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Governing
During
Crises

Policy Brief No.20



Digital Government & Disaster Responses

Empowering Community-Led Recovery

18 May 2022 | Timothy Kariotis

Summary

Key Points

This Policy Brief makes the following key points:

- (a) Recent disaster responses in Australia have showcased the power of using digital technologies to crowdsource solutions and make the most of collective intelligence. For instance, in the 2022 Lismore floods in New South Wales, local community members employed social media to compile the only digital database of people needing to be rescued.
- (b) With the increasing prevalence, speed, and unpredictability of disasters, spurred on by climate change, local responses will form the cornerstone of disaster response in the years to come. Governments can provide support to empower communities to crowdsource responses using digital technologies including smartphones and social media.
- (c) The essential elements of a successful recovery process outlined by the Royal Commission into Natural Disaster Arrangements underscore the need for recovery to engage with, be led by, and reflect the needs of the community.
- (d) There are various approaches to tapping into the collective intelligence of the community during a disaster. Social media is a common tool used to source real-time information on the changing nature of a disaster and the support needed by communities. Others include open-source crowdsourcing software. Examples discussed in this brief are from Australia, Kenya, and the USA.
- (e) However, there are many barriers to using digitally enabled collective intelligence and crowdsourcing, including the digital divide, infrastructure, and the acceptance of collective intelligence by disaster agencies. Effective policy needs to be crafted to overcome these barriers.

Recommendations

This Policy Brief makes the following recommendations:

- (a) **Digital capability uplift:** Support is needed for the 40% of Australians who struggle to keep abreast of technological developments, and to address the needs of specific communities with diverse access to, and usage of, digital technology.
- (b) **Designing digital platforms:** Digital platforms need to be carefully designed e.g. using existing apps effectively, ensuring they can function offline until connected to WIFI and do not use large amounts of data, and taking account of the common loss of identity documents in disasters.
- (c) **Government as a Platform (GaaP):** Government can also play a key role in providing the building blocks on which community-driven platforms can be built, and avoiding problems arising where private platforms are the only option for collective action (e.g. hampering donations). Existing digital infrastructure (e.g. 'digital twins' of urban landscapes) can also be more fully leveraged.
- (d) **Acceptance of collective intelligence and government leadership:** Governments can be both a user and an enabler of collective intelligence. The increasing role of digital platforms in society and disaster response calls for leadership in establishing standards to ensure platforms can integrate into broader disaster response systems and that different agencies know how to engage with crowdsourced information and resources appropriately.

Digital Government & Disaster Responses

Empowering Community-Led Recovery

1. Introduction

As local community members took their boats out into flooded Lismore to save their neighbours, local business owner Sally Flannery used social media to compile the only digital database of people needing to be rescued. With the increasing prevalence, speed, and unpredictability of disasters, spurred on by climate change, these local responses will form the cornerstone of disaster response in the years to come.

These examples showcase the power of crowd-sourcing and collective intelligence. Increasingly, the use of technologies such as the internet, smartphones, and social media is amplifying the power of local community action and knowledge. With the support of governments, collective intelligence could improve the broader disaster response and feed into long-term community resilience. Drawing on and enabling the strengths of local communities also aligns with the finding from The Royal Commission into Natural Disaster Arrangements “that individuals and communities want to be empowered to manage their own recovery through access to practical assistance.”

This policy brief addresses the need for policy change to overcome key barriers in this space.

2. Disaster Response in Australia

The climate crisis contributes to an increasing number of disasters facing the Australian community each year. From floods to fires, every jurisdiction has experienced extreme weather events in the past several years, and these events are predicted to become more regular and intense. Beyond preparation and adaptation, Australia requires a robust disaster response and recovery strategy to ensure that lives and livelihoods can be saved, salvaged, and repaired post-disaster.

Disaster operations include an initial response stage and a long-term recovery stage. Disaster response and recovery don't start after the disaster, but before as communities and agencies prepare and plan for disasters. Increasingly, it is being recognised that communities should be supported to 'build back better' to ensure resilience for future disasters.

The Royal Commission into Natural Disaster Arrangements in discussing the need for a resilient nation outlined that we need to “build the capacity of communities to prepare for, adapt to, and recover from disasters.” Emergency Manage-

With the increasing prevalence, speed, and unpredictability of disasters, spurred on by climate change, local responses will form the cornerstone of disaster response in the years to come. Governments can provide support to empower communities to crowdsource responses using digital technologies.

The six elements of a successful recovery process outlined by the Royal Commission into Natural Disaster Arrangements reflect the need for recovery to engage with, be led by, and reflect the needs of the community.

ment Victoria has developed a Resilient Recovery Strategy with four strategic priorities:

1. Deliver people and community-centred recovery;
2. Strengthen recovery through better emergency management planning;
3. Streamlined and flexible recovery system;
4. Support the recovery workforce.

In the Australian context, the responsibility for disaster response and recovery is shared across all levels of government and with non-government organisations and community groups. The local government usually leads the long-term recovery with the support of other agencies at the State and Federal levels and NGOs. This approach provides a tailored response to local communities while introducing significant complexity. This complexity can negatively impact communities trying to navigate the various agencies and services operating in the disaster response ecosystem.

The Royal Commission into Natural Disaster Arrangements outlined six elements of a successful recovery process:

- **Context:** understand the context of the community;
- **Complexity:** recognise the complex and dynamic nature of natural disasters and the communities that they have impacted;
- **Community:** use community-led approaches that are responsive and flexible, and that engage communities and empower them to move forward;
- **Continual assessment:** ensure a planned, coordinated and adaptive approach is used, based on continuing assessment of impacts and needs;
- **Communication:** ensure effective communication with affected communities and other stakeholders; and
- **Capacity:** recognise, support and build on community, individual and organisational capacity.

These elements reflect the need for recovery to engage with, be led by, and reflect the needs of the community. Figure 1 from the Royal Commission (see p.9 below) outlined the recovery cycle. Digital technology can be used to tap into the power of community and enable collective intelligence and action that can support disaster response and recovery.

3. Crowdsourcing & Collective Intelligence

There are various terms used to describe the power of the crowd. In this brief, the terms ‘crowdsourcing’ and ‘collective intelligence’ are used. Crowdsourcing in the context of disaster response has been defined as the “voluntary online engagement of heterogeneous groups, individuals, institutions, non-profit organizations, and companies who bring different knowledge and skills to disaster response”.

Collective intelligence reflects the improved decision-making potential that comes from using crowdsourcing methods. Evidence suggests that crowdsourcing can enable self-organisation of different stakeholders in the disaster response process that allows stakeholders to adapt to changing circumstances through improved communication between stakeholders and access to real-time information.

One pertinent example of how crowdsourcing enables self-organisation is the use of online platforms by protestors in Hong Kong to evade police and plan their action without an identified leader.

4. Examples of Crowdsourcing & Collective Intelligence

There are various approaches to tapping into the crowd during a disaster. Social media is a common tool used to source real-time information on the changing nature of a disaster and the support

needed by communities (See below). Social media can also be used to support the recovery of communities by sourcing much-needed resources such as accommodation. There are also various crowdsourcing platforms that can be adopted by communities to seek resources and information.

- **Australia: Find a Bed initiative**

The 2020 Victorian bushfires saw the establishment of the community-led [Find a Bed](#) initiative on Twitter which helped people affected by the bushfires find a place to stay.

- **Australia: Emergency Situation Awareness (ESA) tool:**

Social media data can be an important information source for tracking disasters. The Commonwealth Scientific and Industrial Research Organisation ([CSIRO](#)) has developed the Emergency Situation Awareness (ESA) tool, which monitors social media in real-time across Australia and New Zealand.

Drawing on real-time social media data can provide valuable insights into fast-moving disasters. The use of social media data is well documented as providing valuable information for disaster response. Some of the [challenges](#) in using social media data are evaluating its [accuracy](#), integrating it with other disaster response information and presenting it appropriately to different stakeholders (e.g. government agencies versus community members).

- **Kenya: election violence tracker**

Information can also be sourced directly from the community to inform the disaster response and recovery. [Ushahidi](#) is an online crowdsourcing platform developed in Kenya to track acts of violence during the turmoil that followed the 2008 election. Ushahidi started as a people-powered WordPress blog where data was collected via email and text and mapped onto Google Maps.

It has [evolved](#) into an open-source software application used in 106 countries. The platform has been used in various countries to capture data on a range of crises to aid recovery responses. The platform draws data from a range of sources, including social media, chatbots, SMS, surveys and email, collated using tagging, keywords, and geolocations, presented on a dashboard that allows for exploration and mapping of the data. This is an example of [crisis mapping](#) which involves the real-time gathering of data from various sources during a crisis that is mapped using a platform specifically designed for this purpose.

- **USA: Crowdsourc Rescue**

Technology can also connect people in need of support to those who can provide it. [Crowdsourc Rescue](#) was established in the U.S to help rescue people in need by them to both professional first-responders and volunteers. An example of how the system is used is by community groups helping connect elderly community members with a rescuer before a disaster event.

5. Barriers to Digitally Enabled Collective Intelligence

There are various barriers to using digitally enabled collective intelligence and crowdsourcing, including the digital divide, infrastructure and the acceptance of collective intelligence by disaster agencies.

- **Technology skills and access:** The pandemic led to more people being connected to the internet. [One recent report](#) indicates the number of people offline dropped from 10% to 1%. However, less than 40% of Australians feel they can keep up with changes in technology. There are also many nuances in how different groups use technology, their

There are various barriers to using digitally enabled collective intelligence and crowdsourcing, including the digital divide, infrastructure and the acceptance of collective intelligence by disaster agencies.

capabilities to engage online, and access to digital resources such as high-data mobile plans. Thus, when we think about the possibilities of using digital technology to crowdsource information and action, we need to be aware that some people will be missing from these crowds, and they will usually be the most vulnerable in disasters.

- **Access to power and phone signal:** As we saw with the recent flooding events in NSW and QLD, large swathes of communities had no access to power and no phone signal. Many people may have also lost devices or other digital resources during the floods, impacting their ability to engage on digital platforms. When considering government-run digital services that may require identification (e.g. MyGov), we must also consider the challenges posed when identity documents may have been lost during a disaster.

These two barriers require action on digital capability uplift and infrastructure upgrades in disaster-prone areas.

However, we can also build technology to take into account these barriers. We can design crowdsourcing platforms to be simple, accessible and easy to use – such as allowing people to use applications they already use to contribute information.

For example, if people can interact with a crowdsourcing system using SMS, Facebook Messenger or WhatsApp, this may reduce the cognitive load required to learn a new application. At the same time designing platforms that can function offline until connected to WIFI and that do not use large amounts of data can enable the use of these technologies in areas with inconsistent WIFI or for people with low-data phone plans.

Government agencies can lag behind other disaster response stakeholders (e.g. NGOs) in engaging with crowdsourcing for a variety of reasons, including issues around privacy and security, organisational and policy limitations, resourcing, credibility of crowdsourced information and risks posed by potential bias due to the digital divide.

These issues appear to occur when governments are engaging with already established platforms or crowdsourcing initiatives. If governments took a leadership role in enabling these approaches and establish policy settings that supported collective intelligence some of these issues may be addressed.

6. The Role for Governments

Governments can be both a user and an enabler of collective intelligence. The increasing role of digital platforms in society and disaster response calls for someone to lead the way in establishing standards to ensure platforms can integrate into broader disaster response systems and that different agencies know how to engage with crowdsourced information and resources appropriately.

The Royal Commission into Natural Disaster Arrangements outlined the need to improve disaster-related data and information including the following opportunities:

- Improved access to information and data sharing;
- Improved capability of existing institutions/tools to provide data and/or research;
- Improved data capabilities;
- Improved national data consistency;

Governments can be both a user and an enabler of collective intelligence. The increasing role of digital platforms in society and disaster response calls for leadership in establishing standards to ensure platforms can integrate into broader disaster response systems and that different agencies know how to engage with crowdsourced information and resources appropriately.

- Improve community messaging and warning; and
- Improved availability of data to emergency services.

Any projects to leverage these opportunities should consider integrating with community data from social media and crowdsourcing platforms. Governments should also look to lift the digital and data capability of communities and improve the two-way information sharing between community and agencies in disaster responses.

Governments could also act as the supplier of digital platforms to communities to use in disaster response and recovery. These platforms could have a variety of functions that primarily benefit the community and allow for data to be collected that can support different agencies' response and recovery efforts. For example, suppose a platform allows people to upload photos of damaged houses for other people to check the status of their property. In that case, agencies could also use this data to map damaged areas.

Even better than governments supplying the specific software, website or technology for collective intelligence, is the provision of platforms upon which community-driven platforms can be built. The idea of Government as a Platform (GaaP) where government acts as a computer operating system which communities can build their collective action on using building blocks provided by government.

For example, if you're a community group that wants to organize donations during a disaster you have to use a private platform which may make it hard to distribute the funds to different groups. Imagine if government provided a payment system pre-built for disaster scenarios that communities could build on for their own specific needs. Similarly, governments are increasing creating digital twins of their urban landscapes which provide rich datasets on the built and natural environment. In a disaster citizens could contribute crowdsourced data to the digital twin to produce rich maps of disaster areas to tailor response efforts.

There is also a bigger question to be asked about the role of governments during a disaster. Serious questions were raised during the Lismore floods about the speed and scale of the response by the government. Crowdsourcing and collective intelligence is not a replacement for a significant

government response. Instead, it supplements an official response and feeds into a cycle of resilience as communities establish networks of support and intelligence to mitigate future disasters.

7. Conclusion

The climate crisis will lead to more disaster events across Australia. Strengthening the community response is key to 'building back better' and supporting community resilience.

Recent events have seen the natural emergency of crowdsourcing and collective intelligence out of necessity. However, the power of the crowd can be enabled and harnessed in a way that supports the broader disaster response and contributes to community resilience.

Like many opportunities and issues raised by new technologies governments risk playing catch-up and having others define this space. Governments can and should play an enabling role for communities to develop collective intelligence. Providing the infrastructure and resources for collective action could contribute to the bigger picture of disaster resilience.

Strengthening the community response is key to 'building back better' and supporting community resilience. Like many opportunities and issues raised by new technologies governments risk playing catch-up and having others define this space. Governments can and should play an enabling role for communities to develop collective intelligence.

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Figures

Figure 1 The disaster recovery cycle

Source: Royal Commission into National Natural Disaster Arrangements Report. October 2020 ([link](#))

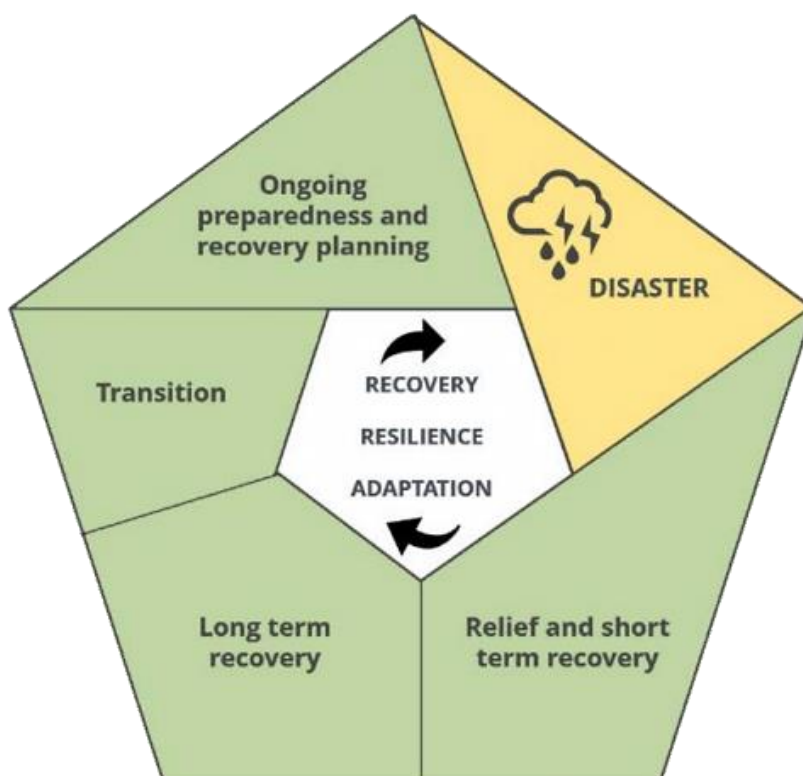
Figure 1 from the final report of the Royal Commission into National Natural Disaster Arrangements outlines the recovery cycle. At each point of the cycle digital technology can tap into and enable collective intelligence and action can support disaster response and recovery. The report describes each phase of the cycle as follows:

Ongoing preparedness and recovery planning: the development of a whole-of-community approach to mitigate the effects and manage the consequences of an emergency or disaster. Recovery planning covers both planning as part of ongoing preparedness for events and also event specific recovery plan(s) to facilitate recovery from disasters.

Relief and short-term recovery: the period during and immediately after an event (hours to weeks), including: rapid impact assessment, early relief and emergency assistance, recovery needs assessment, and short-term planning. This phase may occur in parallel to the response to a disaster.

Long-term recovery: medium to long-term recovery efforts, ranging from several months to many years. This phase includes community engagement, rebuilding, and renewal programs and projects. Some elements of this phase will continue until well after the affected community is able to manage on its own.

Transition: the progressive handover to 'business as usual'. The transition stage identifies lessons and implements improvements to increase resilience as part of recovery processes and planning moving forward.



Governing During Crises Series

Governing During Crises is a research theme established by the School of Government at the University of Melbourne. The series seeks to develop our understanding of governing in the face of different types of crisis, at a time when Australia has recently faced the bushfire crisis, is currently addressing the COVID-19 pandemic, and faces even larger and longer-term challenges including climate change.

This Policy Brief series aims to distil academic research into policy analysis and clear recommendations, drawing on the cutting-edge research taking place at the School of Government and the University of Melbourne more broadly, as well as the School of Government's extensive global networks. Selected briefs will be produced in collaboration with the COVID-DEM project (www.democratic-decay.org), which examines how the pandemic is affecting democracy in Australia and worldwide.



Author

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Tim comes from a digital health background and is currently in the final year of a PhD in digital health. He has published extensively on the design of electronic health records and health data governance. Tim is also involved in projects on healthcare sustainability, AI ethics and inclusive design.

Tim is also the lead organiser of the Digital Government Festival: see details above.

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