CREATING COMMUNICATION PATHWAYS TO HELP INCORPORATE LOCAL KNOWLEDGE INTO EMERGENCY MANAGEMENT AND DECISION MAKING

Abstract

Communities can provide valuable locally based information about emergencies and how they may evolve to support the incorporation of local knowledge. The community is defined for these purposes as any one person or persons who are a trusted source that can represent the interests of their community.

Reviews of past emergencies demonstrate the value of incorporating local knowledge. For example, the 'Review of the 2010-11 Flood Warnings & Response' (The Review) highlighted that during the 2010-11 Victorian flood events, local knowledge was used to good effect in some instances to inform decision making, however in some instances local knowledge was allegedly ignored, discounted or not used as an information source which subsequently impacted on the response.

The Victoria State Emergency Service (VICSES) is implementing a series of initiatives to ensure communication pathways are created and maintained for local knowledge to be incorporated before, during and after emergencies. This includes the development of a Local Knowledge Policy which sets the strategies and principles for the incorporation of local knowledge into emergency plans and an emergency response. It includes the identification of local knowledge sources within communities, VICSES units and other existing community based networks.

Community members are being identified to perform the role of community observers. Local Information Officers are also being appointed within SES units to act as a communication inter-face between community observers and community based networks. Initially VICSES is focusing on identifying community observers within locations where VICSES units do not exist.

Emergency Management founded on community participation, resilience and shared responsibility is a key principle in realising the vision of a sustainable and efficient emergency management system. VICSES is committed to ensuring local knowledge is captured before, during and after flood emergencies and considered as part of emergency planning and incident management decision making processes.

1. Introduction

Large-scale emergencies can result in causes and effects that have implications on national and international scales. No matter what the scale of emergency, communities have an enormous capacity to provide valuable locally based information about emergencies. This information is commonly referred to as local knowledge.

Local knowledge on people, history, risks, vulnerability, operational requirements, infrastructure and services significantly enhances emergency preparation, response and recovery. (Victorian Emergency Management Reform White Paper, 2012). As the control agency for floods, storms, tsunamis and earthquakes and a key support agency for other hazards in Victoria, VICSES has a leading role in ensuring local knowledge is considered across all phases of emergency management.

VICSES has 150 units located across Victoria, although in some high risk communities, VICSES does not have a presence. In these locations, the need to establish arrangements with trusted sources of local knowledge is particularly significant for VICSES to ensure it is well connected to the local community.

2. Recent reviews, inquiries, commissions and media reports

Recent reviews, inquiries and a Royal Commission following emergencies demonstrate the value of incorporating local knowledge.

2.1 Victorian Bushfire Royal Commission (2009)

The Victorian Bushfire Royal Commission (BRC) was established to investigate the causes and responses to the bushfires which affected Victoria on 7th February 2009, commonly referred to as the 'Black Saturday' fires. One of the key findings of the Royal Commission was that local knowledge was not adequately incorporated within incident management teams. The final report released by the BRC noted in Recommendation 14 that as part of the Australasian Inter-Service Incident Management (AIIMS) framework "local knowledge is incorporated in an incident management team" in the future.

2.2 Review of the 2010-11 Flood Warnings & Response (2011)

From September 2010 to March 2011, Victoria experienced some of the worst floods in the state's history (State Flood Emergency Plan, 2012). The '*Review of the 2010-11 Flood Warnings & Response*' (2011) (The Review) found that during these floods, local knowledge was used to good effect in some instances to inform decision making, however in some instances local knowledge was allegedly ignored, discounted or not used as an information source which subsequently impacted on the response.

Recommendation 22 of the Review noted the "state take the necessary measures to require that local knowledge is considered in flood-risk planning, including verification of flood maps and flood response plans" and Recommendation 93 noted that "local knowledge is considered as a critical component of all phases of emergency management."

2.3 Environment and Natural Resources Committee inquiries into flood mitigation infrastructure (2012) and rural drainage in Victoria (2013)

The Environment and Natural Resources Committee (ENRC) led an inquiry into flood mitigation infrastructure and a separate inquiry into rural drainage in Victoria following these floods.

The flood mitigation infrastructure inquiry recognised the importance of local knowledge to support not just flood monitoring but also waterway management planning. The Inquiry 'supports the utilisation of appropriately accredited and trained volunteer flood monitors in the provision of flood information.'

The rural drainage infrastructure inquiry proposed that local community drainage committees be established to provide 'local knowledge, expertise, advice and some management functions for the drainage area.'

2.4 Media reports from the 2010-11 floods in Victoria

Media reports stemming from the 2010-11 flood events in Victoria highlighted a lack of adequate warnings in some instances and pointed to a lack of connectedness between warnings provided to communities and impacts being experienced on the ground. Reporting on the January 2011 flood that affected the community of Rochester, Harris, *Bendigo Advertiser* (2011) found that water was waist deep in some locations by the time an evacuation warning was issued.

Other media reports including from the Telegraph News (2011) identified a "lack of capacity by the SES to manage and undertake flood response and also inadequate planning and preparation in some areas."

3. Historical context

3.1 Flood risk profile in Victoria

Victoria has an estimated 150,000 properties with a 1% chance of being flooded in any one year and flood risk in is considered to be the second highest risk (after bushfire) facing the state (Victoria State Emergency Service, 2012).

3.2 Complacency and the cycle of drought and flood

There is a pattern and a history of complacency regarding people's understanding of their flood risks. The Review identified Victoria's long period of drought leading up to the 2010-11 floods as leading to general complacency about the potential for flooding in Victoria. It is not the first time that a large flood event has followed a significant period of drought. Major flooding in 1916 in Northern Victoria, Gippsland and Melbourne followed a period of drought during 1914-15. Major flooding in 1946 in South West Victoria followed the World War 2 drought during the late 1930s and 1940s in South West Victoria. In 1983 major floods in Northern Victoria and South West Victoria followed a severe drought period in the early 1980s. (ABC News Online 2014, Flood Victoria website).

3.3 Source of local knowledge for floods

For the management of floods in Victoria, flood warden networks have been established and utilised in some locations for localised flood information. The Review identifies there is "no formal definition or duty statement for the role of flood wardens" in Victoria.

It is considered this lack of clarity of the role of flood wardens may have often compromised command and control arrangements in recent events. The Review provides an example of community members making decisions and authorising works including the construction of levees and ordering resources such as earthmovers for construction works without the knowledge of either the control agency's Incident Control Centre, Catchment Management Authority or the Municipal Emergency Coordination Centre.

From interviews with flood wardens since the 2010-11 flood events, it is evident that agencies with a role in managing floods need to be better engaged with existing flood warden networks. A flood warden from the Benjeroop area when interviewed approximately 6 months after the January 2011 flood said in reflection:

"I don't think this emergency was managed particularly well at all; we did get a lot of information from the SES and from Local Radio, but the most accurate information was from people on the ground ...There was times when the SES jumped the gun and released details which were incorrect which did affect procedures." Hague, C et. al. (July, 2011)

4. Addressing the challenges

4.1 VICSES Local Knowledge Policy

Through the development of a Local Knowledge Policy in October 2013, VICSES has developed a framework for local knowledge to be considered, captured and utilised before, during and after emergencies. One of the ways the policy is helping to achieve this is through the establishment of 'trusted sources' of local knowledge including existing networks and the establishment of community observer networks.

Community observers are being identified within registers and relevant emergency plans to perform a role of 'providing information and observations to assist the process of incorporating local knowledge into decision making processes.' (SES Local Knowledge Policy, 2013). VICSES is also identifying Local Information Officers (LIOs) within the VICSES units who provide a key liaison role with community observers, other sources of local knowledge and Incident Management Teams during incidents (SES Local Knowledge Policy, 2013).

SES is also committed to working with existing networks of local knowledge and identifying these networks as 'trusted sources' within relevant emergency plans. For flood emergency plans, this includes identifying networks affiliated with Melbourne Water, Water Authorities, Bureau of Meteorology, Catchment Management Authorities and Local Government and capturing existing local knowledge arrangements within emergency plans. For example, VICSES worked closely with flood wardens established in and around Kerang recently to develop the Gannawarra Shire Council Flood Emergency Plan. When reviewing the Greater Shepparton City Council Flood Emergency Plan recently, it was found that a lot of work had already commenced to identify key sources of local knowledge in and around rural communities of Congupna, Daintons, Pine Lodge, O'Keefe and Guilfus Creeks. This information will be captured within the plan and community observers identified to ensure effective arrangements

are in place for future flood emergencies in these local areas where limited flood intelligence is available.

4.2 Identifying trusted sources of local knowledge – where to start?

In its initial implementation phase of the Local Knowledge Policy, VICSES is establishing networks of community observers, where existing networks are not available to perform an equivalent function or are yet to be established. VICSES is identifying leaders within communities and people suitably positioned within communities to be community observers. There are no criteria for a suitable community observer profile and it will always be dependent on the local context. Leaders in communities however can often be representatives of government, members of police, local service clubs and the CFA.

  Upon community observers being identified within emergency plans, they are considered to be 'trusted sources' of local knowledge.

4.3 What is the role and expectation of community observers?

The Local Knowledge Policy establishes the context for the expectations and responsibilities of community observers and LIOs. Role descriptions will also become part of the suite of resources community observers are provided with during future trainings.

Principally, the functions a community observer may provide support to are:

- monitoring and reporting on observations of incidents;
- providing local advice regarding consequences of incidents;
- providing authorised information to community members where requested;

Once embedded into the emergency management sector, it is considered community observers could forge a greater role in community education activities, particularly where VICSES does not have a local unit presence, the development of local emergency plans and debriefing sessions at the completion of operational activities and exercises to test emergency plans. It is through these initiatives in particular, that greater awareness of local community-level values, planning, involvement, knowledge and skills could be realised.

4.4 Are there risks involved?

Safety of persons and personnel is the most important consideration (Local Knowledge Policy, 2013). Beyond what is current practice in communities, the VICSES local knowledge initiatives do not impose any new requirements of community observers or LIOs that would put them at risk.

The scope of the role of community observers and LIOs has been developed to enable enough flexibility to be applicable to different needs and locations and to ensure the scope of the role is limited to only what is required of the role.

It is important to note that community observers are not responsible for any operational decisions, nor able to direct operational activity, including in relation to the management of flood levees (Local Knowledge Policy, 2013).

4.5 What about training and accreditation?

VICSES is implementing the local knowledge initiatives by adopting a staged approach. At this early stage, VICSES has not provided any formal training to community observers or LIOs identified; however VICSES has sought funding to support the rollout of a formal training package to ensure these practices are embedded as a sustainable long term initiative.

It is intended that through the identification of community observers and other existing networks within emergency plans, these local sources will be considered 'trusted sources' as per the directive of the Local Knowledge Policy and as such there are no plans for community observers or LIOs to be formally accredited through VICSES.

4.6 Community education and local community involvement in flood preparedness activities

Through the implementation of the FloodSafe Programs, VICSES continues to lead community education and flood preparedness activities in partnership with key stakeholders. With local input, VICSES has developed community education material for communities at risk to help inform them of the risks they face, the actions they can take, what warnings they can expect and what the warnings mean for them in the event of a flood. Engaging with local communities in the development of these resources and gaining their valuable insights and local input supports this new approach and includes for example verification of flood maps and the development of arrangements within flood emergency plans.

4.7 Flood risks, complacency and the drought and flood cycle

Ensuring that the potential for flooding in Victoria is a well recognised risk will ensure investment in flood preparedness remains ongoing, knowledge is retained; particularly in transient populations, and that land use planning and development controls remain effective to ensure future risks from flooding are minimised. The figure below aims to portray how complacency has impacted on the effective management of the flood risks in Victoria. To avoid complacency setting in to the detriment of flood management, and the need to incorporate local knowledge into emergency management and decision making, it is considered essential to engage communities' in all aspects of flood management.

Flood / Drought Cycle

4.8 Key contributing flood related initiatives

The complexities of flood emergencies mean that there are a range of factors that contribute to a community's level of preparedness for future flood events. Incorporating local knowledge into emergency management and decision making is one of many initiatives to contribute to community preparedness for flooding. Community education, flood planning, flood warning system improvements and flood intelligence enhancements can also contribute significantly to enabling a community to achieve a greater level of flood preparedness.

4.8.1 Flood warning system improvements

In relation to flood warnings, it is recognised that there are some gaps in the stream gauge network in Victoria. The Department of Environment and Primary Industries (DEPI) have been investing in repairing damaged stream flow gauges and installing rainfall and stream flow gauges at priority locations with 50 gauge upgrades completed in 2012 (Department of Environment and Primary Industries, *FloodZoom* page, *http://www.depi.vic.gov.au/water/Floods-and-floodplains/government-flood-initiatives/floodzoom* accessed on 9th April 2014). This includes work to implement automated gauge infrastructure to reduce the reliance on manual gauge readings and improve the level of service provided to at risk communities. This critical work has the potential to reduce risks associated with people reading manual gauges, both in terms of their safety in the level of reliability of the readings.

4.8.2 Flood intelligence enhancements

DEPI is also developing a web-based flood intelligence platform to deliver an authoritative source of flood intelligence before, during and after floods. The platform will use weather forecast models, satellite observations, river gauges and hydrological

modelling. It will improve flood warning, preparedness and response activities for at-risk towns. (Department of Environment and Primary Industries, *FloodZoom* page, http://www.depi.vic.gov.au/water/Floods-and-floodplains/government-flood-initiatives/floodzoom accessed on 9th April 2014).

4.8.3   Flood emergency plans

VICSES is leading the development of Municipal Flood Emergency Plans (MFEPs) in support of Municipal Emergency Management Planning Committees. These plans are being progressively developed in areas identified as being at risk of flooding across Victoria. MFEPs provide information about probable flood consequences against river heights, flows, flood class levels and flood frequency events.

4.9 Incident Management Structures

In Victoria, the Australasian Inter-Service Incident Management System (AIIMS) is relied upon to provide direction to how Incident Management Structures are established. In 2014, AIIMS version 4 was released. A significant change from the previous version of AIIMS has been the establishment of an intelligence unit in its own right. The Intelligence function within Incident Management Structures has responsibility amongst other things for collecting, analysing and processing information. This includes information from a wide range of sources. AIIMS version 4 importantly provides the framework and direction for personnel with local knowledge to be sourced from within agencies or the community affected to provide the necessary understanding and insight to the Incident Management Team's deliberations, decisions and plans.

4.10 How does information provided by local knowledge sources get considered by Incident Management Teams?

The VICSES Local Knowledge Policy and Local Knowledge Fact Sheet detail the arrangements by which information from local knowledge sources gets considered by Incident Management Teams.

It is important to note that there is some flexibility built into these arrangements to suit a range of circumstances that could unfold during emergencies. Arrangements will be made for Community observers and other 'trusted sources' of local knowledge to have a point of contact within Incident Management Teams. It is intended that this will usually be a LIO incorporated into a sector, division command or intelligence cell. The decision of where to incorporate LIOs into the Incident Management Structure will depend on the nature and scale of the incident.

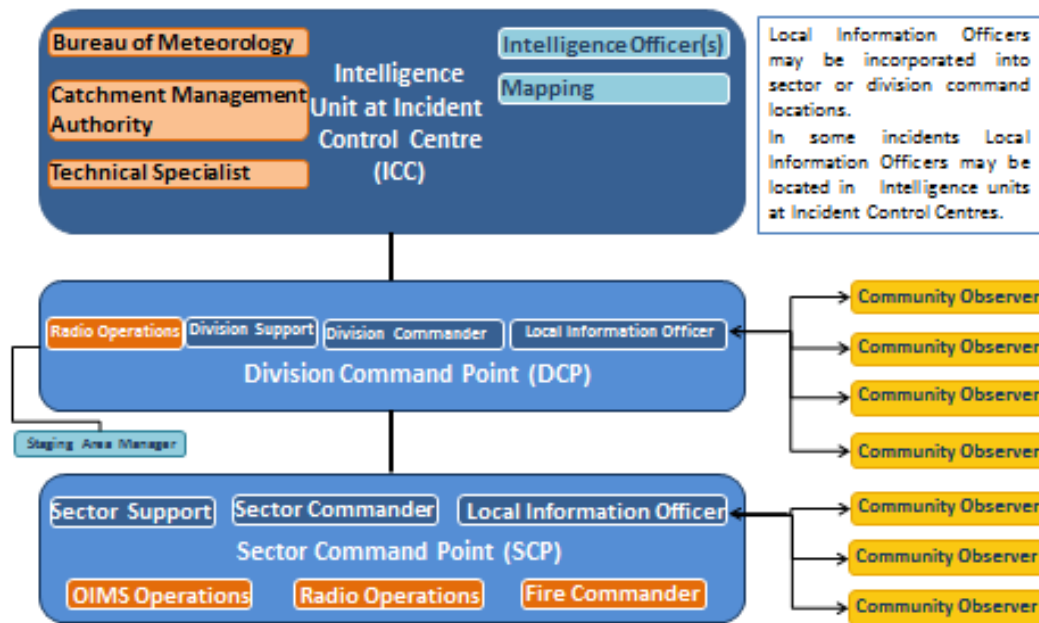A proposed incident management structure is outlined below in figure 1.

Figure 2 Proposed Incident Management Structure incorporating community observers and LIOs

5. The case for a systematic approach to ensure local knowledge helps inform decision making during response to emergencies

A systematic approach is required to ensure local knowledge is considered during response to emergencies to inform decision making.

It is proposed that a systematic approach is one that would provide:

1. Strategies and plans which adequately detail local knowledge arrangements prior to an emergency;
2. A seamless flow of information collated during the different phases of emergency management including preparedness, response and recovery;
3. Effective processes for information to be collected, processed, analysed, validated and disseminated;
4. Availability of resources with capacity to achieve points 1, 2 and 3 above.

Developing a systematic approach to incorporate local knowledge into emergency management and decision making for floods includes developing systems in the preparedness phase that help to contribute to a community's level of resilience to future floods. A systematic approach also includes clear arrangements for the incorporation of local knowledge during the response phase and enables local knowledge sources to be involved in after action de-briefs and the recovery phase.

A systematic approach is one where systems established during response to incidents have the capability and capacity to collect, process, analyse and validate information in a timely manner and then be able to use this classified information to good affect to support decision making and the provision of advice to communities at risk.

6. Limitations and complexities

The limitations and complexities of effectively incorporating local knowledge into emergency management and decision making should not be underestimated. Decision making inherently involves a mixing of science, value preferences and practical judgements about feasibility and legitimacy and outside the scientific community the realm of knowledge and evidence is even more diverse and contested. (Head, 2009). There are inherently a range of diverse views a decision maker needs to consider in emergency management. This is often accentuated during emergency response when time to adequately consider and incorporate local knowledge into decision making becomes limited.

7. Opportunities for the future

There will be many opportunities to enhance the way communication pathways are enhanced in the future. This includes consideration of technological advances such as advancements in IT systems and social media use.

There has been an alarming growth in the uptake and utilisation of smart phones. It is critical therefore that communication pathways for local knowledge consider the use of smart phones as part of the solution.

The New South Wales (NSW) Rural Fire Services have recently developed an app called 'fires near me.' This app provides fire information on bushfire incidents in NSW and allows users to access fire information that is specific to their location. The Bureau of Meteorology has recently developed a Weather Observations Website which allows users to lodge and share weather information and photos (Weather Observations Website, http://bom-wow.metoffice.gov.uk/ accessed on 11th April 2014).

New initiatives such as the 'fires near me' app and the 'weather observations website' are examples of new ways authorities are creating communication pathways with communities.

It is critical however that they are seen as only one small part of the solution. Government needs to ensure it contributes to enabling an environment where communities can participate in emergency preparedness, response and recovery activities. The bushfires in Tasmania demonstrated the value of this and the "grassroots response to the disaster proved crucial." (ABC News http://www.abc.net.au/news/2013-01-14/community-action-proved-key-in-bushfire-response/4464464 accessed on 11th April 2014). The response to the disaster included a social media campaign, set up by a resident from Hobart. The campaign helped to provide a community forum for people to provide help to those affected and helped to coordinate supplies for fire victims at the height of the disaster.

8. Future Directions – embedding the local knowledge initiatives

Future work planned to implement and embed the local knowledge initiatives into the Victorian emergency management sector is consistent with the principle set out within the National Strategy for Disaster Resilience (2011) which focuses on building "disaster resilient communities across Australia" and recognises that disaster resilience is a "shared responsibility for individuals, households, businesses and communities, as well as for governments."

Future local knowledge initiatives led by VICSES will also be consistent with any new directions provided by the new emergency management arrangements in Victoria. This includes the introduction of new legislation, the Emergency Management Act 2013 and the establishment of Emergency Management Victoria which will have a coordination role in the development of whole of government policy for emergency management and emergency management reform initiatives.

The range of initiatives undertaken to embed the local knowledge initiatives will be evaluated periodically and the effective incorporation of local knowledge into emergency management and decision making will continue to be an integral part of what is evaluated in reviews undertaken following future emergencies.

It will take considerable time for these local knowledge initiatives to be effectively implemented and embedded. However to enable an environment to exist where shared responsibility for individuals, households, businesses, communities and governments is attainable, it is considered that the sector is taking some significant steps in the right direction.

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