided subjects, including a taxi driver and a café customer.

Fourteen people volunteered to share their stories, comprising seven men and seven women, with ages ranging from 25 to 61 years.

Two researchers were involved in data collection. Planning and discussion confirmed a unified method and initial interviews were conducted in tandem to calibrate the research process. During interviews, a process of deliberate disconfirmation was employed (Dick 1999). As each theme emerged the researchers would use the subsequent interviews to deliberately probe for disconfirmatory evidence, providing additional rigor for the qualitative study. Thematic analysis was then employed to examine and understand the data.

Findings and discussion

Decision-making in emergency and disaster

The results reported are part of a pilot project and therefore indicative. However there are some useful patterns worthy of reflection that echo work in the field of neuropsychotherapy (Allison & Rossouw 2013).

About the participants: who is resisting disaster communication?

Media reports and industry hearsay would suggest that the majority of people who act counter to emergency messaging are risk-taking males, aged 18-25. However only one male from this age group appeared in the study (a 25-year-old) and the mean age of participants was 40. Furthermore, far from being prone to high-risk activities, the majority of participants, such as Pamela, saw themselves as cautious and thoughtful.

> 'Afterwards I wondered why I did it, because I'm quite a sensible person. I don't take risks.'
> (Pamela, aged 48)

Participants worked in a variety of mainstream occupations including teaching, farming, telecommunications, administration and firefighting. This suggests that resistance to communication may not belong to any particular cohort, but is person-specific and context-specific.

None of these people required intervention from emergency services personnel, and thankfully, none ended in tragedy. Although, as Natasha observes:

> 'It was an informed decision but it wasn't the right decision. It worked out all right – but it wasn't right.' (Natasha, aged 36)

As near-misses that 'worked out all right' these incidents are absent from statistics and media coverage suggesting that assumptions about target populations may miss large unrecorded sections of community and that safety messages are 'resisted' more frequently than is currently recognised. This gives additional impetus to better understand the circumstances surrounding these choices.

The pull of attachment

The most common driver exhibited was attachment, which refers to connection and commitment to significant others. This emerged in over 70 per cent of interviews, with people's attachment needs compelling their actions. What was surprising was that contrary to the researchers' expectations, the majority of stories were not cases of reaching loved ones at risk. Penny (aged 29), who said 'I wanted to get home to mum' later revealed that her mother lived in another town. Action was not motivated by the urge to save someone, but the need to simply be with those they loved at a difficult time. For at least five of the participants this idea went even further: they actually increased their own risk in order to meet the goals of the person they loved.

> 'Other people were relying on her. When we got there I felt I had fulfilled my mission. I didn't care about the car. I didn't care about me …. I would've carried her through the water… the smile on her face made it all worthwhile.' (Christen, aged 61)

Attachment can include relationships with places, animals and groups of people. For one participant it was her son's attachment to the family pet (as well as hers to him) that guided behaviour.

> 'I didn't really look at the water around me. I just walked in, with my 11-year-old son alongside me… He kept saying, "Sooty is in the house drowning".' (Pamela, aged 48)

For another participant, his relationship with his house was of greatest value. He ignored evacuation orders and stayed, despite the evacuation of his pregnant partner. As he explained:

> 'I built it myself… I am quite invested in the house.' (Paul, aged 41)

The need for control

For one-third of participants what was important was the need for control: to be able to exercise agency, to act in accordance with their own perceptions and needs, and perhaps, to influence others.

> 'They wouldn't have a clue. The rules are worked out by people in Sydney who've never seen a flood. I live [here]!' (Simon, aged 25)

This links with concepts of self-efficacy and the extent to which people trust the institutions providing advice. There was little direct criticism of agencies, but a consistent need as expressed by Marion.

> 'We don't want to be told to go just because a river is at a certain height. We want the information and then be allowed to make our own decisions.' (Marion, aged 55)

Moving away from hardship towards pleasure

The idea of reckless pleasure-seeking is often discussed as motivation for resistance to messaging. Ubiquitous images of adolescents wake-boarding show up in the media during disaster coverage. In the present research this was not evidenced. However the third theme to emerge from people's stories was that of stress avoidance, which can be seen as the converse of pleasure-seeking. This was most clearly portrayed by a mother reflecting on her drive through floodwaters with her family in the car.

> 'I had a baby who was asleep but needed feeding and two girls in the back seat. We needed to get them home… Feeding [the baby] was big on my mind… a screaming child in the car would've been awful. Our priority was keeping everyone quiet and getting home to feed [the baby].' (Haley, aged 39)

There is a survival-driven inclination of humans away from things that are unpleasant towards things that give pleasure. For this mother, the floodwaters rising around her were seen as less stressful than her baby waking, hungry and screaming. This inclination also explains why people took risks and put themselves in harm's way, simply to avoid the banality of waiting for the disaster to be over.

> 'I didn't like the motel. I was tired. I was over it. So I packed up the car with muesli bars and water. I'd had enough of this whole flood thing.' (Natasha, aged 36)

The urge to move away from boredom and frustration was a stronger driver than consideration of any potential risk.

The power of identity

The fourth aspect that arose was that of 'identity'; people's sense of self, and their way of doing and perceiving things. This theme integrated and reiterated many aspects of the other core motivations.

Simon's identity as a farmer, his sense of self-efficacy and his capacity to make hard decisions, was evident.

> 'You know you've got to respect the flood … but farming is all about educated risk. If I was worried about every risk I wouldn't get out of bed in the morning.' (Simon, aged 25)

The power of identity was revealed within contradictions in people's accounts.

Christen revealed that she was actually very aware of the risk she had been prepared to take to get her daughter to a dance recital.

> 'My daughter was getting more and more agitated... I kept saying to her "I'll get you there I'll get you there." That's what the captain of the Titanic said, I think.' (Christen, aged 61)

Christen's knowledge of risk was, however, overwhelmed by her identity as a good mother, her attachment to her daughter, and her desire to move away from the stress of her daughter's agitation. These were the drivers that motivated her choices, her decision-making, and her actions.

Conclusion

This research speaks to a growing body of interest in emergency communication. As flagged in the literature review, there are numerous conversations about the appropriateness of certain strategies, message delivery, channels, intended audiences and, indeed, the messages themselves. Emergency agencies often create campaigns and messages based on significant audience analysis and strategic and marketing advice.

The problem for practitioners is that many communication strategies rest on assumptions that with the right information, constructed into simple, credible consistent messages conveyed with empathy and commitment to break through psychological barriers, that people will make the 'right' decisions. What this pilot project suggests is that the very question of what is 'right', sits at the heart of the decisions being made. It is not that people do not understand the danger, but rather that they have a different value system at play in assessing the risks. In fact several participants praised the various safety messages and emergency services agencies but simply didn't perceive any relevance to their own particular circumstances or needs.

Frustrations in disaster management often centre on assumptions that those who act against official warnings do so because they are ill-informed, thrill-seeking, or completely incapable of decision-making. The individuals in this study were not simply engaged in moments of spontaneous stupidity. They made conscious choices, weighed pros and cons, evaluated their options and made a decision in favour of urgent motivations of relationship, identity, the need to move away from stress and the need for a sense of control. 'Turn around, don't drown' and 'If it's flooded, forget it' were not powerful enough to override the more innate and often unconscious human drivers.

It is not that such messages are wrong – it would seem that for many people they work. However there are those who can't simply turn around and forget it. They need more than simple slogans. They need feasible options. They also need to understand these options at a deep level and have them integrated into their world view.

Further work is necessary to confirm the findings made here and to create solutions to the challenges arising. Perhaps however, if long-term messaging is constructed that acknowledges and responds to core needs and motivations, we have a better chance to keep people safer in ways that make sense to them.

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Ravenshoe Café explosion: Tuesday 9 June 2015

By Sarah Dean, Senior Advisor Disaster Management, Tablelands Regional Council

On 9 June 2015, an out-of-control four-wheel-drive vehicle hit and punctured a 450 kg gas cylinder outside the Serves You Right Café in the main street of the small town of Ravenshoe in Far North Queensland. A release of gas caused an explosion and fire. The accident occurred at lunchtime and 20 people were injured, some critically. Two local women later died from their injuries.

The emergency services were alerted and, although Ravenshoe has a limited emergency services presence, the local Fire, Ambulance and Police responded within minutes of the 000 call. It took another 40 minutes for the closest back-up units to arrive from surrounding towns, which were later augmented with units from Cairns, approximately two hours away. In the interim, at least 100 community members converged on the scene and became the first responders to this major incident.

At a community-led meeting held three days after this event, Queensland Ambulance Service Clinical Support Officer, Paul Sweeney, paid tribute to the support provided by local residents during the ordeal.

'The assistance provided by the community of Ravenshoe in light of this tragic event was unprecedented. From the cooling and wrapping of burns and the provision of emotional support, to assisting with the manual handling of patients and equipment; all of this enabled the attending paramedics to provide advanced life support measures and transport the injured to receiving hospitals at the earliest opportunity,' he said.

The following week at the Ravenshoe Café Explosion Recovery Group meeting, formal tribute was paid to Tablelands Regional Council for the work undertaken on community resilience over the past few years. Special mention was made of the Community All-Hazard Disaster Plans project and the free first aid training

Image: Darrin Leonard, Ravenshoe

Ravenshoe community members converged on the scene and became the first responders to this major incident.

provided to community members. This was identified as having a significant impact on the confidence of community members to respond to this incident and to provide assistance to others.

The Ravenshoe community was severely impacted by *Cyclone Larry* in 2006. This experience led them to actively work together to prepare for the next emergency. Following *Cyclone Yasi* in 2011, this community-led approach was recognised by Tablelands Regional Council and the Community All-Hazard Disaster Plan project was initiated and rolled out across the region. The work undertaken on community resilience over the last few years with small communities has helped provide residents with relevant skills and training to build community competence and capacity.

The existing social support networks in Ravenshoe, together with a strong sense of community, has enabled residents to respond cohesively in the face of disaster and to come together to lead their own recovery.

Emerging technologies for risk reduction: assessing the potential use of social media and VGI for increasing community engagement

Billy Haworth, Bushfire and Natural Hazards Cooperative Research Centre and University of Sydney, Eleanor Bruce, University of Sydney, and Peter Middleton, Tasmania Fire Service, look into the use of volunteered geographic information technologies. ®

ABSTRACT

Each year Australia is prone to potential negative and devastating impacts of bushfires and other natural hazards, highlighting the importance of community engagement in disaster risk reduction. Volunteered geographic information (VGI) is an emerging technology that allows members of the public to voluntarily contribute geographic information, predominantly through sources such as social media, photo and video sharing platforms, and online map-making software. The potential role of VGI in disaster response has been documented in recent years, but VGI for community preparation has received less attention. This research explores the potential role for VGI to foster community engagement in bushfire preparation and to empower and build disaster resilience for Tasmanians. Through collaboration with the Tasmania Fire Service, a survey of 154 participants across 12 communities at bushfire risk in Tasmania has quantified trends in individual and community preparedness and VGI and social media use. This paper provides an evidence base for both the use of VGI technologies in bushfire preparation initiatives and directions for further research.

Introduction

Australia is prone to the devastating impacts of bushfires and other natural hazards. Climate change and increased global warming means extreme weather events such as bushfires, floods and heatwaves are predicted to increase in both frequency and intensity (IPCC 2012). Adequately preparing for disasters can dramatically reduce the risk to life and assets (Paton 2003). Yet, despite efforts to educate communities with relevant and up-to-date information, research has shown individuals in at-risk communities still may not actively engage in risk reduction activities (Frandsen 2011). Innovative approaches are needed to involve communities in disaster preparation to reduce risk and build resilience. Social media and other online geographic information communication technologies are increasingly providing opportunities to connect communities. The role of these technologies in disaster response has been well-established in recent years, however, research into their utility in the pre-disaster phases of the emergency cycle remains relatively limited (Haworth & Bruce 2015). This article presents findings of a study examining the potential role of social media and other online geographic information technologies in fostering community engagement in bushfire preparation in Tasmania.

Social media are internet-based applications that enable people to communicate and share resources (Taylor *et al.* 2012). Other geographic information communication technologies referred to in this article include online map-making software open to public contributions (e.g. Ushahidi Crowdmap, OpenStreetMap) and devices such as smartphones, which enable collection, creation, and sharing of data in unprecedented ways. The widespread engagement of the public to voluntarily produce geographic information using these technologies is referred to as volunteered geographic information (VGI) (Goodchild 2007). Prior to the emergence of VGI, community geographical information was collected through focus groups, surveys, and community discussion, with local, traditional, and indigenous knowledge shown to be useful in both environmental management and disaster mapping (Prober *et al.* 2011, Tran *et al.* 2009). Despite significant challenges, particularly those of data quality, accuracy and credibility (see Flanagin & Metzger 2008, Elwood, Goodchild & Sui 2012), VGI in disaster management allows for cost-effective rapid collection and dissemination of diverse local information, with large amounts of data collected in near real-time. It enables increased connectedness with communities and authorities and facilitates the understanding of local risk through the mapping and sharing of local knowledge.

This paper builds an evidence base for the use of VGI in building resilience through community engagement.

More specifically, this study aims to determine for the study sample in Tasmania:

- the proportion of community members actively engaged in bushfire preparation

- the proportion of people that use VGI, the social media tools they use and purpose of use

- how many people use or would use VGI (and to what extent) in bushfire preparation.

Analysis of VGI generation methods is not within the scope of this work but rather is the focus of ongoing research.

Bushfire in Tasmania and community engagement

In Tasmania, bushfires are the most economically disastrous of all natural hazards (Frandsen 2012) and the impacts on communities are long-lasting. Tales of the 1967 Black Tuesday fires around Tasmania's capital, Hobart, which caused 62 deaths and destroyed over 3 000 buildings (VBRC 2009), are recalled frequently, even by those who weren't present (Frandsen 2012). In January 2013, disastrous bushfires swept across the south east of Tasmania, destroying 203 residential buildings with an overall financial cost in the order of $100m (DPAC 2013). This event was a major driving force behind Tasmania Fire Service's (TFS) continued efforts to increase community engagement in risk reduction activities.

Research indicates that developing community bushfire preparedness programs based on community engagement is effective, sustainable, and economical (Frandsen 2012). The TFS Bushfire Ready Neighbourhoods program aims to build resilience and capacity in bushfire preparedness by accessing existing community networks and resources and supporting communities to develop specific local initiatives. The program's preparation activities include community forums, bushfire rehearsals, women's programs and property assessments. From an agency perspective, it is important to trial innovative approaches and remain abreast of current and emergent technologies such as VGI.

Survey methods

A research questionnaire was developed and administered in 12 at-risk communities across Tasmania (Figure 1). These communities represent a relatively equal distribution across the main populated fire-risk regions.

Multiple survey distribution methods were adopted to reduce potential response bias associated with survey format (e.g. paper-based versus online) and varying lifestyle and work patterns. The lead researcher opportunistically interviewed individuals at each study community. An open access version of the survey was available online and was promoted to communities through sharing on the official TFS Facebook page, local radio, and flyers placed on community

noticeboards. In addition, questionnaires were mailed to all residential addresses (n=1075) in four targeted communities spread across each region of the state. A total of 154 complete survey responses were received and collated and analysed in Microsoft Excel and Esri software ArcGIS 10.2, with results standardised using Australian Bureau of Statistics (ABS) 2011 Census data.

Survey results

Demographics

The age distribution was uneven with approximately half of the respondents aged 51 or older (Table 1). Comparison with the ABS Census demographic profile confirms the survey dataset was broadly representative of the study communities (Table 1). Each age group was evenly represented except for a slight under-representation of the 18-25 group. An equal proportion of male (n=73) and female (n=77) respondents was recorded ('other'=2, 'did not state'=2). The majority of respondents had lived in the area and current house for more than five years.

Table 1. Sample size of each age group as a proportion of the total population of the surveyed communities based on ABS 2011 Census data.

Age	Sample Size	Total Population	Proportion (%)
18–24	6	1 003	0.60
25–34	15	1 300	1.15
35–50	46	3 318	1.39
51–70	66	4 539	1.45
71+	21	1 485	1.41
Sum	**154**	**11 771**	

Bushfire preparedness

Awareness of bushfire risk was high with almost all respondents (96 per cent) recognising they live in a bushfire-risk area, 59 per cent of respondents identifying themselves as vulnerable to bushfires. When asked if they felt responsible for preparing for bushfires, 88 per cent of respondents said yes. When proposed that it was the responsibility of local, state and/or federal agencies to prepare for bushfires, 78 per cent agreed. While 70 per cent of respondents considered themselves to be well informed about bushfire and bushfire risk and 74 per cent of respondents were familiar with the Tasmania Fire Service Bushfire Survival Plan, just 59 per cent confirmed they had a bushfire plan. Most respondents (69 per cent) had never attended a bushfire awareness event and only 37 per cent of total respondents said they intend to become more prepared in the next two years (48 per cent said 'possibly').

Social media use

Social media uptake within the study communities was high with 76 per cent of respondents using some form of social media. Social media usage varied spatially with higher rates in more populated areas (Figure 1). There was a decreasing trend in social media use as age increased (Figure 2). The platform most widely accessed among respondents was Facebook (82 per cent), followed by YouTube (53 per cent), LinkedIn (26 per cent), Twitter and Instagram (15 per cent each). Other platforms were reported but not in significant numbers. The main reasons respondents used social media (Figure 3) were to communicate with family and friends and for news and information. Of those who use social media, 51 per cent contribute their own content online and 60 per cent access social media at least once a day. The level of trust given to different online information sources varied with greatest trust given to government agencies (Figure 4).

The potential for VGI use in bushfire preparation and communication

The potential role of VGI and associated technologies, including social media, for bushfire preparation was well recognised. In this survey, 75 per cent of respondents agreed these technologies can assist to improve preparation, and 74 per cent believed they allow authorities to use local information provided by community members. But at present just 48 per cent of respondents said they would like to share and receive relevant information for bushfire preparation via social media.

Communication between community members and authorities was identified as important by 97 per cent of respondents. The results presented in Figure 5 show distinct differences in preferred communication methods before, during and after a bushfire.

Figure 1: Spatial distribution of social media usage levels in the study communities, normalised based on ABS 2011 Census data for survey populations.

Figure 2: Social media usage by age showing a decrease in usage with increase in age.
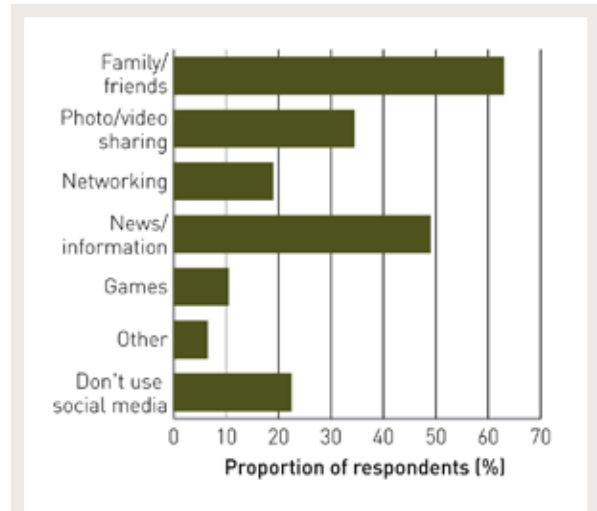
Figure 3: Motivations for social media use and the proportion of respondents for each.
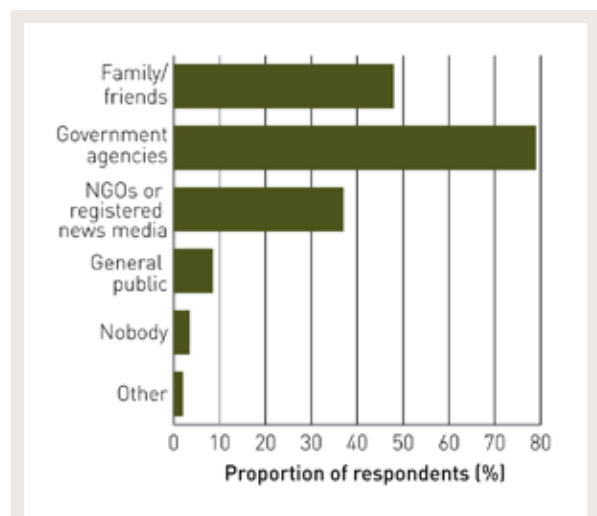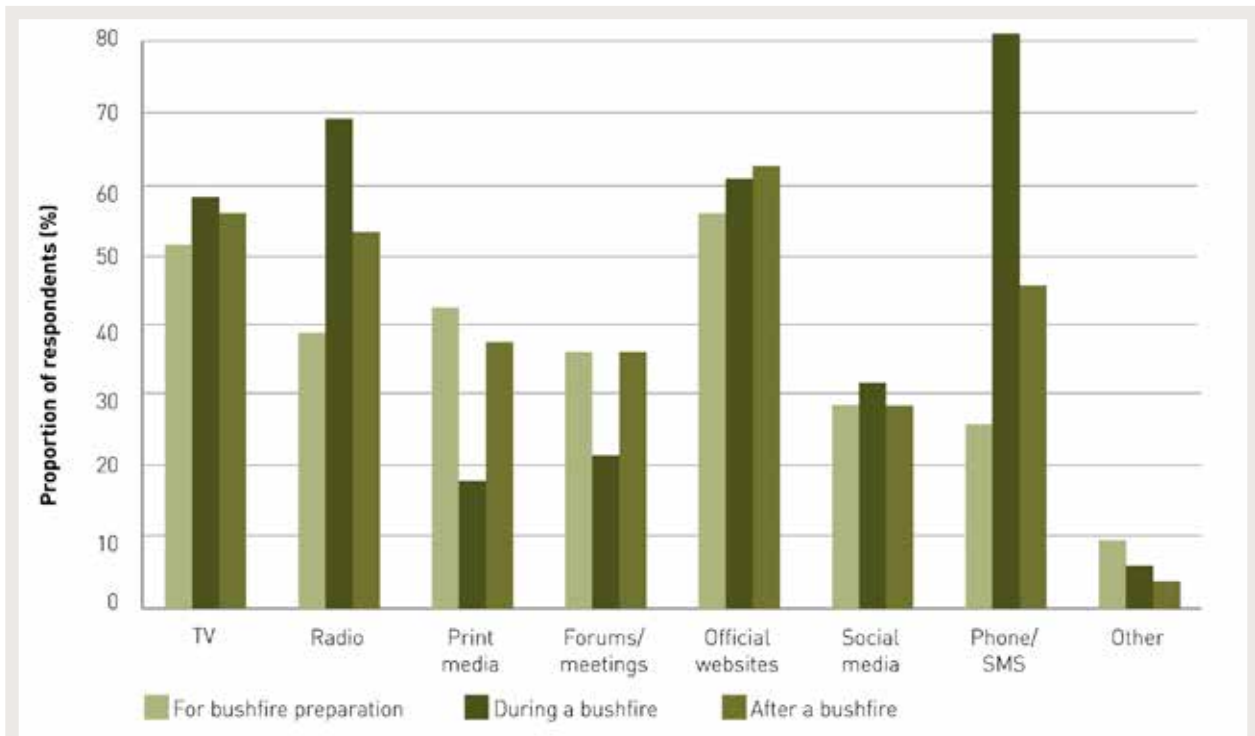

Figure 4: Levels of trust given to sources of information through social media (not specific to bushfire information).

Figure 5: Proportions of respondents preferring various communication methods for relevant information from authorities at various stages of bushfire management.

Discussion

There is a need for new approaches to engage citizens in risk reduction as shown in this evidentiary analysis. Emerging technologies that allow dynamic and interactive exchange of information may contribute to alternative engagement methods. However, the survey results highlight limitations in the use of these technologies in bushfire management from recognised issues such as the 'digital divide' to more nuanced concerns that should be considered in any initiatives to promote adoption of these technologies.

The need for new engagement methods

The awareness by respondents of bushfire risk did not necessarily translate to levels of preparedness or intentions to prepare (for similar findings see Whittaker *et al.* 2013, Eriksen & Gill 2010). Akin to the notion of shared responsibility (McLennan & Handmer 2012), respondents identified themselves as responsible for their own bushfire preparation alongside authorities. Although many respondents stated there was a bushfire risk where they lived and felt vulnerable, fewer respondents had a bushfire plan or intended to become more prepared in the future. Frandsen, Paton and Sakariassen (2011) argue that the goal of facilitating household and community bushfire preparedness cannot be achieved simply by making information on risks and hazards available to people. Sustained hazard preparation is a function of how people interpret information in social and community contexts (Frandsen, Paton & Sakariassen 2011). Thus, novel approaches for communicating bushfire preparedness information are needed; but

not only information communication from agency to citizen, but from citizen to agency and between citizens. Approaches that augment traditional processes of information dissemination and reception and facilitate collective, two-way and integrated systems of sharing local and authoritative knowledge may create a wider understanding. They may also increase connectedness and achieve greater participation in risk reduction activities that ultimately increases disaster resilience.

Potential for social media and VGI

A large portion of the surveyed community used VGI technologies. This use is not limited to reading online content but involves people contributing their own data and information on a daily basis. Many already have the skills, motivation and physical access to the technology required to use social media platforms for various tasks, including communicating with family and friends, information acquisition and sharing photos and videos (Figure 3). Respondents also recognised the potential for new tasks that use the same skillset, such as sharing local knowledge and concerns relating to bushfire preparedness with community members. This presents a potential new 'virtual landscape' for preparedness engagement, facilitating both maintenance of existing community ties and the building of new ones. By making users feel connected to a community and increasing their knowledge of other members, social media sites can foster norms of reciprocity and trust and, therefore, produce opportunities for collective action (Valenzuela, Parker & Kee 2009).

The potential use of VGI is also evident in the level of community interest. Most respondents felt social media could assist in bushfire preparation. However, less than half actually like to contribute and receive relevant preparation information with their community through social media. This disconnect between perceived relevance and intent to directly engage is unclear and suggests limitations to the use of VGI technologies and requires further research.

Limitations of social media and VGI

The survey data highlights important challenges to the use of VGI methods in bushfire preparation. The trend of decreasing social media use with increasing age (Figure 2) observed in this study is consistent across the general Australian population (see Socialbakers 2014). The use of these technologies may therefore not be applicable to all members of the community at this time and it is inappropriate to adopt a blanket approach for bushfire management across Tasmania. Research in other fields shows that strategies that use a broad-scale approach to address diverse issues and fail to account for local variation can result in ineffective management (e.g. Haworth, Bruce & Iveson 2013).

Technological factors may also limit VGI approaches resulting in further inequalities associated with remoteness. Spatial variation in the current uptake of social media (Figure 1) may reflect technology access in particular areas (poor internet and mobile phone coverage), or other factors, such as varying life situations. Communities with higher rates of social media usage tend to be in areas of higher population density (such as Launceston, St Helens and Hobart). This may reflect age distribution with higher concentrations of younger people engaged in social media living in cities for increased employment and education opportunities and higher concentrations of retirees in smaller rural towns.

Concern relating to the trust and credibility of online information was an important study finding. While communication with family and friends was most frequently given as a main reason for social media use (Figure 3), less than half of the respondents reported family and friends as a trustworthy information source on social media (Figure 4). Government agencies were cited as trustworthy by most respondents. This is an encouraging result for agencies seeking to incorporate online technologies into their management strategies. But low levels of trust of information sourced from the public may prevent some community members using VGI.

Understanding preferences in communication methods and how they differ at different stages of disaster management (Figure 5) could have important implications for the success of management strategies using a combination of communication tools. The results of this study concur with a recent study by Taylor and colleagues (2012) on community response during *Tropical Cyclone Yasi* in which respondents preferred to use a range of communication channels, including Facebook, TV news, online news and local

radio when seeking information. It is evident that although social media is popular in the community there is still a strong desire for emergency communication via traditional media. The current study showed that although social media is not the most preferred communication medium in any stage of management, those who do prefer social media are consistent in this preference before, during, and after a bushfire event.

Study limitations and future considerations

Common survey method challenges need to be recognised. Possible biases may be introduced during in-person surveys if respondents alter their responses based on what they perceive to be more socially desirable (Krosnick 1999, Fisher 1993). Question interpretation may influence survey responses (Smith 1987). Both these phenomena are relevant to questions relating to the bushfire plan, for example, resulting in higher reporting of respondents with a comprehensive plan than may actually be the case. Future studies would benefit from placing greater emphasis on explaining key terms or employing methods of data collection that increase opportunity for clarifications. While the mail-out survey distribution method yielded a higher response rate, substantial value was gained from opportunistic, in-person interviews that facilitated informative discussion and the opportunity to manage question misinterpretation.

Significantly, this study provides evidence for the potential use of VGI based on perceived need, uptake of technologies and community interest, but it does not address *how* this potential could be realised. To offer a possible example, VGI contributed by local individuals to a dynamic community map could identify areas of importance or concern, such as community assets, vulnerable people or areas, 'safer' places for evacuation, or high vegetation fuel load areas. This would provide community members with information about their surrounds and assist in planning for bushfire response. Further, spatial awareness of the activities of others may encourage individuals to mobilise and co-operate on preparation tasks that meet mutual needs. Future research should extend this work with more detailed, localised studies to examine how the potential of VGI initiatives highlighted in this paper can be effectively realised.

Conclusion

Results of the community survey demonstrate potential for VGI and associated technologies to be useful in fostering bushfire preparation, but approaches using VGI should not replace traditional methods of bushfire communication and engagement. With increasing access to and familiarity of social media and VGI in communities, it is timely to understand how they can act as a complimentary mechanism for increasing preparedness. The efficacy of these enabling technologies to facilitate greater community awareness, connectedness and collaborative action needs to be evaluated.

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Characteristics of a disaster resilient Victoria: consensus from those involved in emergency management activities

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ABSTRACT

The aim of this study was to reach a consensus among stakeholders on the characteristics that they consider relevant for developing a disaster-resilient Victoria. Key stakeholders were defined as members of organisations involved in emergency management activities in Victoria (i.e. federal, state and local government, emergency services organisations, businesses, non-government organisations, community groups and researchers). A literature review was conducted to identify an initial set of characteristics. Using the Delphi technique, three surveys were conducted to identify any additional characteristics stakeholders considered relevant. This was used to achieve consensus on which of the characteristics from the literature and additional characteristics are relevant for the Victorian context. The findings indicate that stakeholders perceive that a systemic approach, which encompasses both formal structures and grass roots efforts, is required to develop a disaster resilient Victoria. This paper reports those findings to reach a consensus among key stakeholders on the characteristics they consider relevant for developing disaster resilience in Victoria.

Introduction

The *National Strategy for Disaster Resilience* (NSDR) has guided the direction of the Australian emergency management sector since its release in February 2011 (Council of Australian Governments 2011). This is reflected by the numerous policies and projects designed to increase disaster resilience initiated at a national, jurisdictional and community level (e.g. Victorian Government 2011, 2012). Three key philosophies from the NSDR appear to underpin these:

1. a focus on 'preparation and mitigation', rather than 'response and recovery'
2. a model of emergency management based on shared responsibility between governments, business, communities and individuals, rather than the traditional top-down, chain-of-command
3. a risk management approach.

Despite this common focus, a clear articulation of the characteristics that determine whether a society is resilient in the face of an extreme event is missing in the NSDR. The NSDR identified four characteristics of disaster resilient communities, individuals and organisations:

- functioning well while under stress
- successful adaptation
- self-reliance
- social capacity (Council of Australian Governments 2011, p. 4).

The NSDR does not expand on what these characteristics imply or offer guidance on how they link to areas for action. These concepts are also ill-defined and contentious within the literature. As a result, it is not entirely clear whether Victoria or indeed Australia is currently resilient, how initiatives can be designed to ensure that required characteristics are developed, and how progress could be measured. As a starting point, a conceptual framework is required to unify efforts towards enhancing disaster resilience.

Two Australian frameworks have been proposed that describe the characteristics of a disaster resilient community (Arbon *et al.* 2012, Dufty 2011). However, they are based on the literature rather than data collected within Australia, they consider a limited range of characteristics compared to international models (e.g. Twigg 2009), and they focus narrowly on the community context. Therefore, they may be missing some characteristics central to developing resilience in Australia.

Data were collected from members of organisations involved in emergency management activities in Victoria (i.e. federal, state and local government, emergency services organisations, businesses, non-government organisations, community groups and researchers). These participants were chosen for this study, as they

were deemed likely to have first-hand knowledge of the characteristics that determine whether a society is resilient in the face of an extreme event. Achieving consensus among participants was considered important because not all stakeholders were involved in the NSDR development and a consensus-based approach reflects the NSDR's philosophy of shared responsibility. Ultimately, the research reported here will underpin a conceptual model for developing disaster resilience, particularly in Victoria.

Method

Identifying the characteristics considered relevant for developing a disaster-resilient Victoria involved a two-stage process. The study involved:

1. Conducting a literature review to identify a set of characteristics thought to determine whether a society is resilient in the face of an extreme event.

2. Asking 113 stakeholders to contribute additional characteristics they consider important to developing disaster resilience.

3. Presenting all characteristics to the 113 stakeholders using a three-round modified Delphi technique to obtain consensus on the relevance for developing disaster resilience, particularly in Victoria.

Stage 1: Literature review to identify an initial set of resilience characteristics

The aim of this stage was to identify an initial set of characteristics drawn from the literature to be important for achieving resilience. Table 1 describes the search strategy for the literature review. As there is extensive literature on disaster resilience, the review was limited to models or frameworks that describe the characteristics that contribute to disaster resilience. A thematic analysis of the models was undertaken to synthesise a common list of characteristics. This involved classifying the characteristics from each model according to themes.

Stage 2: Identify and evaluate resilience characteristics by stakeholders

The aims of this stage were to:

- identify any additional characteristics that stakeholders consider relevant

- reach consensus on which of the characteristics from the literature and additional characteristics are relevant for the Victorian context.

Monash University Human Ethics Committee approved this study.

Recruitment

Participants were recruited through the Monash University Disaster Resilience Initiative (MUDRI) Forum (July 2013), the MUDRI email list, and emails to organisations involved in emergency management activities in Victoria. Participants were asked to forward the invitation to relevant contacts.

Table 1: Criteria for literature review search strategy.

Criterion	Detail
Search terms	Disaster AND Resilience
Language	English only
Timeframe	2000 – October 2013
Databases	OVID, MEDLINE, Google Scholar, Web of Science
Inclusion criteria	Model or framework describing characteristics or factors contributing to disaster resilience. Primarily related to resilience to extreme events (manmade or natural).

Procedure

Three online surveys were conducted during July to September 2013. A modified Delphi technique (Linstone & Turoff 1975) was used to reach consensus without engaging participants in direct discussion. This involved providing feedback on the results so that participants could see whether their views aligned with others and change their opinions if desired. Consensus was said to exist when at least 75 per cent of participants agreed. Although conservative, this consensus criterion was selected to represent a close to unanimous view (e.g. Keeney, Hasson & McKenna 2006).

In Survey 1 participants rated whether the characteristics identified from the literature review were relevant to developing disaster resilience in Victoria on a five-point scale (1 = 'Not relevant at all', 5 = 'Extremely relevant'), and asked to nominate additional characteristics they consider relevant.

In Survey 2 participants were presented with the results of Survey 1 and asked to re-evaluate the characteristics that did not reach consensus using two options ('Relevant' or 'Not relevant'). They also rated the relevance of the additional characteristics identified from Survey 1 on a five-point scale (1 = 'Not relevant at all', 5 = 'Extremely relevant').

Participants who did not respond to Survey 2 were not invited to participate in Survey 3. In Survey 3, participants were presented with the results of Survey 2. They then re-evaluated the additional characteristics that did not reach consensus using two options ('Relevant' or 'Not relevant').

Results

Stage 1: Literature review

The search identified 766 articles. Based on the search criteria (see Table 1), 13 models of resilience were identified. The characteristics identified through the thematic analysis, and their sources are presented in Table 2.

Table 2: Characteristics of disaster resilience identified from the literature.

Characteristic	Sources												
	Bruneau et al. 2003	Mayunga 2007	Twigg 2007, 2009	Norris et al. 2008	Stewart, Kolluru, & Smith 2009	Chen & Wang 2010	Longstaff et al. 2010	Renschler et al. 2010a	Dufty 2011	Ainuddin & Routray 2012	O'Sullivan et al. 2012	Arbon et al. 2012	International Federation of Red Cross and Red Crescent Societies 2012
Natural environment/ecosystem		Y	Y				Y	Y	Y				
Land use and management			Y						Y				Y
Built environment (e.g. buildings, roads)	Y	Y	Y					Y	Y	Y			Y
Critical infrastructure (e.g. water, power, public health, transport)	Y	Y	Y		Y		Y	Y	Y				Y
Supply chain (i.e. food and fuel supplies)					Y		Y						Y
Co-operation connectedness, co-operation and support systems (e.g. community-based volunteer organisations)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Community economy (i.e. financial capital, employment)	Y	Y	Y	Y	Y	Y		Y	Y	Y			Y
Knowledge and skills of the community		Y	Y		Y			Y	Y		Y		Y
Community adaptation (i.e. the capacity of the community to improvise and response to event through social learning)							Y				Y	Y	
Population characteristics (e.g. health, wellbeing, age)			Y				Y				Y	Y	Y
Co-ordinated resources for emergency response	Y	Y				Y	Y	Y	Y	Y	Y	Y	
The rapidity of the initial response	Y	Y							Y				
Public warning systems for extreme events		Y	Y						Y				
Prevention and mitigation activities	Y	Y					Y	Y	Y			Y	
Emergency management planning and procedures		Y						Y	Y			Y	
Partnerships between sectors			Y	Y	Y								Y
Clear responsibilities		Y											
Ongoing research and learning systems		Y											Y
Hazard and risk assessments		Y									Y	Y	Y
Availability of valid and appropriate risk assessment tools		Y											
Government policies, priorities and political commitment		Y											
Legal and regulatory systems		Y				Y	Y	Y					

Stage 2: Identify and evaluate characteristics by stakeholders

Participants

Table 3 provides background information on the participants in the three surveys. There was a 14 per cent attrition rate at Survey 2 and an 18 per cent attrition rate at Survey 3.

Ratings of characteristics from the literature

Table 2 presents the complete list of characteristics from the literature. In Survey 1 there was consensus (defined as ≥ 75 per cent agreement, n = 84) that partnerships between sectors (82 per cent agreement), community connectedness, co-operation and support systems (81 per cent agreement), and critical infrastructure (80 per cent agreement) are 'extremely relevant'. No consensus was reached on the remaining characteristics. In Survey 2 there was consensus (defined as ≥ 75 per cent agreement, n = 76) that all characteristics except 'legal and regulatory systems' are 'Relevant'.

Additional characteristics suggested by participants

Table 4 presents the complete list of 27 additional characteristics participants suggested in Survey 1.

Table 3: Participant characteristics.

Characteristic		Survey 1 (n = 113)	Survey 2 (n = 97)	Survey 3 (n = 79)
Roles	Federal government	6	2	2
	State government	32	28	21
	Local government	14	10	8
	Emergency services	19	19	15
	Business	7	6	5
	Non-government organisation	17	15	13
	Community group	9	9	8
	Research group	9	8	7
Demographics	Gender Female	53*	51	41
	Male	59*	46	38
	Age (Mean years, SD**)	49.7, 9.7	49.3, 9.6	48.94, 11.1
	Experience (Mean years, SD)	13, 11.50	12.8, 10.7	13.9, 11.8

* 1 missing. **Standard Deviation.

Ratings of additional characteristics

No consensus was reached regarding any of the additional characteristics in Survey 2. In Survey 3 there was consensus (defined as ≥ 75 per cent agreement, n = 59) that 23 of the 27 characteristics are 'Relevant' (see Table 4).

Discussion

The aim of this study was to seek consensus from stakeholders regarding the characteristics they consider relevant for developing disaster resilience, particularly in Victoria. In order to identify a comprehensive set of characteristics, participants were asked to evaluate characteristics from the academic literature and suggest additional characteristics they felt were relevant to Victoria. In total, 46 characteristics were agreed as 'Extremely relevant' or 'Relevant' for the Victorian context.

The endorsement of so many characteristics reflects the complex nature of the question that participants were asked to consider: 'What characteristics are relevant to developing a disaster resilient Victoria?' The responses indicate that a systems approach is required. This recognises that enhancing resilience involves multiple stakeholders and activities across the socio-ecological system. While this view is prevalent and well established within the academic literature (e.g. Béné *et al.* 2012), this study provided a unique opportunity for practitioners to potentially have input into the direction of the approach in Victoria, and to inform future policy developments.

From this perspective, all characteristics agreed as 'Extremely relevant' or 'Relevant' should be considered critical for developing disaster resilience

in Victoria. These characteristics can be interpreted as representing the 'disaster resilience system' in Victoria, encompassing the environmental context, individuals and communities, businesses, agencies and the all levels of government. The findings show that stakeholders perceived that to enhance resilience, all stakeholders within the system need to be engaged and connected. This view is exemplified by the three characteristics agreed as 'Extremely relevant':

- partnerships between sectors
- community connectedness, co-operation and support systems
- critical infrastructure.

Taken together, these characteristics reflect the need for co-ordinated and reliable top-down resources to support efforts at the community level. The characteristics identified as 'Relevant' further reinforce this view and provides further specification of the actions required to achieve this goal.

Many of the additional characteristics suggested by participants highlight the importance of interactions between stakeholders within the system. For example, the characteristics 'flexible government systems that can accommodate community innovation and responsiveness' and 'ability of the emergency services to accommodate communities' spontaneous response to extreme events' require interactions between local communities, agencies and government. Surprisingly, this perspective was largely missing from the characteristics identified from the literature review. This highlights the unique contribution that practitioners bring to understanding resilience, which could benefit both academic and policy discourse.

The Emergency Management Victoria *Interim Emergency Management Strategic Action Plan* (2014/15) provides an opportunity to evaluate whether the characteristics participants identified as 'Relevant' are reflected in strategic policy in Victoria. The plan identifies specific actions that strengthen Victoria's emergency management capability, including the need for:

- a common risk assessment tool and the conduct of state-wide risk assessments
- local emergency management plans
- increased capacity for communication to/from the community
- infrastructure that supports an all-hazards, all agencies approach to response and recovery that is sustained through volunteer recruitment and training.

These actions align with characteristics agreed as 'Relevant' by stakeholders. However, actions to enhance community engagement and development, both important components of many of the characteristics identified in this study, are clearly missing from the plan. Moreover, although the plan goes some way towards building a solid 'top-down' structure, no actions are specifically identified to support business,

Table 4: Additional characteristics suggested by participants in Survey 1, with ratings from Survey 3 (as a % of sample in Survey 3).

Characteristic	Not relevant	Relevant
Multiple modes for communicating relevant information to the community, not necessarily reliant on technology	2.6	97.4
Flexible government systems that can accommodate community innovation and responsiveness	2.6	97.4
Consideration and inclusion of local community groups during response and recovery efforts	2.6	97.4
Effective and inclusive community engagement (i.e. participatory decision making processes) incorporated into planning and prevention activities	5.1	94.9
Emergency planning at the household level (e.g. insurance, evacuation plans)	5.1	94.9
Community members that are empowered to make decisions and take action	6.4	93.6
Awareness of vulnerable community members	6.4	93.6
Adoption of an all-hazards, all-agencies approach	6.4	93.6
Psychological resources/support for community members post-disaster	6.4	93.6
Consideration of local infrastructure during response and recovery efforts	6.4	93.6
Positive and highly trained leaders at all levels of the emergency/disaster management system	9	91
Effective community education regarding preparation	9	91
Effective community education regarding prevention/mitigation	10.3	89.7
Effective communication about local resilience/disaster planning activities	10.4	89.6
Adoption of innovative approaches to emergency/disaster management	11.5	88.5
Financial funding for Emergency Services	12.8	87.2
Ability of the emergency services to accommodate communities spontaneous response to extreme events	12.8	87.2
Effective community education regarding response	14.1	85.9
Effective community education regarding recovery	14.1	85.9
Communities that build and maintain a collective memory of previous disaster impacts	14.1	85.9
Communities that are motivated and committed to the resilience approach	19.2	80.8
Adoption of new and relevant technologies	20.5	79.5
Education system	23.1	76.9
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Media	25.6	74.4
Community disaster resilience committees	26.9	73.1
Gender balanced decision making at all levels of the disaster/emergency management system	39.7	60.3
Single agency coordinating the resilience based approach	51.9	48.1

----- represents the cutoff point for consensus of 75 per cent

community or individual efforts. However, it is stated that 'work will continue…. on building community resilience' alongside the actions identified within the plan (Emergency Management Victoria 2014, p. 4). The findings from the current study could potentially be used as an overarching framework to direct this work.

Overall, the findings suggest that the scope of emergency management reform in Victoria needs to be extended. There is already recognition that a whole-of-government approach is required that encompasses mitigation, preparedness, response and recovery, and supports interactions between agencies (Emergency Management Victoria 2014). The findings suggest that reform also needs to specifically address the role of businesses, communities and individuals in enhancing resilience, as well as the interactions between actors at all levels in the system.

The findings also provide evidence that stakeholders broadly support the approach outlined in the NSDR. Most characteristics agreed as 'Extremely relevant' and 'Relevant' reflect themes within the NSDR including:

- the built and natural environment

- the responsibilities of the business sector

- the characteristics and capacity of the local community

- emergency response capabilities

- knowledge about potential hazards, risk factors and the local context

- community education about prevention, preparedness, response and recovery (PPRR)

- government systems

- financial resources.

While critical infrastructure is not specifically addressed in the NSDR, it is reflected in a companion federal government strategy, i.e. *Critical Infrastructure Resilience Strategy 2010*. Overall, these findings suggest that stakeholders accept the NSDR.

This study had some important limitations that should be acknowledged. Firstly, the results should not be generalised outside the Victorian context without further research. Secondly, a convenience sample was used, as they were all contacted through MUDRI

forums or other contacts within Victoria. However, this is balanced by the cross-section of ages, roles and levels of experience represented.

Finally, the study points to directions for future research. This study identified the characteristics that stakeholders agreed are relevant for developing a disaster resilient Victoria. Research is required to identify where each characteristic sits within the 'disaster resilience system' (e.g. at the community level, at the state or local government level), and which stakeholders are responsible for, or may influence, development of the characteristics. Following on from this, stakeholders will need to set priorities in terms of which characteristics require immediate action within Victoria. These activities will provide a clear action plan which details what characteristics are required to enhance resilience and which stakeholders should be working together to attain them.

Conclusion

This study moves towards closing the longstanding theory, policy and practice gap in the discourse around disaster resilience. It demonstrates that stakeholders perceive that a systemic approach, which encompasses both formal structures and grass roots efforts, is required to develop a disaster resilient Victoria.

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How a change in thinking might change the inevitability in disasters

By Mark Crosweller AFSM, Director General, Emergency Management Australia

INTRODUCTION

It is not possible to solve a catastrophe, nor is it possible to avoid natural disaster events that produce them. But it is possible for us to better prepare for, respond to and recover from them, and to reduce their individual and collective impact.

The purpose of this paper is to explain why we should approach catastrophic disasters more comprehensively; not from the perspective of spending significant amounts of extra time, money and resources to mitigate their effects, but to approach the problem differently by changing the way we think about them.

Conceptualising the environment of natural disasters

Australia's ability to reduce the risks associated with natural hazards has improved immeasurably over the past 100 years. As our regional populations have increased, so too our economies have grown, our technology advanced and our knowledge base increased. This has enabled us to increase our risk treatment effectiveness from low/moderate events at the beginning of the 20th Century through to severe events in 2015.

As our capability to treat risks has increased, the consequences of impact (loss of life, economic, social, built and natural impacts) have decreased. We do, however, reach a point where the effectiveness of our capability reaches its limit and the intensity of the event surpasses that capability and produces a significant and unacceptable consequence.

In the past 12 years we have seen our capacity tested by the 2003 Canberra bushfires, the 2009 Victorian bushfires, the 2010-11 Queensland floods (including *Cyclone Yasi*), the 2011 Victorian floods, the 2012 Perth Hills bushfires, the 2013 Tasmanian and Blue Mountains bushfires and the 2013 ex-tropical *Cyclone Oswald* in Queensland; all severe to catastrophic events. It's time to change our thinking.

In order to consider severe to catastrophic disasters more fully, there is a need to conceptualise them by explaining the correlation between risk, consequence and intensity. Figure 1 explains this correlation.

(A) Level of consequence

The level of consequence arising from any given hazard can be broken into two elements: the 'potential' and the 'actual' consequence.

Potential consequence explains what would otherwise occur if a risk treatment action was not effectively implemented to mitigate the potential effects of a hazard. For example, if a bushfire started and there was no response from fire services, no previous hazard reduction carried out, no understanding by the community of the fire's potential, and no action by any individual to prepare for such a fire, then the full potential damage of that hazard would be realised.

Actual consequence explains what actually happened despite all that was done to mitigate the potential effects. Actual consequence is another way of describing what results from 'residual risk' – that is to say, the portion of a hazard's effects that could not be effectively treated.

(B) Intensity of event

The way a hazard's intensity is measured depends on its nature. For example, riverine flooding is measured as minor, moderate and major. Bushfires are measured as low/moderate, high, very high, severe, extreme and catastrophic. Cyclones are measured and rated between categories one to five. Currently, there is no single way in which to correlate intensity across all natural hazards. This fact notwithstanding (for the purpose of gauging where we appear to reach the limitation of our risk treatment effectiveness) the Fire Danger Rating Scale of low/moderate, high, very high, severe, extreme and catastrophic may be loosely correlated against all natural hazards.

(C) Risk treatment effectiveness

In simple terms, risk treatment effectiveness is our ability to ameliorate, mitigate, or if possible, negate the potential risk to life, property or the environment. Of course, we must keep in mind that not all risks can be
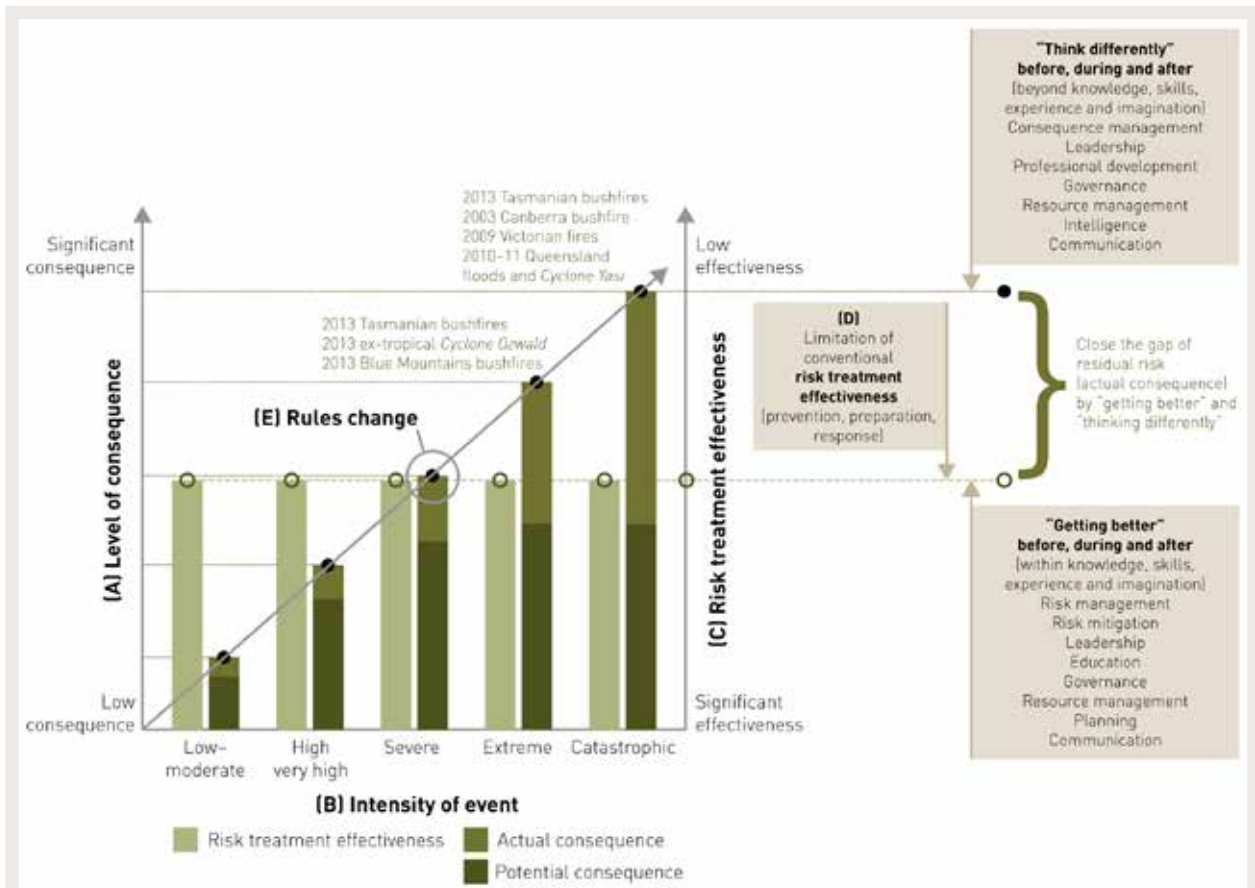
Figure 1: Correlation between risk, consequence and intensity.

negated as, for nearly all hazards, a level of residual risk remains.

Risk treatment effectiveness is achieved by undertaking risk treatment actions. These actions include the following as examples:

- land use planning and development controls
- emergency management planning
- construction standards
- community awareness, education and engagement
- landscape modification (flood levee banks/prescribed burning/hazard reduction)
- response resources (police/fire/ambulance/state emergency services)
- research and education
- communication
- intelligence.

Implementing these risk treatment actions reduces consequence; however the extent largely depends on their effectiveness individually and collectively enacted against a potential hazard's intensity.

(D) Limitation of risk treatment effectiveness

As effective as they are at mitigating risk, all risk treatment actions have limitations to their effectiveness. Examples include:

- Flood levies of eight metres work for floods up to that level, but fail during floods peaking at 8.2 metres.
- Bushfire hazard reduction awareness is at its most effective the day after mitigating actions (clearing fuel for example), however effectiveness progressively deteriorates thereafter.
- Understanding national construction standards does not always account for regional environments and hazard-influenced weather anomalies. For example, application of the Wind Code[1] works for buildings to withstand a wind load impact up to the point of maximum wind strength as identified for a region within the Code. But the Code does not account for cyclonic winds in NSW or Victoria because they do not occur in these regions of Australia. However, cyclonic-strength winds are produced by pyrocumulonimbus cloud formations that arise out of catastrophic fire conditions as evidenced in Canberra in 2003 and Victoria in 2009.

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1   Australian Standard: Wind loads for housing AS: 4055–2012. At: www.standards.org.au/OurOrganisation/News/Pages/Wind-loads-for-housing.aspx.

- Response resources such as fire appliances and fire-bombing aircraft can suppress and extinguish fires up to certain intensities, but at the severe to catastrophic level they are generally unable to enter fire grounds due to the extreme danger and, therefore, there is little if any effect on the fire's intensity, direction or rate of spread.

- Emergency workers and managers develop significant knowledge, skills and experience over many years by attending and managing many lesser intensity events. Since severe to catastrophic events produce effects that not only exceed all of that knowledge, skills and experience attained over many years but also exceed the imagination of people involved, they are often stranded without readily accessible alternatives to manage such complexity.

In essence, all risk treatment actions have an individual and collective limitation to their effectiveness, which results in residual risk. This residual risk becomes realised as actual consequence when an event occurs and, in addition, it exposes the 'point of limitation' of our capacity and capability to mitigate effectively.

(E) Rules change

When actual consequence far exceeds the limits of risk treatment effectiveness the rules change. That is, the point at which those things that work for lesser intense events (i.e. risk treatment actions) no longer work for the more intense events. This results in a significant increase in actual consequence suggesting that the problems arising from these scenarios and their solutions must be managed differently. A fundamental change in our mental experience also occurs at this threshold.

Within 'knowledge, skills, experience and imagination'

Knowledge, skills, experience and imagination is a way of describing some important internal resources of our minds that we rely on to manage disasters. In essence, knowledge comes to us through learning, skills through acquiring, experience by participating or being in action, and imagination by bringing forward in our minds things not present to our senses. We rely on these and other attributes every day in every circumstance that presents before us. For the purposes of this discussion, we could call it part of our 'internal capability', noting that there are many other attributes of our minds that would also apply.

Generally speaking, our collective knowledge, skills, experience and imagination is well equipped for low to very high intensity events. Of these events, this is to say that:

- due to their relative high frequency and relative moderate complexity, scientific and industry-based knowledge is well understood about their causes and effects. We have extant skills to manage them with a reasonable efficacy (wide array of knowledge and skills)

- they are, at any location, reasonably common events and most of us with experience have been through at least one (reasonable experience)

- they produce effects that are reasonably evident and foreseeable with little, if any, downstream consequences (within imagination).

Beyond 'knowledge, skills, experience and imagination'

When the rules change our capability rapidly loses its effectiveness and our experience changes as well. Severe to catastrophic events go beyond most people's knowledge, skills, experience and imagination of these events. This is to say that:

- due to their rarity and complexity, scientific and industry-based knowledge is limited about their more complex causes and effects and therefore we lack the necessary skills to manage them effectively (lack of knowledge and skills)

- they are, at any point on the landscape, very rare events and therefore most of us have never actually been through one before (lack of experience)

- they tend to produce effects or consequences, particularly downstream consequences, that are not evident at the lower scale of events and appear very difficult to foresee (beyond imagination).

The distinction between 'within' and 'beyond' knowledge, skills, experience and imagination is critical to understand. Where we hit the limits of our current thinking is the starting point for developing initiatives to help us progress beyond those barriers.

Closing the gap of residual risk by 'getting better' and 'thinking differently'

To close the gap in residual risk, there are two principles worth considering; 'getting better' and 'thinking differently'.

Getting better

A philosophy of 'getting better' prescribes to maintaining and improving capabilities that have been developed by engaging with events within our knowledge, skills, experiences and imagination over many years.

Substantial financial investment (in the billions of dollars), time, effort, experience (often bitter), resources, research, education and sheer determination has been worthwhile and should continue. By constantly applying effort to increase our risk treatment effectiveness, we reduce the potential consequence and, by extension, the result is a diminished actual consequence.

Getting better at mitigating and managing frequent events is highly beneficial to society economically, physically and mentally. As the causes and conditions

that produce these events evolve and change (such as changes in climate, land use, societal attitudes, and values and socio-economic status), so too must our treatments adapt to new conditions. Here, the application of imagination, creativity and innovation plays an important role in improving capability over time and needs to be encouraged.

From a risk perspective, low to very high risk events are certainly much more common than severe to catastrophic ones. As a result, if not individually then certainly collectively, we have developed considerable knowledge, skills and experience about them and our capability development has been very much aligned to substantially mitigate the potential consequences of these more frequent and better understood events.

In addition, most low to very high risk events align with our expectation. That is, to a reasonable degree they align with how we would imagine them to be. This does not make them any more pleasurable to experience, but does allow us to prepare for, respond to, and recover from them quite effectively. Relative to the rarer but more severe events, we are not forced to stretch our thinking too far to achieve success.

'Getting better' is a very broad philosophy and could easily be applied to just about any aspect of emergency management. There are, however, certain 'lenses' we can look through to focus our efforts. These lenses are usually identified by the themes arising from major inquiries and commissions. Inquiries seek to find out what actually happened and recommend changes to minimise either the event itself or the impact of a similar future event. Lenses also come into view after sustained research, a lessons-identified process, and shared community experiences via theatre, music, poetry and other artistic examples.

The *National Strategy for Disaster Resilience* and its various strategic elements is also critical in ensuring that we collectively 'get better' in a range of ways underpinned by best practice in risk management.

'Getting better' is an important philosophical principle that requires ongoing investments of time, funding, resources and effort. This ensures collective operational gains made over many years through our collective 'knowledge, skills, experience and imagination' of the many events of lesser intensity and occasional events of high intensity are not lost or lessened. To do so would subsequently increase the actual consequence of disaster events.

Thinking differently

The philosophy of 'thinking differently' develops our ability to advance our present knowledge, skill, experience and imagination. This is a much more challenging space to contemplate than simply getting better. Going beyond our limits therefore is effectively a new frontier that requires sustained commitment and courage.

There is no singular approach to this challenge. There are many imaginative, creative and innovative ways of thinking differently. The following suggestions are ways

of enacting this philosophy of thinking differently. To perceive and manage severe to catastrophic disasters, we need to:

- understand and accept the inevitability of natural disasters

- change the way we think about residual risk

- implement practical measures

- establish an ethical premise for leadership.

Understanding and accepting the inevitability of natural disasters

Changing how we think about these events must start with our accepting, as a principle, their inevitability. Any community in Australia will have a natural hazard profile evidenced by history, observation and science. This data tells us that a range of events has occurred, that they are happening now, and that they will occur again.

All natural disaster events are a result of immense climatic or geological energies involving earth, wind, fire and water, none of which we have absolute control over. All are produced from highly complex natural systems and interactions between the climate, its resultant weather, the landscape, the manner in which we use the land, and the minds that we bring to these events before, during and after.

While the frequencies and intensities of these events vary considerably, all events are part of a continuum within our environment. Predicting when they'll reach a maximum potential remains an unknown, but averages of 50, 100 or even 10 000 years are frequently proffered. Nonetheless, at some point in the future when the right causes and conditions arise, major events will manifest, and when they do, we will have no choice but to confront them.

Antecedent conditions leading up to these events are, broadly speaking, overt. That is, there is little surprise in their arrival but considerable complexity in their resultant effects. Climate outlooks, weather forecasts, landscape conditions, land use, and presenting conditions all tell us what is broadly about to happen. How this information translates into impact and consequence minutiae (immediate and downstream) is hard to foreshadow, but not impossible.

Simply put, these events are inevitable (varying frequencies and intensities over time and varying impacts), beyond our ability to choose them, reasonably foreseeable in broad terms, infinitely complex and unpredictable in specific terms. While we are unable to choose them, we do get choice in how we prepare for, respond to, and recover from them.

Shifting our thinking to accept inevitability simplifies our approach to the problem. We no longer need to weigh up whether we *think* a severe event will happen or not. We accept that it will at a time not of our choosing, and we avail ourselves the opportunity to rethink how we will prepare well before they occur.

We have the opportunity to look at the whole problem, not just the more *likely* problem. Then, methodically, we may work through how to find appropriate solutions. We must open a philosophical doorway to rationally and reasonably consider what an event might look like and to properly consider not only what we might do when it occurs, but what we might do differently; or perhaps more importantly, we might choose to do nothing at all.

Changing the way we think about residual risk

To do this we identify the hazards, contemplate both the likelihood of their manifestation and the consequence of the effects, then decide how best to allocate limited and competing resources. This process is influenced by our ability to reasonably prevent, mitigate or ameliorate their effects—economically, socially, politically, technologically, legally and environmentally.

It is eminently sensible to balance what is reasonably likely to occur, how much we are prepared to invest (money, time, resources, effort) and what level of residual consequence we are prepared to accept, *provided that* residual risks are properly understood.

A problem that arises is that we tend to trade off in our minds any serious contemplation that severe to catastrophic events will *actually* occur, given their rarity. We also tend to develop false optimism; that if we implement all of the identified risk treatments for a particular hazard we will be okay. This is a reasonable assumption for low risk events, but for severe to catastrophic events, this is rarely true.

In other words, by focusing most of our effort on risk treatments and the resultant benefits, we often do not turn our minds to sufficiently acknowledge residual risk. It is the residual risk resulting from a severe to catastrophic event that causes the greatest consequence to society.

Viewing severe to catastrophic disasters as the *least* likely but *most* consequential establishes a paradox:

> 'Least likely' implies not needing to spend too much time thinking about the problem.' Most consequential' implies the exact opposite.

Closing the gap in residual risk is not intended to be a push for more funding, resources or a re-prioritisation of public policy objectives. As previously stated, risk management frameworks should identify a threshold of risk treatment actions that reduce risk to an acceptable level versus over-commitment to a rare event at the expense of unrelated risks with a high-priority community need.

For example, within the *National Emergency Risk Assessment Guidelines*[2], an event that has potential for catastrophic consequence and a likelihood (frequency)

ranging from rare (between 101 to 1 000 years), very rare (between 1 001 and 10 000 years), or extremely rare (once per 100 000 years) produces a risk rating of high, not extreme. While the severity of consequence is important, the likelihood of an event is equally important in applying levels of risk, determining extent to which those risks can be mitigated and, in this particular case, how the event's rarity both reduces risk and influences our response.

Providing that the residual risk is properly understood and considered, a reiteration that this sensible approach—decision-making based on limited resources and community priorities—is warranted; no fundamental need to alter the course is required.

However, we must remember that frequency has no bearing on the intensity of an event or its potential consequence. Potential consequence is unaffected by rarity. When an event manifests its potential impact on society will necessarily have both immediate and downstream consequences.

Therefore, reduction of risk potential for any given hazard from, say, extreme down to high on the basis of likelihood rather than a reduction in consequence magnitude (not possible, as this input is driven by nature), makes good sense providing that the residual risk is properly understood in terms of:

- its potential consequence (immediate and downstream)
- the limitations of existing risk treatment actions against potential consequence
- the gaps in capability that arise from those limitations
- the manner in which a community will manage immediate and downstream consequences when the event occurs.

Implementing practical measures

To better understand residual risk we must develop methodologies to guide people through the immeasurable complexities that severe to catastrophic disasters produce. These methods should be enacted well before an event's arrival in a sensible, planned, systematic and rational manner to identify gaps in capability and how they can be closed.

One way to achieve this is to consider a simple four-step process that helps determine what residual risk could look like and how it might be managed effectively. The steps are (principally and metaphorically):

- paint the picture
- tell the story
- find the problems
- propose the solutions.

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2   National Emergency Risk Assessment Guidelines. At: www.em.gov.au/Publications/Program%20publications/Pages/NationalEmergencyRiskAssessmentGuidelines.aspx.

Paint the picture

Paint the picture is a metaphor for a process that:

- implements principles of risk management in accordance with ISO 31000:2009 (or similar) to:

  - look at the historic hazards and the resultant disasters in a community to understand what has happened previously (including long term, rare, very rare and extremely rare)

  - look at the current potentiality of those hazards and risks

  - look at the future potentiality of those hazards and risks (what is science saying about the hazard and its risk potential in the future?)

  - look at how the landscape is currently being used and what is planned for the future

  - apply data from historical events, modify it based on current science, and overlay them onto present and planned land-use

  - prescribes risk treatment actions to override the potential consequences of the identified risks

  - ascertains an agreed residual risk profile informed by risk treatment actions

- applies appropriate modelling to the treated and residual risk profile based upon a severe to catastrophic hazard intensity that can be evidenced in history and/or science

- produces an image (static or dynamic) that indicates what an event may look like if it occurred now or in the near future.

The intent of this picture is not to foresee every minute detail and complexity of what an event may produce. Rather, it is about establishing a point of analysis in spatial form well ahead of the event, and what key challenges—strategic, operational, tactical, political, social, technological, economic, legal and environmental—can be gleaned from it.

A similar process is typically done by operational planners as an event occurs. The problems with this are many and include inadequate situational awareness to inform strategy, time to consider the potential impact and develop ameliorating tactics is scarce, and even fewer hours remain to engage contingencies, use existing capabilities differently or concurrently develop new capability to stave effects of severe to catastrophic disasters.

Tell the story

Tell the story is a metaphor for describing how the potential event may affect a community. Given the intensity of a severe to catastrophic event (and complexity of its consequence) having the ability to methodically 'step through' an event as it unfolds with sufficient time and expertise becomes critical. Being able to describe how an event could affect a community facilitates a deeper understanding of its nature, its potential immediate consequence, how it could trigger downstream consequence, and what the potential extent of damage and impact might be. Using 'narrative techniques' to explain what might happen as the event unfolds is a very powerful way to 'tell the story'.

Find the problems

Having painted a picture and told the story of a potential event, the next logical step is to ascertain what challenges such circumstances may present. Find the problems is a metaphor for teasing out all points where conventional or existing capability hits its limitation. This includes limitations of risk treatment actions, effectiveness of response and recovery resources, and our collective knowledge, skills, experiences and imagination. Gaps begin to emerge when testing existing capability against the scenario.

Find the problems also identifies the social, economic, built and environmental vulnerabilities that exist within the residual risk attributed to a severe to catastrophic event that would not otherwise be exposed through the normal risk management process.

Propose the solutions

Propose the solution is about developing creative and innovative solutions to address identified gaps from the problems found. Considerations here include:

- using existing capabilities differently, more astutely and in response to the intensity of the hazard to achieve greater effectiveness and a more satisfactory outcome (minimised loss of life and property, and as little damage to the environment as possible)

- accessing wider community capabilities that may not be evident or required during events of less intensity

- developing new capabilities that meaningfully contribute to the full range of hazard intensities (low – catastrophic)

- changing or re-ordering strategic, operational and/ or tactical priorities, including making decisions about what not to do as well as what to do

- reviewing and, where necessary, reshaping, public policy and community priorities (land use, funding allocation, and building design are examples) in a sensible way that respects the full potentiality of the hazard profile.

This process also creates an opportunity to design how we might recover—socially, economically, environmentally and physically (built environment)—prior to a severe to catastrophic event taking place. For example, by anticipating impact and consequence through a built environment lens we are afforded the opportunity to consider how best to either replace, relocate or redesign critical infrastructure, land use and public assets.

Considering these factors before an event occurs enables us to incorporate relevant decisions into asset management plans, town planning and construction standards/methods into our thinking. We're also able to build in additional mitigation measures that existing

infrastructure is incapable of incorporating due to cost, design or location constraints.

Significant work based upon this process is being undertaken in the United States, particularly the city of Seattle in Washington State and the city of Anchorage in Alaska, where they are modelling the impacts of maximum historical earthquakes against today's societies.

The city of Anchorage experienced a magnitude 9.2 earthquake in 1964 that shook for nearly five minutes. The impact was devastating then, and with 50 years of further land-use development, increases in population, greater reliance on technology, and substantially more infrastructure, not only are the potential consequences even more catastrophic, but the problems that arise in managing those consequences are significantly beyond the 'knowledge, skills, experience and imagination' of all concerned.

By trying to envisage such an event in a timely and methodical manner, they are making a significant contribution to 'closing the gap of residual risk' that will definitely change the outcome for the better.

Establishing an ethical premise for leadership

> *Thinking differently requires leadership. It also requires leadership to think differently.*

This may sound like another paradox (least likely—less thinking/most consequential—more thinking) but the distinction is important. Developing leadership competencies addressed in the more traditional disciplines is critical, yet leaders will require further vision. They will need to rely on an ethical basis in which to provide stewardship to those they are leading through the complex analysis of severe to catastrophic disasters, both ahead of time and when they occur.

Disasters are about people. They are also, of course, about things—roads, bridges, buildings, power, water—but only to an extent that damage to those things physically, mentally and emotionally affects people. Of these, how people 'feel' is as important to surviving disaster as what they 'think'. That is, disasters are more often a matter of the heart than the head.

An ethical premise must underpin a leader's thinking to respond to this reality. The purpose is not to judge others or to see ourselves as better, but rather to connect with the people who we will be called on to lead. If we judge ourselves as better than others we will achieve the exact opposite of the required connection. Instead, we will isolate and offend.

We must establish a way to secure the trust and confidence of those we call to lead and protect, to unify them, to bring out the best in their collective 'knowledge, skills, experiences and imagination', to acknowledge the physical, mental and emotional impact on them, and to encourage them to replace

blame with learning and reflection. To achieve this, the following ethical principles may assist in establishing this premise:

Establish and maintain trust and confidence

Leaders must establish and maintain the trust and confidence of those they are called on to lead before, during and after severe to catastrophic events. We need to maintain our integrity at all times, ensuring our words and actions align. We need sufficient humility to acknowledge when we are wrong or have wronged others and to forgive ourselves or seek forgiveness from others. We need to exercise the courage to speak truthfully about a matter regardless of cost to our egos. Our thoughts, words and actions must be for the benefit of others. Our agendas, clear, unambiguous and open for all to see. Exhibiting exemplary behaviour is critical.

Our sense of self and ability to be a well-balanced, compassionate human beings must never be sidelined. We need to be accountable for our past, present and future results and we should use, to the fullest (and constantly improve) all of our inherent talents. The Australian community expects this and we should expect nothing less of ourselves.

Unite in the face of adversity

Natural disasters force collective action in a society to deal with effects. Not only are severe to catastrophic events inevitable, they are immeasurably complex in their science (their causes), behaviour (what they do), and their impacts (who and what they effect and how). We must humbly accept that they exceed our collective capabilities to mitigate them effectively.

It is only by engaging our collective physical resources, knowledge, skills, experience, creativity and innovation before, during and after an inevitable event that solutions to complex natural disasters form. Acknowledging this underpins our need for unity.

Exercise humility

Having the capacity to accept the inevitability and complexity of severe to catastrophic events, our individual and collective limitations externally and internally in dealing with them, and the need to unify in the face of such adversity requires all of us to exercise humility before, during and after a disaster.

Humility allows us to surrender our fixed views of the world, and presents opportunities to expand our thinking, to genuinely hear the contributions and suggestions made by others, and grant ourselves permission to say 'we don't know, but we'll find out'. Perhaps most importantly, humility shows a genuine vulnerability; one that fosters personal relationships.

Humility also assists us in using our collective imagination to bring to mind things that are not present to our senses, creativity to develop original ideas that have value, and innovation to put new ideas into practice. All this will be needed for us to move beyond

the limitations of our current individual and collective knowledge, skills, experience and imagination. The culmination of these attributes could be termed our 'collective wisdom' and will be essential as we prepare for severe to catastrophic events.

Show compassion

Disasters create significant physical, emotional and psychological suffering within our communities including those called to respond, lead, manage and report, as well as those who bear witness either first-hand or through the many forms of media.

Accepting that our industry's primary motivation is to do our very best within acknowledged limits and granting ourselves permission to emotionally reflect in the face of adversity, means we cannot help but have a deep sense of compassion with all of those who are touched in some way by these events. Compassion alleviates emotional distress, motivates us to think beyond our own suffering, and moves us to action for the benefit of others.

Grant forgiveness

We will all experience, to a greater or lesser degree, feelings such as regret, remorse, anger and frustration. Understanding that we could not choose the event, that its severity went beyond our internal and external resources and knowing, that we were motivated to do the best we could within these constraints, then we soon come to realise that there is so much more that we individually and collectively need to learn, but perhaps more importantly, that blame is futile.

In the face of such adversity most of us will reflect on our own perceived limitations and over time forgive ourselves for those things that we did or didn't think, did or didn't say, or did or didn't do. Having reached some sense of inner peace about our own perceived limitations we owe it to grant forgiveness to others for they have endured the same internal suffering.

There are other ethical considerations for leadership in challenging environments but, in any event, without ethics underpinning our leadership, we are likely to fall short of maximum proficiency and minimum harm.

In summary

Australia has significantly improved its ability to prepare for, respond to and recover from disasters. We have, however, reached a point of limitation in our capability to conventionally mitigate the consequences of severe to catastrophic events. Limitations exist in the physical world and also in our minds. Here is what we can do:

- accept the inevitability of disaster as a premise

- understand our points of limitation, both externally and internally, in managing severe to catastrophic effects

- get better at improving our existing capabilities by reflecting on and implementing the outcomes of inquiries and other processes

- change our approach to residual risk by understanding that rarity does not diminish consequence

- explore residual risk as manifested consequence to identify complex problems and develop innovative, creative solutions well ahead of the event

- better understand how critical ethical aspects of leadership are in responding to the emotional and psychological effects of disasters.

Opportunities to close gaps of residual risk are available now. We must take them.

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Managing spontaneous volunteers in emergencies: a local government perspective

Lucy Saaroni, Yarra City Council, explains how a risk-benefit assessment can help local government engage with spontaneous volunteers. ®

ABSTRACT

In Victoria, the state government expects municipal councils to make arrangements for the management of spontaneous volunteers in emergencies (Department of Justice 2013). As the primary interface between the public and all tiers of government, councils will invariably be confronted by offers of assistance from spontaneous volunteers, possibly at municipal emergency relief centres, but also via municipal facilities, council social media channels and local groups with ties to the council.

Refusing to interact with or actively manage spontaneous volunteers will not diminish the increasing number of people offering to help, as the 2003 and 2009 bushfires and the 2010 and 2011 floods in Victoria have demonstrated. A risk-benefit assessment can help councils understand why they should engage with spontaneous volunteers as a matter of effective municipal emergency management.

Introduction

The expectation that municipal councils will make arrangements for the management of spontaneous volunteers in emergencies is not set out in any specific legislation. Additionally, no explicit guidance has been provided to councils on how to make a decision about managing spontaneous volunteers. Ultimately it is up to councils to decide how they will respond to offers of assistance. The question for councils is: should Council accept and integrate spontaneous volunteers into its emergency management operations? Or should Council redirect spontaneous volunteers to other agencies with a history of volunteer management in emergencies like Red Cross?

Determining a local government approach to responding to spontaneous offers of in-kind support is complex. There are risks and benefits associated with a policy to engage with and induct spontaneous volunteers into emergency activities. Additionally, there are risks and benefits associated with a policy to refuse spontaneous volunteers integrating with Council emergency management activities.

A recent study was conducted in Frankston City Council to identify and assess risks and benefits of using or refusing spontaneous volunteers. Findings from the case study confirmed the importance of developing a municipal-based spontaneous volunteer management plan as a means to effectively harness the capabilities of spontaneous volunteers, while managing risks posed by the added managerial requirements.

The study established that perceptions around spontaneous volunteers and their management could be flawed. Four main categories of risks and benefits were identified around a policy to accept or refuse offers of assistance from spontaneous volunteers. The categories were:

- the 'unknown' nature of spontaneous volunteers
- litigious and insurance issues
- financial implications
- social implications.

The 'unknown' nature of spontaneous volunteers

The identities, qualifications, motivations and capabilities of spontaneous volunteers may not be easily verifiable. However, local Volunteer Resource Centres can act as a filtering system to register, process (and potentially assess) spontaneous volunteers on Council's behalf. It is possible to minimise the risk of engaging incompetent, under-qualified or disruptive volunteers by adopting a management plan whereby volunteers are assigned only to tasks they are assessed as being capable to undertake. After major emergencies, many mundane yet essential activities may be required: cleaning, laundry, catering, processing material aid, traffic management, administration, etc. These tasks may not necessarily be conducted in Council emergency relief, recovery or co-ordination centres, meaning that working directly with vulnerable and affected people can be avoided completely.

Just as some spontaneous volunteers may not have appropriate qualifications, capabilities and motivations, others may actually have specialist skills and local knowledge, which would greatly benefit emergency management activities. Community members may be able to add fresh perspective or enhanced local knowledge, thereby assisting the work of council officers in identifying and assisting people in need of relief and recovery assistance. There is obvious value in incorporating local knowledge provided by willing spontaneous volunteers who are intimately linked to the local geography and social networks. However councils need to scrutinise that local knowledge for accuracy and relevance. A process on why and how information is assessed can be detailed in a spontaneous volunteer management plan so that volunteers can refer to this if their information is being challenged.

Integrating spontaneous volunteers into council activities would likely minimise ad hoc groups and volunteers instigating potentially dangerous activities without endorsement from recognised and authorised emergency management agencies. A policy of acceptance and integration of spontaneous volunteers into council activities may therefore prove to be a more fruitful exercise in risk mitigation: for the council, for agencies requiring volunteer support, and for spontaneous volunteers themselves.

Litigious and insurance issues

By enlisting spontaneous volunteers to undertake work on behalf of councils there is a potential for councils to be held liable for damaging acts caused by its volunteers. Councils are covered under Liability Mutual Insurance policies for claims involving spontaneous volunteers in the same way they are covered for claims involving 'regular'/non-spontaneous volunteers (MAV Insurance 2011). Where councils are found to be negligent towards volunteers, coverage is provided under this insurance. Furthermore, many councils have personal accident and health and safety insurance policies that provide coverage in circumstances where councils are not deemed negligent.

It is also worth noting that there is little evidence to suggest that municipalities would be sued for activities undertaken by spontaneous volunteers. Additionally, a formal review of tort law in Australia in 2002 found that cases against volunteers themselves are negligible (Commonwealth of Australia 2002).

Financial implications

Whether councils choose to accept or refuse offers from spontaneous volunteers, any spontaneous volunteer management plan requires a level of human and material resourcing. Every emergency event is unique and exact cost estimates are impossible to provide. However, direct council costs relating to the implementation of a spontaneous volunteer

management policy and plan would likely include trained staff and facilities for:

- communicating with spontaneous volunteers
- registering, screening and processing volunteers (unless this is done by an external agency such as the Volunteer Resource Centre).

If councils choose to accept and integrate spontaneous volunteers with council activities, additional costs could include:

- staff required to train, brief, roster and supervise the volunteers
- equipment and protective clothing
- transportation for deployment
- accommodation and meals
- counselling after the emergency event.

But these costs need to be considered in conjunction with financial benefits. In Victoria, the value of volunteer time alone has been estimated at $19 million a year (Ganewatta & Handmer 2009). Specific research on spontaneous volunteerism has established that the contribution offers a means for governments to save on costs (Bittman & Fisher 2006).

Using spontaneous volunteers presents an opportunity for councils to save on ongoing service delivery costs and also safeguard their business continuity immediately following an emergency event. Almost every emergency management role designated to council staff is an 'add-on' to substantive positions, 'effectively making their emergency management role a "bit" part of their day-to-day roles' (MAV 2011, p. 6). Allowing spontaneous volunteers to undertake certain council activities, council staff can focus on competing priorities such as restoring and managing local infrastructure.

There is also an added element of gender imbalance in local government employment that can negatively affect council business continuity during emergencies. In Victoria, significantly more female than male staff are employed. Given that women may need to look after children or the household during emergencies, spontaneous volunteers provide a potential solution to council female staff absenteeism in emergencies and provide councils with additional capacity to maintain business continuity.

Financial costs and benefits of using spontaneous volunteers do not provide an accurate overall picture for councils keen to determine a best-practice approach to spontaneous volunteer management. Consideration is required for balancing financial outlays associated with a policy to accept and integrate spontaneous volunteers against the financial cost of repairing damage to reputation as a result of a policy to refuse assistance of spontaneous volunteers. Experiences of the 2003 and 2009 bushfires in Victoria have shown that refusing to take advantage of and value the input of spontaneous volunteers may lead to a degradation of organisational reputation and

disengagement with ongoing volunteering and civic engagement (see Cottrell 2010, Indian 2007, Steffen & Fothergill 2009). This can result in longer-term financial and social disadvantages to both councils and their communities.

Social implications

Experiences in Victoria and further abroad demonstrate that engaging with spontaneous volunteers can greatly benefit individual, organisational and community recovery. Individual recovery is intimately linked with spontaneous volunteerism because in an emergency event, spontaneous volunteers are legitimate stakeholders; they have a right and may have a need to volunteer as part of their personal recovery process, especially if they are affected directly by the emergency. The Federal Government claims that affected persons should be involved in emergency management activities for practical reasons because 'disaster-affected people, households and communities understand their needs better than any of the professional, government, non-government or corporate supporters' (Commonwealth of Australia 2011, p. 1).

In addition to benefitting individual recovery, spontaneous volunteerism has been found to directly benefit organisations. Engaging affected people who want to help provides organisations with a means to shift away from encouraging passivity in communities, to fostering a proactive and connected community that assumes shared responsibility for emergency management. Spontaneous volunteerism also benefits staff welfare by boosting staff morale and productivity (see Kendra & Wachtendorf 2001). It builds relationships between the organisation's staff and community members; this has long-term benefits for future council service delivery.

Finally, spontaneous volunteerism can significantly speed up community recovery. One of the lessons following the 1983 Ash Wednesday bushfires was that 'communities recover best when they manage their own recovery' (Hill, Hill & Gray 1987, p. 11). When spontaneous volunteers identify as community members they have both a right and a responsibility to assist in the rebuilding of their community. Council's role should be to foster and harness those rights and responsibilities wherever possible. Given the immediacy of spontaneous volunteerism it is important that Council has processes in place to manage this goodwill as 'recovery started badly is almost impossible to reclaim given its long-term impacts on the structure, relationship and functioning of the community' (Leadbeater 2013, p. 46).

The key to effectively managing spontaneous volunteers is having the ability to strike a productive balance between the management of core business activities and catering to the needs of all stakeholders; spontaneous volunteers included. A policy to accept offers of assistance from spontaneous volunteers (as long as they are within the parameters outlined in the spontaneous volunteer management plan) and communicating this policy and plan to stakeholders should allow councils to make the most of community goodwill while minimising many of the risks that spontaneous volunteerism presents.

Conclusion

Local governments become effective emergency managers when they are able to recognise *opportunity* in risk; when they can envisage beyond the initial chaos of response and lay solid foundations for relief and recovery operations.

There is ample evidence to suggest that it is more productive for local governments to conceptualise spontaneous volunteers as a positive, necessary and useful resource in the realm of emergency management. Indeed, a council policy to accept offers of in-kind support from spontaneous volunteers *where practical* is likely to be more beneficial in the long-term, financially, socially and psychologically, not only for Council, but for ratepayers, for spontaneous volunteers, and for other groups working alongside councils during the emergency event.

Having a management plan that clearly documents how, where, when and why spontaneous volunteers can and cannot be used in council activities is essential in being able to harness public goodwill. At the same time, this kind of well-scoped management plan facilitates council staff in coherently communicating refusals to people whose offers to help are rejected.

Approaching spontaneous volunteer management with a policy of engagement, acceptance and integration is not risk-free. Risk is a normal part of emergency management and effective emergency management is about placing risk in the hands of those who have a right, a responsibility, capacity and capability to manage it.

Kathy Ryan, Manager of Spontaneous Emergency Volunteer, Gabrielle Williams, Victoria Parliamentary Secretary and Craig Lapsley, Victoria Fire Services Commissioner at the launch of the Manager Spontaneous Emergency Volunteers Project.

Image: Lucinda Tucker, Volunteering Victoria

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About the author

Lucy Saaroni is an emergency management practioner working in the Victorian local government sector. She holds a MSc (distinction) in Risk, Crisis and Disaster Management from the University of Leciester, is a member of the Australian Institute of Emergency Services and has completed an Advanced Diploma in Public Safety (Emergency Management) at the Australian Emergency Management Institute.

Manager of Spontaneous Emergency Volunteers project

The Manager of Spontaneous Emergency Volunteers pilot project has been conducted in the G21 region[1] to recruit, train and support managers of spontaneous volunteers in an emergency. Volunteering Victoria is the lead agency for the project, supported by Volunteering Geelong, City of Greater Geelong and Australian Red Cross. The pilot has been incorporated in a State wide rollout of the program. Information on the success of the pilot project is available at: http://volunteeringvictoria.org.au/msev1-project/.

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1   The G21 region comprises the City of Greater Geelong, Borough of Queenscliffe, Colac Otway Shire, Golden Plains Shire and Surf Coast Shire.

Spontaneous Emergency Volunteers managers are trained to support spontaneous volunteers in emergencies in the Geelong region.

Strategic foresight in an age of uncertainty

By journalist, Rosemarie Lentini

Lieutenant Colonel Joseph Booth, Executive Director, Stephenson Disaster Management Institute, Louisiana State University.

We cannot plan for the future by looking at the past.

Climate change, ageing populations, terrorist threats and emerging technologies are contributing to a world of increased uncertainty. Only by scanning the horizon for long-term trends can emergency managers plan for a more resilient future. That is the advice of strategic foresight expert Lieutenant Colonel Joseph Booth, Executive Director of the Stephenson Disaster Management Institute at Louisiana State University in the United States.

Lieutenant Colonel Booth was Deputy Superintendent of Louisiana State Police when hurricanes Katrina and Rita hit America's Gulf Coast in 2005. During the two storms, he was the Chief of Special Operations, overseeing special weapons and tactics (SWAT), hostage negotiation and crisis response operations. His role included commanding and coordinating the emergency response to Katrina and Rita.

'We have been saying for decades, the world's a smaller place. A few years ago, things that happened on the other side of the world may not have had any impact. Now they may,' Lieutenant Colonel Booth said.

'Strategic foresight is about looking at the trends—regionally, nationally, internationally—and how they affect even the most local emergency manager. Although they may not be within the ability of a local emergency manager to influence, they may cause disruptions in the local environment. Even the root cause of them is to be understood so you can anticipate possible consequences in your local authority.'

In July 2014, Lieutenant Colonel Booth addressed the Australian Emergency Management Institute *Connections!* conference in Mount Macedon, Victoria. In his presentation, he said that countries around the world continue to be caught off guard by major crises. From the devastating spread of Ebola in 2014 to the growing threat of terrorist network Islamic State, disasters often cross political and geographical borders. However, he said that governments can prepare for future risks by taking a 'what if?' approach to disaster planning.

'Governments are increasingly at risk of cyber-attack as business-critical information is stored and processed online. Agencies should be asking: In the event of a security breach, do we have the tools to recognise, stop, and recover from the attack? Have we taken stock of our most critical assets and the impact on operations if they were stolen? How will we manage the risk?' Lieutenant Colonel Booth said.

The experienced strategist said governments and emergency managers have access to a plethora of reports to help identify future global threats, including the influential Global Trends Report. Produced by the National Intelligence Council (NIC) within the United States government, the report aims to stimulate thinking about rapid and vast geopolitical changes.

According to the latest report, Global Trends 2030: Alternative Worlds[1], the next 15 years will see the diffusion of power from hegemons to local networks, rapid population ageing, resource scarcity and the potential for more pandemics.

Lessons from *Hurricane Katrina*

For Lieutenant Colonel Booth, *Hurricane Katrina* is a 'good example' of how the use of strategic foresight in disaster management 'could mean the difference between a quick recovery and a protracted one'. *Hurricane Katrina*, one of America's most catastrophic

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1 View the *United States National Intelligence Council - Global Trends Report* at: www.dni.gov/index.php/about/organization/national-intelligence-council-global-trends

Megatrends	Description
Individual empowerment	Improved healthcare/education, social media access and poverty reductions will futher empower citizens.
Diffusion of power	Power will shift from countries like US to networks and coalitions.
Demographic patterns	Economic growth might decline in ageing populations; migration will increase; 60 per cent of people will live in urban areas.
Food, water, energy nexus	Population growth will strain increasingly scarce resources.

disasters, unleashed its fury on New Orleans in August 2005, killing 1 833 people. Levees failed, leaving 80 per cent of the city flooded and thousands stranded. Katrina destroyed hospitals, crippled emergency communication systems and destroyed local and state governments. A decade on, many individuals and businesses are still struggling.

'One of the problems with Katrina was that we were preparing for the last event that we had rather than preparing for future consequences,' Lieutenant Colonel Booth, who was right in the thick of it, said.

'We knew what the weaknesses of the city were. We knew that the city was below sea level. We knew that it was prone to flooding. We didn't know how vulnerable the levee was. We didn't know that it was constructed in such a manner that it would eventually allow it to fail. So I guess foresight is not assuming your defences are as reliable as you want to assume they are.

'We were planning by and large for the disaster to be inside of a scale in which we could respond. We were also assuming that the model of response would continue to apply. We'd never had an incident where it hadn't, so we didn't even think in that regard.

This bridge in Empire, Louisiana, was closed for almost 60 days after *Hurricane Katrina* went through the area in 2005.

'*Hurricane Katrina* did away with local authority. It destroyed the local capability and the whole model of response. We had to reinvent how to respond on the run while we were coping with the disaster.

'Looking back now, I can say I wish we would have planned for a bigger disaster of greater magnitude. But I think we have a tendency to prepare to the limit of our resources. Katrina is proof that you also have to prepare for events far beyond the management ability of local resources,' Lieutenant Colonel Booth said.

Lieutenant Colonel Booth also said one of the lessons of Katrina was the need for individuals to prepare themselves for disaster. This will be even more important in the future as economic constraints force governments to slash budgets.

'I think one of the main effects of Katrina is that it has reinforced the ethic that people have to be more prepared to be on their own and not assume the government is going to be there to take care of their emergency needs, especially in the first 72 hours.

'Because when you look at government resources, and here is a little strategic foresight, you see government cutting back, able to provide less services and at the same time demand for services may be going up because the magnitude of disasters is increasing. So what has to happen is that people have to be more reliant on themselves, their neighbours and not on government infrastructure,' Lieutenant Colonel Booth said.

The experienced emergency commander now heads a United States institute which works to improve disaster response management through research and education. With the world's best intelligence at his fingertips, Lieutenant Colonel Booth's advice for emergency managers is to fight the tendency to plan only for expected risks.

Lieutenant Colonel Booth said, 'We have a tendency—and it's a natural tendency—to look at the future in terms of what's happening now. We have to look at the future in terms of the future. How are we going to operate in new and changing environments and how do we apply those tools?'

Understanding risk factors in a disaster environment: evaluation of a three-week study tour of Japan

Adam Lebowitz, University of Tsukuba, Japan, Kelsea Clingeleffer, Liana Riddington, Zara Hoare, and Warde Macintosh, University of Tasmania, provide insights into the advantages of study tour experiences.

ABSTRACT

On-site tours of post-disaster areas can deepen conceptual understanding of risks in a disaster environment. This evaluation describes highlights of a three-week program in Japan for Australian students of disaster psychology to study disaster mitigation and management in a different cultural setting. Students visited north-eastern areas of Japan affected by the Great East Japan Earthquake of 11 March 2011, and centres for learning and memorialisation (the process of preserving memories of people or events) in Tokyo. This visit allowed students to meet experts in disaster risk reduction and recovery and allowed observation of how theory and practice in these areas have been developed in Japan.

Introduction

A key focus of the study of community, environmental and organisational psychology at the University of Tasmania is disaster risk reduction (DRR) originating from research into disaster recovery in the Asia Pacific region. Introducing students to cross-cultural aspects in this field is an important component of their study. It develops an understanding of the many ways DDR and recovery are conceptualised and implemented. In addition, higher-level education could provide opportunities for inter-cultural learning and experience in an increasingly interconnected world.

The New Colombo Plan Scholarship Program[1] was established to promote relationships between Australia and countries and institutions in Asia. Using this scholarship, the University of Tasmania sent four undergraduate psychology students for a three-week period in October 2014 to the University of Tsukuba in Japan to study disaster mitigation and management. Japan, by its very geography, is vulnerable to extreme natural events and a written history concerning disasters dates back almost one thousand years

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1   New Colombo Scholarship Plan. At: http://dfat.gov.au/people-to-people/new-colombo-plan/scholarship-program/Pages/scholarship-program.aspx.

(Kitahara 2006). This long experience with natural events, disaster management and recovery, including the 2011 Great East Japan Earthquake where fire, flood and nuclear meltdown after a tsunami was experienced, makes Japan a highly appropriate country for academic study.

Fukushima

In 2011 large areas of north-eastern Japan were hit by the tsunami; however, it was the nuclear reactor accident in Fukushima that has created an ongoing disaster. Technical accidents can be particularly stressful for communities because of the aftermath of unresolved environmental toxicity (Cline *et al.* 2010, Bonanno *et al.* 2010, Freudenburg & Jones 1991, Marshall & Picou 2008, Picou 2009, Shultz *et al.* 2011). The study tour began in the coastal area including Iwaki and the smaller towns of Tomioka, Hirono and Kokonaraha closer to the reactor. These were guided by Ms Suzuki Rieko, a geriatric psychiatric nurse from Iwaki.

Iwaki, the second largest city in northern Japan by population, lost most of its oceanfront to the tsunami and many businesses relocated to temporary shopping districts that had been established throughout affected areas in order to provide sources of income. Initially, the 30 km exclusion zone from the nuclear reactor plant extended into city limits and half the city population was evacuated. Now, four years after the event, in addition to those residents who have returned, over 24 000 evacuees from the continuing 20 km exclusion zone reside in 3 500 prefabricated houses, apartments, and public housing blocks that are still in force. While re-establishing community is a priority among survivors (Tatsuki & Hayashi 2001) it is difficult to achieve since the maximum stay in this area is two years.

Students stayed at a traditional inn in Iwaki. Other hotels still mainly accommodate workers doing repair work. Among the communities ordered to leave, many fled northwest (where wind carried the radiation). The inn owner and Ms. Suzuki spoke of the difficulty experienced in re-establishing industries such as fishing and farming. Research has shown the loss of natural economic resources is a potential stressor (Hobfoll 1989). The farming of cotton, instead of rice, to reduce soil salinity shows adaptability and innovation in this situation.

Visits to sites like this large dosimeter next to Kokonaraha town hall, contribute to the local economy.

This deserted boat remains stranded in Tomioka.

Railway tracks to Tomioka Station, Fukushima are unused.

Memorial at Yokoamichô Park for victims of the 1945 air raid on Tokyo.

The towns of Tomioka, Kokonaraha and Hirono, skirting the exclusion zone towards the ocean, are still largely deserted. To discourage looting, the through-road is closed at night and patrolled by police. Tourism and visits to sites like a large dosimeter (a device that measures exposure to radiation) next to Kokonaraha town hall, have become an important economic activity. Pocket dosimeters are common and area readings are printed in the daily newspaper. Access to this data seems to allay some concerns about environmental safety. Ms. Suzuki said all foods—rice, vegetables and fish—are tested and can be traced to points of origin.

It will be interesting to see how the current situation is seen in the context of the disaster itself; i.e. whether there is a positive or negative outcome. Positive and negative outcome expectancies refer to individual beliefs regarding how an event will impact a person (Paton, Burgelt & Pryor 2008). Many causes of mental stress from situations of environmental contamination have been studied, but others unique to Fukushima have emerged. For example, before the disaster wild boar were hunted to cull populations and reduce attacks on food crops. The meat was sold to specialty restaurants. Contamination has made this food source unsalable and carcass disposal problematic. As a result, the wild boar population growth has caused difficulties for local farmers who experience increased crop damage and the federal government has been requested to assist with wild boar disposal (Asahi Shinbun Evening Edition 2015). These kinds of specific situations create certain dependencies in the area and could benefit from detailed study into how they determine the level of future engagement in DRR.

Tokyo-area museums and learning centres

In Tokyo museums and learning centres serve preserve information about past events. The students visited these facilities to explore the educational, cultural and historic aspects of disaster. The Edo-Tokyo Museum and nearby Yokoamichô Park exhibit two modern disaster events: the 1923 Tokyo earthquake and Tokyo air raids at the end of World War II. The main cause of mortality in both events was fire and its effects on humans. How fire can affect the material environment features prominently in the displays.

The 'ground level' similarity of these events informs perception in that both are termed 'disasters' (the ideogram sai 災) although one is 'natural' (shinsai 震災 'earthquake disaster') and the other is literally 'war-related' (sensai 戦災). This conflation of disaster events is reinforced by a monument to the air raid victims built in 2001 at Yokoamichô Park beside the earthquake museum. Beside this monument is a small cenotaph to Korean residents killed by mobs during post-earthquake riots.

At these exhibits it is possible to see elderly visitors who experienced the events as children. At the Edo-Tokyo Museum a passer-by, hearing the students speak English, approached the group and candidly told of family members who died in the raids and how his

children and grandchildren now lived in the US. These impromptu meetings demonstrate the many complex experience of disaster in Japan.

Future preparedness for disaster is offered at the Honjô Life Learning Center run by the Tokyo Fire Department. These learning centres are popular with primary-level school tour groups and help to develop individual competencies, which are linked with more collective efficacy in Japan (Paton *et al.* 2010). The technology level of demonstrations was very high. For example, the earthquake simulator chamber controls were pre-programmed to mimic seismic intensities and rhythms of specific events (e.g. in Kobe, Niigata-Chuetsu and Miyagi). Since familiarity with natural hazards is linked to preparation (Paton 2008), such demonstrations improve interpretation of information and also empower communities (Paton *et al.* 2008). Other simulations included a hurricane tunnel and an area where people can practice using a fire extinguisher. A retired fireman acted as guide and answered student questions from his first-hand experiences.

Miyagi

Ishinomaki and Sendai in Miyagi Prefecture were also visited. The epicentre of the 2011 earthquake was off the coast but the topography of this area focused and intensified the effect of the resulting tsunami. The Onnagawa region, north of Ishinomaki, was profoundly affected with water levels rising above 16 metres. As a result, a four-story concrete structure was upended and displaced, railway cars were deposited on mountains, and the local hospital on a mountain overlooking the harbour was flooded. Local taxi tours of the area provide a unique perspective of the physical and emotional experiences of witnessing such a disaster.

Interestingly, a possible fire catastrophe was unintentionally averted. There is a large natural gas facility beside the river inlet that divides the coast closer to the Ishinomaki city center. Although seafood factories on the opposite side were heavily damaged, the bridge became an unintended breakwater for the tsunami, protecting the gas facility. This is known as 'unplanned functioning'. Usually, infrastructure malfunction can result in technical disaster (Edelstein 2004). However, in this instance, unplanned functioning prevented further disaster. This example demonstrates the unknown variables in environmental risk management.

Visiting Ishinomaki and the prefectural capital, Sendai, allowed the group to observe the different ways of rebuilding community, capacity and knowledge. The non-government organisation, Save the Children Japan, voiced the concerns of parents to local government to fund a new children's recreation centre in Ishinomaki. The staff were proud to say design elements for the structure came from the children themselves.

The group also visited the new International Research Institute of Disaster Science (IRIDeS) and Megabank at the University of Tohoku in Sendai. In Japan, national universities act as government research centres and this large-scale public investment is to advance knowledge for future disaster policy. The IRIDeS

The hurricane tunnel in the Life Learning Center, Tokyo gives visitors an experience of high wind speeds.

This four-story building in Onnagawa, Miyagi, was upended by the 2011 tsunami.

Examining photos of the flooded areas taken by the taxi driver (r.) on the hilltop hospital overlooking Onnagawa.

The staff from Miyagi Megabank, Tohoku University with the students in the tour group.

combines multi-disciplinary approaches including engineering, social science, and information management. The Megabank is a biomedical research centre conducting a 10 000-subject longitudinal study investigating the multi-generational effects of the disaster over several decades. The tour of these facilities concluded with a seminar hosted by staff at the Megabank faculty organised the UN Office for Disaster Risk Reduction Conference in Sendai in 2015.

Conclusions: study tours and disaster education

This visit allowed students to meet experts in disaster risk reduction and recovery and see how theory and practice in these areas has developed in Japan. It also increased the appreciation of the long-term nature of disaster recovery and how psychologists can complement the activities of other professionals. Research models show that personal, civic and organisational levels are the mediating factors that affect people's responses to hazards. Looking at Japan, history and culture could certainly be added. Overall, a study tour of this country in this area reveals the interdependency of these elements.

The challenges with post-disaster decision-making are also apparent. Large top-down initiatives such as the Tohoku University research facilities show high efficiency in administering resources. Community-level initiatives, such as the children's community centre, also have positive outcomes. However, tour guides stressed the issue of changing demographics exacerbated by the disaster. When younger families choose not to return many elderly family members become isolated. Lack of privacy in temporary housing and future uncertainty has caused emotional stress. Therefore, mental health care needs increase even with reduced capacity due to tsunami-damaged medical facilities (Zhang *et al*. 2014). Looking comparatively at disaster preparedness based on culture (Paton *et al*. 2010), place and livelihood, attachments can inform the adaptive capabilities of communities. It is clear when visiting temporary housing that differences exist not only between communities, but also within communities and between generations. Japan-based documentary filmmaker and music producer, Jeffrey Jousan, recorded the struggle of displaced small-scale agriculturalists and the elderly that highlights the importance of community participation in creating empowerment (J. Jousan, personal communication, 25 October 2014).

As disaster study becomes a more comprehensive field, the competencies will become better structured. Undergraduate programs can send students overseas as part of their coursework to partner universities. Japan is an ideal country for study in emergency management and disaster recovery areas.

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About the authors

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Australian Government

Attorney-General's Department
Emergency Management Australia

2015 RESILIENT AUSTRALIA AWARDS

THE RESILIENT AUSTRALIA AWARDS, NOW IN THEIR 16TH YEAR, ARE ONCE AGAIN OPEN FOR APPLICANTS.

The Resilient Australia Awards is a national program to recognise and promote initiatives which strengthen community disaster resilience across the nation. Resilience means many things, but ultimately it is about making our communities safer, stronger, more resilient and better prepared to manage the effects of natural disasters.

By celebrating innovation and exemplary practice, the awards showcase work that is often unrecognised, inspiring others to think about how they can be better prepared and more disaster resilient.

The awards are an Australian Government initiative proudly sponsored by the Attorney-General's Department, in conjunction participating states and territories.

A HISTORY OF CREATIVITY

Commencing in 2000, the Resilient Australia Awards program has a respected history in Australia's emergency management sector. The awards have recognised many outstanding contributions by communities towards disaster management, including risk assessment and mitigation, education, training and research, community awareness and engagement – as well as to response and recovery.

In 2014 one of the national awards went to *Tsunami: The Ultimate Guide*, an engaging online resource on tsunami with an Australian focus that was designed as a teaching resource, as well as for the general public. The project was a collaboration between Surf Life Saving Australia and the Australian Tsunami Advisory Group.

Projects don't have to be technical. The Bundaberg North State School, for example, responded to the trauma of the devastating 2013 floods by developing the *BEAR Plan*, which taught students calming strategies around the words Breath, Exit, Ask, and Relax. Students were given teddy bears for comfort when they became emotionally overwhelmed. Additionally, community led activities like the Red Bucket Project and Know your Neighbours programs were implemented in Violet Town. They involved the Fire Brigade conducting a door knock giving people a red bucket with up-to-date information, brochures and advice to prompt them to take responsibility for their own fire safety.

THE 2015 AWARDS

This year there will be **three national awards**: an overall national award, a new award solely for schools, and a photography award for photos that communicate work in disaster resilience.

The awards cover everyone in participating jurisdictions: individuals, non-government organisations, small and large businesses, local and state government, schools, education institutions, research bodies and emergency service agencies.

Entries are judged first at the state and territory level. Winners of the state and territory awards are then considered for the national awards.

Applications are open until **midnight 9 August 2015**. The awards will be announced later in the year. For more information and to apply online go to **https://resilient.awardsplatform.com**.

STATE AND TERRITORY CATEGORIES

Resilient Australia Community Award
Communities, non-government organisations, tertiary colleges and universities

Resilient Australia Business Award
Private sector and business

Resilient Australia Government Award
Local government and state/territory government

Resilient Australia School Award
Pre-school, infants, primary and secondary schools

Resilient Australia Photography Award
(People's Choice Award) Open to individual photographers/copyright holders

Australian & New Zealand Disaster and Emergency Management Conference

Gold Coast, May 2015

The Australian & New Zealand Disaster and Emergency Management Conference was held at the Jupiters Hotel, Gold Coast, 3–5 May 2015. The conference theme, *EARTH, FIRE AND RAIN* personified the in-depth discussions on natural disaster prevention, preparedness, response and recovery both in Australia and globally.

The conference was attended by over 450 delegates and featured 10 keynote presenters, 66 session presenters, eight interactive workshops and panel presentations, and 27 poster presentations.

The accompanying exhibition featured 28 organisations presenting products and services to the sector. This provided good networking for guests to engage, continue discussions and maximise their conference experience.

Conference host associations included the Bushfire and Natural Hazards Cooperative Research Centre, Australian Institute of Emergency Services, Australian and New Zealand Mental Health Association Inc., and the Association for Sustainability in Business Inc. Speakers provided very beneficial, powerful and thought-provoking presentations.

Information about the 2016 conference is at www.anzdmc.com.au.

Keynote address by Deputy Commissioner Brett Pointing APM, Regional Operations, Queensland Police Service.

Delegates took the chance to reconnect and make new contacts.

Winner of the Most Valuable Contribution to the Program, Tia Rowley, Queensland SES, with Assoc. Prof. Brett Aimers (left) and Elle Hilton, Toll Remote Logisitics (right).

Fire Rescue Safety were just one of the exhibitors offering delegates industry information.

11th Emergency Media and Public Affairs Conference

Sydney, June 2015

Auckland, July 2015

The Emergency Media and Public Affairs (EMPA) Conference for 2015 attracted executives, academics, industry leaders, practitioners and professionals in media and communications. Participants were treated to frank and fearless discussions and enjoyed time to meet and connect with others in the relaxed forums and excellent setting.

The conference included workshops sessions on a range of topics. Delegates shared their specific tools and perspectives that help agencies reach audiences, be understood, be believed, and keep people safer.

Subjects covered 'helping the non-communications people in your team do great communications', media editing approaches, and communication considerations for audiences with special needs. These were great hands-on sessions.

Of particular note were presentations from keynote speakers including Mark Crosweller, Director General of Emergency Management Australia, Joe Buffone, Deputy Commissioner of Emergency Management Victoria, and Mia Garlick from Facebook Australia.

As always, EMPA brings in international speakers and Dr Brooke Liu, University of Maryland, Washington and Silke Hampson, UN Mission to South Sudan, provided insights and shared their considerable experiences in their fields of communication deep research and outreach communication.

The EMPA conference is always about sharing experiences and presentations by Reegan Key, Emergency Management Victoria, Anthony Clarke, NSW Rural Fire Services, and Dan Neely, Wellington Emergency Management Office were highly thought provoking and entertaining!

The big benefit to participants is the access to latest leadership thinking in emergency planning and response and shared experiences with others in this area.

Importantly, as a not-for-profit organisation, EMPA is committed to finding lessons in this important field. Funds from the conference are channelled back into research and sharing lessons identified.

Next year's EMPA conference will again be sponsored by Emergency Management Australia and will be held in Melbourne.

EMPA New Zealand conference

New Zealand's specialist Disaster Communications Conference was help in Auckland at the end of July. Keynote speakers included The Hon Nikki Kaye Minister of Civil Defence, Catherine Matheson Fortis BC, Canada, Jacqui Bridges General Manager Communications at NZ Met Service, Dr Fran McGrath Deputy Director of Public Health, Ministry of Health, Sarah Stuart-Black, Director of Civil Defence Emergency Management, Mark Crosweller Director General, Emergency Management Australia, and Antony Byers Director of National Security Communications.

EMPA is the only representative organisation of emergency service and crisis communications practitioners in the world. EMPA's annual conferences in Australia and New Zealand helps fund research on emergency and disaster communications and community response and recovery. It also administers an internationally-recognised accreditation programme for emergency public information managers.

EMPA conference participants enjoy relaxed forums where meeting others and sharing experiences is a real benefit.

Notes from the Field

By Ian Leckie, Community Engagement Coordinator and Andrew Richards, Manager Community Engagement NSW SES

The township of Uranquinty is situated near Wagga Wagga, on the NSW-Victoria border. The town's 715 residents live on a flat catchment without a flood gauge. There is often little warning of a flood other than rainfall predictions and observations. Heavy rainfall falls in the surrounding area and flooding affects up to 80 properties and frequently cuts access routes into Wagga Wagga. In 2010 homes in Uranquinty were flooded and in 2012, flooding caused significant evacuations. Residents realised that a collaborative effort to preparing for floods would produce better property protection and evacuation results in future.

A member of the UCSG activates a community phone tree after receiving a flood warning from the NSW SES.

Being involved

The Uranquinty Community Safety Group (UCSG), an offshoot of the town's Progress Association, was recruited, formed and developed a flood action plan supported by the NSW SES. This took place over a five-month period and culminated in a community-led disaster simulation exercise.

Local buy-in, ownership and involvement was vital. Local suppliers, people at-risk of flooding, and local organisations, such as the Wagga Council and Origin Energy, were approached to participate in and to provide financial and in-kind support.

Community-led planning: May – October 2014

A representative from the Uranquinty Progress Association approached the SES during a presentation in Wagga Wagga to ask for NSW SES support to prepare and plan for the next flood. Other residents from Uranquinty were recruited to join the UCSG.

Monthly meetings were held to formulate and establish the plan for the next emergency. The UCSG discussed tactics about notifications to the community and plans to evacuate residents, often applying lessons from overseas and local flood events. The committee decided to conduct an exercise on Sunday 19 October to test the plan.

Work on the plan intensified in September and October as phone trees, maps, flowcharts, helpers, teams, contact lists, tactics and timings were refined. Local media were enlisted to help cover the day.

Belinda McMahon and other members of the UCSG each led six teams of locals, who were mobilised to doorknock and evacuate residents. This also provided an opportunity to build rapport, impart and gather information.

Exercise Wirraway: a disaster simulation

Exercise Wirraway was held on Sunday 19 October 2014 from 8.30am to 2.00pm. The day started with a 'Flood Bulletin' from the NSW SES that triggered committee members to activate a phone tree and call residents who may be most affected. Teams of community members were sent to knock on the doors of over 80 properties providing information and instructions on the 'evacuation' as well as gathering other information such as contact details and discussing preparedness advice.

Residents were encouraged to 'evacuate' to the community hall by midday where a community barbeque was arranged. About 100 people met at the community hall to learn about building sandbag walls, some flood rescue skills, and how they could help one another during times of emergency. A number of water rescue 'throw-bags' were given to Uranquinty by the SES in appreciation of the efforts they had made.

The UCSG has pledged to review and fine-tune the arrangements annually to ensure the plan stays fresh and accurate and residents stay aware of what to do. The group is also planning for other emergencies that may affect the town.

A sustainable future

This approach challenges traditional thinking about emergency management. Disasters have been regarded historically as a government responsibility leading to agency ownership and community reliance on emergency services for help. This new approach aims to reduce the impact of emergencies on communities by increasing community ownership and building community resilience.

This is especially relevant where there are low numbers of local volunteers, a reduced SES presence, or where events are too rapid to allow a timely response by emergency services organisations. The success of community-led approaches is often enhanced where existing and motivated community groups and resources can be activated, or to redirect community spirit following a recent disaster.

Where are they now?

The UCSG has since gone on to plan for other potential disasters including bushfire and a major transport disaster, each a significant risk for the town. During a recent After Action Review with the NSW SES, Uranquinty residents acknowledged that applying local knowledge to local solutions has brought them closer together as a community and they feel they are better placed to manage future events.

The NSW SES receives support for this type of approach. NSW SES has applied similar successful activities in other communities including Port Macquarie-Hastings, Tumblegum and Uki, as well as observed efforts undertaken in other states. The next phase of this community involvement will be to consolidate a range of approaches into a suite of tools for SES members to apply in different community contexts and risk profiles.

Contact: Andrew Richards, andrew.richards@ses.nsw.gov.au.

Local children learn from NSW SES members how to safely rescue people from floodwater using a throw bag. This technique allows the rescuer to remain on the shore during the rescue, thereby reducing their exposure to risk.

Members of the Uranquinty community learn how to fill sandbags and build their own effective sandbag wall to help stop floodwater entering properties.

AUSTRALIAN EMERGENCY MANAGEMENT LIBRARY

In May 2014 the Government announced that the Australian Emergency Management Institute (AEMI) would relocate from its facility in Mt Macedon, Victoria to Canberra, ACT.

Along with the AEMI move, the Australian Emergency Management Library was relocated to the Lionel Murphy Library at the Attorney-General's Department, 3-5 National Circuit, Barton, ACT.

The library first opened in 1956 and has developed into the largest emergency management library in the southern hemisphere. The library has over 4 000 members worldwide, and provides information to individuals, local government, universities and emergency services.

Membership and library services are free and resources focus on all aspects of emergency management around the world. The collection comprises over 37 000 items and the library can be accessed using the Online Public Access Catalogue (OPAC). Members within Australia can request to borrow any of these items, which can be posted within Australia only.

Subject areas include disaster recovery, business continuity, risk management and leadership. The Web Discovery Layer gives members access to thousands of records, including newspaper and journal articles, eBooks, conference proceedings and reports. This is done with a single search across all library databases and is accessed using MyAthens login details or via the search box on the Australian Emergency Management Knowledge Hub research page https://www.emknowledge.gov.au/research.

The relocation to Canberra changes the way some services are delivered and also brings new opportunities for the library to meet the changing needs of its members. Core services available in the library have not changed. Members can request items and submit reference enquiries using the online forms on the library catalogue web page https://emlibrary.spydus.com/cgi-bin/spydus.exe/MSGTRN/OPAC/HOME.

Library staff welcome visitors to the library, however it is best to contact the library to make an appointment.

The Australian Emergency Management Library's homepage and catalogue access portal.

Australian Emergency Management Library
Attorney-General's Department
3–5 National Circuit, Barton ACT 2600
(+61) 2 6141 4784
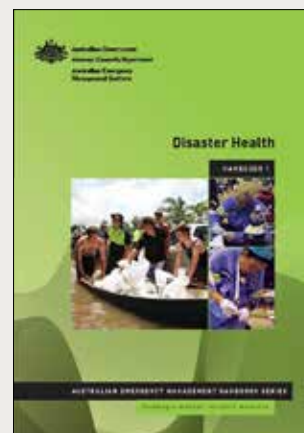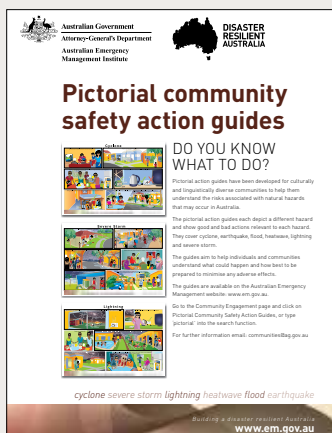**www.em.gov.au/library**

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Emergency Management Australia

THE NEW
EMERGENCY MANAGEMENT AUSTRALIA
WEBSITE WILL BE AVAILABLE EARLY AUGUST

www.ag.gov.au/EmergencyManagement

The new Emergency Management Australia webpage sits within the Attorney-General's Department website www.ag.gov.au and continues to uphold the department's aims to build national emergency management capability and community resilience through education, collaboration and innovation.

GET READY

DISASTER RESILIENT AUSTRALIA

Building a disaster resilient Australia