



Queensland University of Technology
Brisbane Australia

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Howes, Michael, [Grant-Smith, Deanna](#), Reis, Kim, Bosomworth, Karyn, Tangney, Peter, Heazle, Michael, McEvoy, Darryn, & Burton, Paul (2013) Public policy, disaster risk management and climate change adaptation. In *2013 Public Policy Network Conference*, 24-25 January 2013, University of Queensland, St Lucia, QLD.

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Public policy, disaster risk management and climate change adaptation

Paper submitted to the 2013 Public Policy Network Conference, 24-25 January, Brisbane.

Category: full paper, peer reviewed

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Abstract

Public policymakers are caught in a dilemma: there is a growing list of urgent issues to address, at the same time that public expenditure is being cut. Adding to this dilemma is a system of government designed in the 19th century and competing theories of policymaking dating back to the 1950s. The interlinked problems of disaster risk management and climate change adaptation are cases in point. As the climate changes, there will be more frequent, intense and/or prolonged disasters such as floods and bushfires. Clearly a well integrated whole of government response is needed, but how might this be achieved? Further, how could academic research contribute to resolving this dilemma in a way that would produce something of theoretical interest as well as practical outcomes for policymakers? These are the questions addressed by our research via a comparative analysis of the 2009 Victorian bushfires, the 2011 Perth Hills bushfires, and the 2011 Brisbane floods. Our findings suggest that there is a need to: improve community engagement and communication; refocus attention on resilience; improve interagency communication and collaboration; and, develop institutional arrangements that support continual improvement and policy learning. These findings have implications for all areas of public policy theory and practice.

Introduction

Over the last decade a series of major droughts, bushfires, cyclones, storms and floods have placed both disaster risk management and climate change adaptation firmly on the public policy agenda. As the climate changes further, it is predicted that the number of these weather-related disasters will increase in intensity, duration, and/or frequency (IPCC 2012). What is therefore needed is an integrated response across all levels of government that makes the best use of scarce public resources. The problem is how to achieve this integration in an environment where: (1) public expenditure is being reduced; and, (2) there are strong and growing claims from other policy areas that compete for scarce public resources (particularly with regards to healthcare, education, and welfare). In a nutshell, the research problem boils down to a common dilemma: is it possible to find a more coherent way for governments to do more with less?

This paper addresses this problem using the findings of a research project entitled: *The Right Tool for the Job: Achieving climate change adaptation outcomes through improved disaster management policies, planning and risk management strategies*. This project aimed to develop the foundations for an integrated approach to disaster risk management and climate change adaptation. The research was undertaken by a team from Griffith University and RMIT University over one year (2012) that was funded by the National Climate Change Adaptation Research Facility (NCCARF). The research centred on a comparative case study of the 2009 Victorian bushfires, the 2011 Perth Hills bushfires, and the 2011 Brisbane floods. The first stage of the project was a literature review that provided the relevant overview of disaster risk management arrangements and climate change adaptation policies in Australia. Stage two was an analysis of the official inquiry reports into each of the three case study disasters to identify common themes. Next, a series of semi-structured interviews were conducted with 22 key stakeholders in Perth, Melbourne and Brisbane, to examine these themes in more detail and develop proposals for change. Finally, three workshops were held

(one in each city) with a broader range of 26 practitioners and stakeholders drawn from both the public and community sectors to review the proposals and identify any gaps.

1) The nature of the problem

The best available science indicates that the climate is changing and there will be significant environmental, economic and social impacts as a consequence. The environmental impacts include rising temperatures, increases in sea levels, greater coastal erosion, changing precipitation patterns, reductions in ice and snow cover, loss of habitat, accelerated species extinction, and an increase in the frequency, duration and/or intensity of weather-related events such as cyclones, storms, floods, heatwaves, droughts and bushfires. The economic impacts will include the loss of agricultural production, increased damage to built assets, higher insurance costs, greater defensive infrastructure costs, and more resources spent on emergency responses. Finally, the social impacts will include higher mortality and injury rates, damage to homes, the loss of livelihoods, a decrease in fresh water availability, an increase in food scarcity, a rise in the number of displaced people, and an increased risk of conflict (IPCC 2007, 2012; Royal Society 2010; AAS 2010; NOAA 2011; Stern 2005).

Australia is particularly vulnerable to the impacts of climate change because of its geography, economy and settlement patterns. Although it is difficult to accurately predict local impacts, the long term trend is for the majority of the temperate south to get drier and the tropical north to get wetter. For the south this means a significant reduction in crop production, more pressure on water supplies, and the increased risk of bushfires. For the tropics, it means increased risks from storms and cyclones. As most of the major population centres in Australia are located on the coast, they will face a higher risk of inundation and coastal erosion. Further, the likelihood of more frequent, extreme and prolonged heatwaves will increase the rate of mortality, particularly amongst the elderly and the ill (IPCC 2007b, 2012; CSIRO 2010; Garnaut 2011).

Some examples of what is to come might be drawn from recent history. The 2011 Queensland floods demonstrated what happens when there is a deluge in catchment areas that feed into major cities and towns, while the 2009 Victorian bushfires and 2011 Perth Hills bushfires revealed the increased fire risk from prolonged dry periods. It should be noted, however, that climate scientists are reluctant to attribute specific events such as these to climate change. Floods, droughts and bushfires have always been a part of the Australian environment, but these kinds of events are likely to increase because of climate change (IPCC 2012; QFCI 2012 & 2011; GWA 2011; VBRC 2010). The argument put forward here is simply that because climate change is linked to disaster risk management through these weather-related events, an integrated and improved response to both is needed.

The complex and far reaching nature of climate change has led many to label it a ‘wicked’ policy problem (APSC 2007; Head 2008; Rittel & Weber 1973) and some have even gone so far as to call it ‘diabolical’ (Garnaut 2008). The concept of wicked problems was developed by Rittel and Weber (1973) who gave them ten attributes:

1. They are difficult to define;
2. There is no end or boundary to the problem;
3. There is no agreed criteria to judge the correctness of a response;
4. Responses have unforeseen consequences;
5. Responses that go wrong cannot be easily undone;
6. It is not possible to identify all response options;

7. There is no suitable precedent to guide decision makers;
8. There is a strong interconnection with other problems;
9. There is no agreed explanation of the cause or the seriousness of the problem; and,
10. Mistakes in either action or inaction are very costly.

While climate change clearly exhibits these attributes, it is interesting to ask whether the move to classify them as ‘wicked’ might also be an indictment of the limitations of existing systems of government.

Because climate change has significant public policy implications from the international through to the national, state and local levels of government, it cannot be handled by a single agency or portfolio (Howes & Dedekorkut-Howes 2012; Ross & Dovers 2008). Further, the link between climate change and extreme weather-related disasters requires an integrated response. The prevailing institutional structures and policymaking processes, however, may create significant barriers in developing an effective, efficient and appropriate response (Althaus, Bridgman & Davis 2007; Howes 2005; Toyne 1994; Beck 1992).

2) The institutional context

Beck (1992) pointed out that the main institutions of modern government were created in the nineteenth century and were not designed to address current complex environmental issues. The oldest environmental agencies only date back to the early 1970s, and climate change organisations did not emerge until the late 1980s (Howes 2005).

The Australian system of government is a case in point. It was shaped by a constitution drafted in the 1890s by a group of independent colonies that were reluctant to cede power to a new national government. The result was a compromise that blended institutions from the USA and UK into what is sometimes referred to as the ‘Washminster mutation’ (named after the governments of Washington and Westminster) (Jaensch 1997; Thompson 1980). Local Governments were not mentioned in the constitution and exist entirely at the mercy of State Governments that were formed from the pre-existing colonies (Howes & Dedekorkut-Howes 2012). Climate change and disaster risk management were simply not on the political agenda when these institutions were created, so there is no mention of them in the constitution.

The underlying dynamic of the Australian political system is an on-going vertical power struggle between the three tiers of government. This has been particularly fierce when it comes to complex issues related to the environment that cut across local, state and national boundaries (Ross & Dovers 2008; Howes 2005; Toyne 1994). There have, however, been some moves to improve collaboration between levels through the Council of Australian Governments (COAG) and a range of joint councils (Howes & Dedekorkut-Howes 2012).

In addition to these vertical power struggles, there have been corresponding horizontal rivalries between different organisations within each level. Governments have traditionally divided up their responsibilities into discrete areas, such as emergency services, the environment, public health, housing, infrastructure, business, agriculture, etc. This strict demarcation has led to a ‘silo mentality’ within organisations that encourages a narrow view of issues within their purview and tends to overlook the broader or cross-agency implications. Furthermore, there is the risk of ‘turf wars’ as responsibilities and resources are jealously guarded and other organisations are seen as competitors (Liebrecht & Howes 2006). These kinds of rivalries are exacerbated by issues that necessarily cut across the defined areas of responsibility such as climate change and disaster risk management (Productivity

Commission 2012; APSC 2007). A flood or a bushfire, for example, will have implications not only for the emergency services that need to provide the immediate response, but will also require the intervention of other government organisations to provide health care, housing, financial assistance, and repairs to infrastructure. In recent years there have been moves to improve cooperation and coordination in Queensland, for example, at the regional level, with joint bodies being established between various agencies and local government to coordinate the delivery of services (Rolfe, et al. 2009; Howes 2006). This was extended by the creation of the Queensland Reconstruction Authority after the 2011 Queensland floods.

3) Policymaking processes

While the governing institutions at the heart of the Australian political system set the stage, the policymaking processes within them direct the behaviour of the actors. These processes have a strong formal component that is embodied in public sector rules and procedures but there is some debate as to how they might best be described. Perhaps the most popular view is that of the 'policy cycle' which characterises policymaking as a series of logical steps: issue identification; policy analysis; policy instruments; consultation; coordination; decision; implementation; and, evaluation. At the end of the evaluation step, any issues that are revealed or remain unresolved start the next turn of the cycle (Althaus, Bridgman & Davis 2007). Critics of this view argue that policymaking is not as logical or clear cut and point out that even the proponents of this model have admitted that it is more of an ideal than a definitive explanation of practice (Colebatch 2005). The idea of a logical step by step process remains influential in many policies, plans and decision-making routines. The prevailing model of prevent, prepare, respond and recover (PPRR) in disaster risk management is a good example.

Notwithstanding the attraction of the policy cycle, one of the ongoing debates is whether the process should proceed via giant leaps (the rational comprehensive school) or small steps (incrementalism). The rational comprehensive approach conceives policymaking as rational, balanced, objective and analytical process in which decisions are made in a series of stages starting with identification of the problem or issue and ending with the implementation of a solution. The approach advocated by this model implies that all possible options are considered in detail and that one alternative is chosen over others entirely on merit, thus effectively discounting the influence of political and other external factors (Productivity Commission 2012). Critics of the rational comprehensive approach consider it to be based on an unrealistic ideal, noting that such comprehensiveness is rarely possible in practice, sufficient information is often not available, and 'solving' policy problems may be a fantasy; in practice, problems are redefined, insufficiently addressed or re-emerge (Handmer & Dovers 2007; Sutton 1999). There have also been criticisms of the step-wise approach and of the assumption that policy formulation and implementation can be separated (Heazle 2010; Bell 2002; Neiman & Stambough 1998; Sutton 1999). What if a problem is not easy to define? What if there are clashing goals and objectives? What if policymakers are not aware of all the options available? What if the costs and benefits cannot easily or accurately be calculated? What if policymakers and planners are influenced by factors such as ideas, economic interests, political ideology, discourses or values and so fail to optimise the cost-benefit ratio?

Incrementalism, the main competitor to the rational comprehensive model, was proposed in the 1950s by researchers such as Charles Lindblom who acknowledged that policymakers have to deal with imperfect or incomplete information about issues and options (Lindblom

1979). He believed that democratic systems tend to resist radical change and that a strategy of incremental change through small steps could allow policy makers to address parts of larger problems using familiar tools and drawing on their past experience. Critics of this theory argue that such an approach makes substantial improvements to society impossible, but Lindblom suggested that over time these steps could build into significant changes. While this view of policymaking is perhaps more realistic than the rational comprehensive model, it is less than optimal and does not provide a strategic way forward because it only considers a small number of alternatives for dealing with a problem and tends to choose options that differ only marginally from existing policies (Handmer & Dovers 2007). For each alternative only the most important consequences are considered. There is no optimal policy decision as the focus is on small changes. It relies on constant improvement and review to identify and address policy problems.

Attempts to avoid the pitfalls of both the rational comprehensive and incremental models have given rise to hybrid approaches that propose an iterative or sequential approach to policy development and implementation (Dror 1964). This approach has the capacity to adopt an institutional learning cycle that draws on the on-the-ground knowledge of key stakeholders to drive policy changes. Indeed it has been suggested that responding to problems like climate change require such a sequential or iterative decision-making approach because it allows “decisions to be made and revised repeatedly over time in response to new knowledge, accumulated experience, or changed conditions” (Parson & Karwat 2011:744). This might include new scientific knowledge about climate change and associated impacts, changes in technologies, or changes in goals and priorities.

Although complex interlinked issues like climate change and disaster risk management appear at face value to be well suited to rational comprehensive policymaking the uncertainty inherent in the knowledge of local risks and the clash of values renders this model unworkable in practice (Heazle 2010). On the other hand, the issues and challenges are so pressing that their resolution requires more rapid and substantial changes than an incremental approach can deliver. Perhaps, therefore, the best hope lies in the adoption of a sequential, iterative approach – something that might even be characterised as Bayesian policymaking. Questions remain, however, on how such an approach might cope with uncertainty, the clash of values, and whether it can deliver the needed changes in time.

4) Current climate change adaptation policies

The preceding sections have elucidated three elements of the policy problem. First, climate change has profound policy implications for Australia, particularly with regards to adaptation and has been characterised as a ‘wicked’ problem. Second, although an integrated response is needed to both climate change and disaster risk management, the Australian institutional context discourages collaboration across and within levels of government. Third, there remains considerable disagreement about whether the policymaking process can generate the scale and speed of change required. All three elements have manifest themselves in current responses to climate change adaptation.

The *National Climate Change Adaptation Framework* (COAG 2007) is the touchstone for coordinating climate policy across the three levels of government in Australia. It was developed by COAG in 2007 to improve understanding of the problem, build adaptive capacity and reduce vulnerability. This led to the creation of the *National Climate Change Research Facility* and identified priority areas of action in: water resources; coastal regions;

biodiversity; agriculture, fisheries and forestry; human health; tourism; settlements, infrastructure and planning; and, natural disaster management.

In 2009 the Australian Department of Climate Change (DCC) released *Climate Change Risks to Australia's Coasts: A first pass national assessment* (DCC 2009) that provided all levels of government with some indication of the key risks to coastal settlements. This was followed in 2010 by the Commonwealth's *Adapting to Climate Change in Australia: An Australian Government Position Paper* (DCC 2010) acknowledging that responsibility for adaptation is shared by all levels of government, business and the community. While the Commonwealth saw itself as playing a leading role in some areas, it was made clear that most of the heavy lifting would have to be done by the other levels of governments.

In 2011 the Productivity Commission investigated the barriers to climate change adaptation at the request of the Commonwealth government. This resulted in the release of an *Issues Paper* (Productivity Commission 2011) followed by a *Draft Report* (Productivity Commission 2012), both of which saw climate change as a market failure and stressed the need for market solutions. In 2011 the Commonwealth created the Climate Commission to inform the public debate about climate change through a series of reports.

At the state level, climate change adaptation policies and plans are in a state of flux. In October 2012, for example, the Western Australian government released a new policy statement entitled *Adapting to Our Changing Climate* (GWA 2012) that showed how rainfall in the south-west of the state had declined since 1950 and discussed bushfire prevention, early warning, control and defence. The Victorian Government is required by its *Climate Change Act 2010* to develop a *Climate Change Adaptation Plan* every four years and the first one was due at the end of 2012. While Queensland developed some climate change policies that dealt with adaptation under the Bligh government, (including *ClimateQ: Toward a Greener Queensland* and the *Draft South East Queensland Climate Change Management Plan*) these policies were never fully implemented and the election of the Newman government in 2012 shifted the policy focus away from climate change (Norman 2012).

At the local government level, the DCC ran a *Local Adaptation Pathways Program* in 2008 that provided grants to local councils for developing their own adaptation plans (the list of participating councils included several from Western Australia, Victoria and Queensland). In addition, eighty seven local councils in Australia are members of the network of International Councils for Local Environmental Initiatives (ICLEI) Local Governments for Sustainability that has several voluntary programs on climate change adaptation (ICLEI 2012). As with state governments, policies and plans at the local level are in a state of flux (Norman 2012). The Gold Coast City Council, for example, had developed a *Climate Change Strategy* that included adaptation in 2009 but by late 2012 it was considering making cuts to its climate change department (Killoran 2012).

5) Current disaster risk management arrangements

Australia has an array of legislation, organisations, financial instruments, and coordination mechanisms designed to manage disasters that include multi-tiered institutional arrangements and formal coordination forums (World Bank & QRA 2011:11). In general these arrangements, along with a high coping capacity (primarily a function of income, savings and insurance), ensure that although disaster events may cause extensive damage, mortality rates are generally low and communities are able to recover relatively quickly (O'Brien, O'Keefe,

Rose & Wisner 2006:66). The challenge is how the system will cope in future as climate change increases the frequency and or intensity of disasters caused by extreme weather events (IPCC 2012; Productivity Commission 2012).

There have been considerable efforts to improve collaboration between agencies and develop a more consistent national response amongst the different levels of government. COAG has again played a key role supported by the joint ministerial *Standing Committee on Police and Emergency Management* and the *National Emergency Management Committee* (that is made up of the Directors-General of the relevant departments) and its sub-committees (comprising officers from the key agencies).

The Commonwealth, through the Attorney-General's Department and *Emergency Management Australia*, seeks to facilitate a national approach to disaster risk management by maintaining a constructive dialogue between the states and territories on issues of national importance (EMA 2000; Pitman 2006). This has encouraged the adoption of an all hazards, all agencies, and prepared community approach to disaster risk management as well as the standard PPRR policymaking model. Two key policies used by all governments are the *Australian Emergency Management Handbook and Manuals* and the *National Emergency Risk Assessment Guidelines* (NERAG). Funding can be sourced from the *National Disaster Resilience Program* and the *National Disaster Response and Recovery Arrangements*.

In Queensland there is the *Queensland State Disaster Management Plan* (2010), the *Disaster Management Act 2003* and *Public Safety Preservation Act 1986*. Coordination is handled by the State Disaster Management Group (comprised of state departmental Directors-General) with three subgroups dealing with disaster coordination, recovery and mitigation respectively. In the aftermath of the severe flooding in 2010-11 and cyclone Yasi in February 2011, the Queensland Reconstruction Authority was established to coordinate and implement recovery efforts. In Western Australia, the Fire and Emergency Services Authority (FESA) is the lead agency and operates under the Western Australian Emergency Management Policy. In the aftermath of the Perth Hills bushfires, FESA is being restructured into a department. Victoria has its own Emergency Management Act 1986 and Emergency Management Manual Victoria. The lead agency was the Office of the Emergency Services Commissioner but in December of 2012 it was announced that a new coordinating body, Emergency Management Victoria, would be created (Government of Victoria 2012).

At the local level, councils have an important role to play in disaster planning and response but many have limited capacity to deal with major disasters without the support of state agencies. The Queensland government has District Disaster Management Groups and Local Disaster Management Groups to coordinate efforts at the local and sub-regional level. Similar arrangements operate in Western Australia. Relationships between the state and local governments in Victoria are currently being reviewed.

6) Case studies: the findings of the official inquiries

Despite these developments, question remains about how well this array of policies, processes and institutions will cope with the impacts of climate change, particularly with regards to the increasing demands on disaster risk management. Three recent natural disasters offer some useful insights: the 2009 Victorian bushfires; the 2011 Perth Hills bushfires; and, the 2011 Brisbane floods. A comparative analysis of the official inquiries into these disasters has been matched against more general research in the area to produce four proposals. First,

there is a need to improve community engagement and communication. Second, there is a need to refocus attention on resilience. Third, there is a need to improve interagency communication and collaboration. Finally, there is a need to develop institutional arrangements that support continual improvement and policy learning. These proposals should help to address the problems discussed in the previous sections of this paper. Further, they may provide key points for developing an integrated response to disaster risk management and climate change adaptation.

In terms of community engagement and communication, responding to issues such as disaster risk management and climate change adaptation requires a whole of government approach that necessarily relies on a willingness to work across agency boundaries and with the community and business at the local level (Productivity Commission 2012; APSC 2007). Goode, et al. (2011) note that there is scope for improvement in community engagement particularly with respect to clearly communicating risks and hazards. Our own analysis of the 2009 Victorian Bushfires Royal Commission (VBRC) bore this finding out with the Commission's report making repeated references to the need for better community engagement and communication appearing in its reports (VBRC 2010c: 3, 31, 34, 37, 230, 352). Similarly, the report into the 2011 Perth Hills bushfires extended these concepts to include the notion of shared responsibility for disaster risk management across sectors (GWA 2011: 13, 46). The need for improvements to community engagement and communication also featured prominently in the Queensland Floods Commission of Inquiry (QFCI) final report with regard to improving community preparedness and assisting local groups with disaster risk management (QFCI 2012: 118, 122). In short, a sound communication and engagement strategy is needed to enable well-informed communities to participate in their own adaptation and risk management.

With regard to refocussing on resilience, traditionally disaster risk management has followed the PPRR policymaking model. Although this approach has been very useful for emergency management organisations to plan their work, it has been suggested that PPRR creates artificial barriers between the elements of risk management and a more proactive approach may be better suited to the challenges at hand (Handmer, et al. 2011; Rogers 2011). Introducing the goal of building community resilience as a central component of PPRR might allow for a more integrated and pro-active approach. One of the problems identified in all three disaster inquiries was the lack of consensus on the definition of resilience (VBRC 2010:31, 34, 230; GWA 2011: 13, 46; QFCI 2011: 115, 118, 122). The task is therefore to adopt a "holistic approach" which generates a "common understanding that is robust enough to operate in different policy contexts" (Prosser & Peter 2010:10-11). If both disaster risk management and climate change adaptation policies can develop this common understanding, then opportunities for policy integration and enhancing community resilience to the threats of climate change and natural disasters should become apparent and be more easily pursued.

On the point of improving interagency communication and collaboration, there is a growing awareness that top-down, hierarchical, command-and-control approaches to policymaking are being increasingly challenged by more collaborative, flexible and networked models of governance (Waugh & Streib 2006). This is certainly the case in Australia where disaster risk management arrangements depend on interagency and intergovernmental actions as well as working together with volunteers, non-government organisations, businesses and the community. Of course there are still improvements to be made. The Victorian Bushfire Royal Commission found that there the "operational response was hindered by difference between agencies' systems, processes and procedures" (VBRC 2010a:18) and "true integration was

not achieved” (VBRC 2010a: 8). Communication and coordination problems were also cited as problems in both the Brisbane floods and Perth Hills bushfires inquiries (QFCI 2011: 115; GWA 2010: 133). In their consideration of these same disaster events Goode, et al. (2011) noted that each agency has its own specialised knowledge in relation to specific risks and that there is insufficient shared understanding between these silos of knowledge. All three inquiries highlighted the need to clarify roles and responsibilities, to coordinate actions better, and for improved leadership arrangements to enhance interagency communication. Effective interagency communication and collaboration is essential for a delivering a coordinated all hazards, all agency approach as advocated by Emergency Management Australia and State Governments. Improved networking, cooperation, collaboration and cooperation has the potential to deliver a range of benefits in both a disaster management and climate change context relating to the building of inter-agency trust, improved information exchange, collaborative decision making, risk sharing and pooling limited resources to achieve common goals. These points also apply equally to climate change adaptation and other areas of environmental policy (Ross & Dovers 2008).

Finally, regarding the need for institutional arrangements that support continual improvement and policy learning, all government organisations have to respond to rapidly changing economic, social and environmental contexts. As a consequence they need to redesign their structures and procedures to be more flexible and adaptable, and to enable continual improvement and policy learning. The Victorian Bushfires Royal Commission (2010c: 81, 86, 229) promoted the need for agencies to learn from their experiences and to conduct more research into the level and distribution of risk. The Perth Hills bushfire report recommended a new set of institutional reviews, education and training (GWA 2011: 188), while the Brisbane floods inquiry recommended improving hydrodynamic modelling and forecasting to improve decision making (QFCI 2011: 24, 62). Goode, et al. (2011) note that each of these inquiries also highlight a number of institutional issues associated with state emergency management arrangements. Part of the solution to these challenges requires innovative, comprehensive solutions that can be modified in the light of experience and on-the-ground feedback (ASPC 2007: Waugh & Streib 2006). Successfully tackling these problems requires a broad acceptance and understanding, including from governments, that there are no quick fixes and that levels of uncertainty around the solutions need to be tolerated. In order to be effective disaster risk management and climate adaptation need to be integrated into mainstream government operations and each other. Furthermore, approaches require continuous review to encourage policy learning and improvement. Institutional arrangements which support this may include integrating climate adaptation into all phases of PPRR (Birkmann & von Teichman 2010).

7) Findings on the implementation of change

The four themes outlined above were explored in more detail through semi-structured interviews with key stakeholders in Western Australia, Victoria and Queensland (where the three case studies were located). Most of the participants were public sector workers involved in disaster risk management and a few were involved in climate change policymaking. Their positions ranged from on-the-ground officers to senior executives. The interviews confirmed what had emerged from the literature review and inquiry report analysis and produced some practical proposals for change. These interview findings were then used to guide a series of three workshops (one each in Perth, Melbourne and Brisbane) with a broader range of stakeholders that included community organisations and an expanded range of public sector workers from a wider variety of agencies. These workshops acted as a peer-review process to

test the practicality of the proposals for reform, identify issues that may have been overlooked, and generate new insights and proposals.

7.1) Community engagement: Local community resilience grants

Two key points that emerged from this research are: (1) the key role that local governments have to play in both climate change adaptation and disaster risk management; and, (2) the need for a sense of shared responsibility where the community and business take action to improve their own resilience. One way to address both these points could be through the development of a local community resilience grants scheme. The idea is that each council would set aside a small amount of their budget, (perhaps only a couple of hundred thousand dollars would be necessary) and advertise for the community to come up with proposals for simple projects that could improve local resilience to disasters (such as floods and fires) and climate change. (One project, for example, might be to establish a network of volunteers who would take responsibility for ensuring that a particular group of vulnerable elderly people got to safety during an emergency). Selecting and prioritising successful projects could then be done via a popular vote by residents at a town or ward meeting. The advantage of this proposal would be to encourage concrete improvements in resilience, raise community awareness about their vulnerability, and create a sense of ownership of, and support for, proposals for change.

This proposal was discussed at the workshops and generally endorsed. There were some concerns, however, about whether the broader community was convinced of the need to take action on climate change. Further, the question of whether there was a suitable level of awareness of the vulnerability to disasters such as floods and bushfires was also raised. Finally, there was the view that some sections of the community might feel that this kind of action could be left to the government. These concerns suggest that there would need to be an accompanying public education and community engagement program, focussing on climate change adaptation and disaster risk management.

Many local governments already offer community grants programs. Some grants are used to fund local volunteer groups (such as surf life saving) while others fund small nature conservation projects and community centres. Implementation of this proposal could simply involve a combination of any or all of the following changes: the creation a new category of grants; redirecting some of the existing money into projects which are specifically focussed on building local resilience; recognising the impact that existing programs have on increasing resilience; modifying existing programs to enhance their contribution to community resilience; and, changing decision making mechanisms to allow for a popular vote.

7.2) Focus on resilience: a shared policy vision

Although the use of the concept resilience has become increasingly prevalent in the emergency management sector in Australian in recent years (Handmer, et al. 2011) the inquiry reports demonstrate a lack of consensus on the definition of resilience in the disaster setting (VBRC 2010:31, 34, 230; GWA 2011:13, 46; QFCI 2011:115, 118, 122). The finding is supported by the work of Goode, et al. (2011:20). This consistent with other policy domains, including climate adaptation, in which there is there is no clarity or shared vision around “what resilience means, beyond the simple assumption that it is good to be resilient” (Davoudi 2012:299). Our participants agreed that while

“there's about 45 definitions of resilience... in general terms you're wanting a community that...isn't totally flattened or permanently destroyed...[and has] some sort of capability and capacity to rebuild and keep going” (Victorian government official 8).

However, in terms of developing a shared vision, all agencies need to agree on ‘the big picture’ and focus on their ‘higher order purpose’. This would require some agreement on common goals, such as improving community safety and resilience. There would also need to be some recognition of the complementary role of each agency in contributing to the achievement of these common goals and a commitment to this shared vision by the relevant executive officers and Ministers to implement a consistent set of cross-government standards. This would include developing a shared understanding of the full range of relative risks and vulnerabilities for a given community so that agreed actions can be prioritised. Both climate change and disaster risk management, as well as their inherent uncertainties, would need to be integrated into this strategic thinking.

“It's not about one hazard. It can't be one hazard. It can't be one. Climate change is not going to be just about fire or whatever. It's got to be then - everyone's got to focus on emergency management. It's no longer just the fire service or the flood agency to think of it. It's an all government, local government responsibility. Whether it be [the] education department, transport department or primary industry, everyone should have an understanding of what it means to them. So it's across every part of government. And all of their partners. If Red Cross is a partner to DHS? They've got to understand their role, and what they do and how they do it.” (Victorian government official 4)

Certainly, there are already a range of international and national strategic documents which seek to provide a framework for addressing disaster response arrangements and climate change. It should be noted, however, that there have been attempts to develop a shared vision for these kinds of cross-cutting and strategic issues on a national scale in the past. The Hawke government developed the *National Strategy for Ecologically Sustainable Development* in 1992 after two years of extensive consultation between all levels of government, business and the community. Subsequently, the Howard government's *Environment Protection and Biodiversity Conservation Act 1999* required all Commonwealth departments and agencies to report to parliament annually on their contribution to sustainability (Howes 2005). The Rudd government revisited the concept as part of the *Australia 2020 Summit* in 2008 that again brought all sectors of society together to agree on a shared set of goals. Despite these efforts Australia remains a long way from sustainability and this example demonstrates the need for well coordinated policy and institutional changes to support and implement the shared vision (Howes 2008; Ross & Dovers 2008). So developing a shared vision is an important first step, but the reforms must go further to ensure the consistent and effective achievement of that vision.

7.3) Inter-agency collaboration: cooperative funding

Traditionally all three levels of government have funded specific departments or agencies and their associated programs. This may encourage competition for funds between agencies and levels of government and discourage collaboration. What if part of the pool of public funding was set aside and attached to resolving particular problems? What if agencies were encouraged to form consortiums across all levels of government as well as with the private

and community sectors in order to bid for these funds? This could create a tangible financial incentive that encourages multi-level, inter-agency collaboration, as well as cross-sector partnerships (hence sharing the responsibility with business and the community). Some of the issues to which the funding could be attached could include finding ways to build resilience to a range of natural disasters (such as floods and bushfires) and climate change.

This proposal was raised for discussion at all three workshops and generally got a favourable response. There were some concerns, however, about the amount of time that would be taken up in applying for funding and undertaking project reporting, and the uncertainty around whether a project may get approval. Other concerns included: the need to ensure that the approach gave adequate consideration to local and contextual issues; that it was seen as a complement to existing programs; and, that it did not prevent agencies from delivering their 'core services'.

In terms of practicality, there are already precedents for this approach to funding. Landcare grants have been operating for over two decades, allowing local community groups, government agencies, and businesses to bid for funding to rehabilitate various local environments. More recently, the National Climate Change Adaptation Facility (which funds our project) offers grants to research specific problems that are bid for by consortiums of different universities, research organisations and government agencies. Although all levels of government are currently attempting to rein in spending, this proposal could simply be an expansion of the existing *Natural Disaster Resilience Program* grants scheme that is run under partnership agreements between the State and Commonwealth governments. Further, there are funds in the *Caring for Our Country* program (that includes Landcare) and *Infrastructure Australia* (that encourages public-private partnerships). Finally, COAG is currently reviewing its funding of *National Partnership Agreements*, so this may be an opportune time to try this proposal.

7.4) Institutional learning: embedded researchers

The need for the emergency management workforce to understand the implications of climate change for disaster risk management emerged as a recurring theme throughout this project. It was a need recognised by a broad cross-section of senior executives, officers on the ground, volunteers, and community groups. The problem is that climate science is complex and there are a lot of uncertainties in trying to delineate impacts at the local level. One proposal that we put forwards was to embed climate researchers within emergency management organisations so that they can and work with staff on developing a shared understanding of the risks as well as redirect their research into areas of shared priority. This would be a two-way exchange and the researchers would also learn about the process of disaster risk management. Ideally they would have regular contact with front-line troops to improve their understanding of the shifting risk profile, as well as senior levels of management to help them see the big picture and recognise their shared objectives with other agencies.

This idea was discussed at the workshops and received some qualified support. There were some concerns about how these researchers could be funded, who they would answer to, their ability to remain independent, and whether there would be some sensitivity if their research outputs might be construed as critical of the host organisation.

There are a several options for addressing these concerns. Some large agencies already have a research department, so adding a climate expert would fit easily into existing structures.

Other agencies might not have this capacity but could potentially engage in ongoing partnerships with organisations that have the required expertise. Finally, there is the option of forming a consortium to research and learn about a specific threat. This might draw on existing funding such as the *Australian Research Council Linkage Grant* scheme or perhaps the kind of funds provided by proposal one on collaborative funding.

7.5) Other organisational changes

A number of different organisational change strategies were promoted during this project that could be knitted together to form a coherent package for improvement. Starting at the top, COAG will need to play a key role in ensuring all levels of government are working towards an integrated approach to disaster risk management and climate change adaptation. It has already made a move towards a nationally consistent approach in both these areas (e.g. with the *National Climate Change Adaptation Framework* and the *National Emergency Risk Assessment Guidelines*) supported by the relevant Ministerial and departmental committees (see section 4). What is needed now is to reorganise existing committees and agreements into a more coherent whole. This also needs to be done at the state level of government in order to generate a consistent executive commitment to improving resilience.

The next change would be to create new, and revamp existing, interagency senior officers groups to translate the executive commitment into day-to-day management changes within their respective agencies. Finally, a network of ‘champions’ should be created across all agencies that involves staff who will look for ways to implement adaptation measures and provide points of inter-agency collaboration. These champions could be selected on the basis of their interpersonal skills, enthusiasm, and willingness to develop long-term working relationships with staff in other agencies. They would also form working partnerships with business and community organisations.

These ideas emerged from the interviews and participants in the workshops. Several participants talked about examples of where some of these changes had happened on a small scale but they emphasised the need for both a top down commitment, and a bottom up enthusiasm, for change. A recurring theme was the need to build social capital within and between organisations. The point was also made that staff need clear guidelines to decide when to collaborate and when to go it alone, as collective action requires a considerable investment of time and resources.

Conclusions

Climate change has been labelled as a ‘wicked’ policy problem because it is difficult to define, has complicated consequences and requires a whole of government response. One of its impacts is to increase the frequency, duration and/or intensity of disasters such as floods and bushfires. What is therefore needed is an integrated policy response to both climate change adaptation and disaster risk management.

This project has addressed this problem using a comparative case study of the 2009 Victorian bushfires, the 2011 Perth Hills bushfires, and the 2011 Brisbane floods. It started with a literature review and analysis of the inquiry reports into these events then moved on to interviews and workshops with the relevant key stakeholders. Four key proposals emerged to improve: community engagement and communication; a renewed focus on resilience; interagency communication and collaboration; and, institutional improvement and learning.

These themes are starting points for improving disaster risk management and integrating it with climate change adaptation.

Proposals for practical changes were developed and reviewed that address the proposed reforms. First, local community resilience grants could raise public awareness about local vulnerabilities and lead to some practical improvements in resilience. Second, developing a shared policy vision of resilience as a goal would act as a useful compass to guide decision making at all levels. Third, providing cooperative funding for the resolution of specific issues would encourage agencies at all levels to work in partnership with each other, business and the community. Fourth, embedding climate researchers in disaster risk management agencies would help these organisations to learn about the implications of climate change for their work and help them develop a shared goal of improving resilience. Finally, several simple organisational changes would improve networking across all sectors.

All of these changes could be achieved within existing funding constraints and would enable the public sector to integrate disaster risk management with climate adaptation policies at all levels. Hence governments can find a more coherent way to do more with less.

Acknowledgement

The research on which this paper is based comes from a project entitled: *The Right Tool for the Job: Achieving climate change adaptation outcomes through improved disaster management policies, planning and risk management strategies*. This work was carried out with financial support from the Australian Government (Department of Climate Change and Energy Efficiency) and the National Climate Change Adaptation Research Facility. The views expressed herein are not necessarily the views of the Commonwealth and the Commonwealth does not accept responsibility for any information or advice contained herein. Further support was given by the Urban Research Program at Griffith University, RMIT University, and the Queensland Department of Community Safety.

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