

# Reframing risk, hazards, disasters, and daily life: A report of research into local<sup>1</sup> appreciation of risks and threats

By Philip Buckle<sup>2</sup>, Graham Marsh and Sydney Smale\*

This paper introduces a series of research projects in which we have been engaged examining a number of issues related to contemporary disaster management since 1999 (Marsh, Smale, and Buckle 1999; Buckle, Marsh, and Smale 2001a, 2001b, 2002). These research projects, supported by our own agencies and Emergency Management Australia, have at their core an examination of the concepts of community, localness, risk, hazard, vulnerability, and resilience and everyday life.<sup>3</sup> The results of completed research projects are available either from the authors, from the Department of Human Services (DHS) or from Emergency Management Australia (EMA). All documents are available on request by email to P.D.Buckle@rmcs.cranfield.ac.uk.

However, acknowledging the centrality of these concepts, there are two caveats. First, while there is agreement on how these terms are defined, there is often not a good understanding of the internal structure, mechanisms, and dynamics of these concepts. For example, there is agreement that community is a core disaster management (DM) concept, but whether in practice this refers to issues such as community as locality, community as interest group, or community as demographic group (gender or age, for example) is often not clear. Second, the linkages and interactions between these core

concepts are not well understood, either. How do communities (however defined) define and deal with risk?; how does risk translate to vulnerability (or vice versa)?; and, how are resilience and vulnerability linked or dependent (if they are)?

In the first research project (Marsh et al. 1999), for the Department of Human Services, we worked to identify which groups in the community were especially vulnerable.<sup>4</sup> In our second research project, conducted for EMA, we talked with local people across Victoria about the perception and understanding of disaster, hazard, risk, and vulnerability among agencies and communities. In our third project, also for EMA, we asked the question of local agencies and municipalities, why they frequently did not use the documents, guidelines, and resources used to encourage, support, and direct risk, vulnerability and resilience assessments. In our current project, also for EMA, we are trying to identify and describe any linkages that may exist at municipal and local levels between community capacity building and DM capability. This last project is being managed using a comparative method using case studies in Australia and the United Kingdom.

## Background

Disaster management in Australia and in other locations within the developed and developing worlds is in the process of moving from a hazard management paradigm (where the focus of policy and program attention is on

\* The authors have collaborated on a number of research activities, teaching programs, consultancies, and operational matters over the past five years. These activities have been, and continue to be, across Australia, the United Kingdom, and the United States.

1. In this context, local refers to individuals or small groups that are not professional disaster managers and that are active at the municipal level or lower levels of social organization.
2. At the start of this research program Philip Buckle was the Manager, State Emergency Recovery Unit in the Department of Human Services, Victoria, Australia; he is now Academic Leader, Cranfield Disaster Management Centre in the United Kingdom.
3. Each of these core concepts has its definition, or in some cases many definitions, and we do not propose to review them here. We generally accept the definitions given in the glossary prepared by Emergency Management Australia as working definitions. All we need to observe at this point is that these concepts are central to current thinking in disaster management (DM).
4. Prior to clear and resolved definition of terms, the everyday use of language (which often has agreed-upon definitions which have very fuzzy boundaries) seems to force us into this perceived and sometimes actual circularity of expression.

management of the perceived hazard agent), though a risk management paradigm (where efforts are directed more comprehensively to both hazards and impacts and to the development of strategies that may be directed at a range of mitigation, response, and recovery options) through to (so we would argue) a consequence management paradigm where effort and attention is directed at putting greater emphasis on understanding, prioritising, and dealing with the full range of consequences. These are not fully logically consistent or exclusive categories, but public administration is as much about achieving results as it is about intellectual coherence.

As part of this movement through a series of management paradigms there has been an increasing understanding and acceptance of the concepts of risk, vulnerability, and resilience, but especially there has been an increasing acknowledgement of community right to be engaged in the DM process and of the contribution that the community can make to DM policy and practice. This critical development has been driven in part by the political process of community activation, in part by an increasing emphasis on rights and participation as key elements in DM thinking and practice, and partly by the direct experience that community engagement is an indispensable tool in effective management and policy development. Nonetheless, there is still not a good understanding on the part of disaster managers of the significance and meaning that these concepts and of the realities they have for local people.

### Origin of the studies

In June 1998 there were major floods in East Gippsland, a remote and sparsely populated rural area in eastern Victoria. These floods confronted the local community and the recovery management team with particular problems. An economic, environmental, and social context which include severe drought in the years up to and including 1998, recent Ovine Johanes disease, a downturn in agricultural commodity markets as well as a diverse population – aging farmers in the hinterland, retirees along the coast, urban populations in the east of the municipality – combined to make this a unique situation. Understanding the context, vulnerabilities, and capacities of the affected population took some time even after it was recognised that we were not dealing with a homogeneous population.

Three months later an industrial accident at Victoria's only domestic and industrial gas processing plant, run by Esso in Gippsland, left 1.8 million households out of a total number of about 2.1 million without gas. Again the significance of this loss was not immediately perceived. The focus of attention was on managing the fire at the damaged processing plant, but over a few days it became obvious that maintaining critical facilities

such as hospitals reliant on gas for heating, laundry, sterilising, and other critical functions was of equal need. Further, it rapidly became apparent that, apart from industrial needs for plants and commercial activities dependent on gas for industrial processes, cooking, and the like, there was a very vulnerable population that itself was diverse. Two hundred people on gas-powered life support systems, people receiving palliative care, the incontinent and new born babies requiring washing facilities, the frail elderly needing heating, and people with skin disorders requiring regular and frequent bathing were among the groups of people dependent on gas.

These events prompted an increasing awareness of the diversity of groups at risk and of the range of vulnerabilities. With this improving knowledge, work began early in 1999 to prepare for any possible Y2K disruption. Although no significant events occurred in the transition to the new millennium, the work in preparedness, risk assessment, community consultation, and vulnerability analysis was profitable in that it incisively informed the planning process for other disaster potentialities.

This work paid dividends in better informing preparedness and risk reduction activities, not just for 'traditional' natural disasters such as windstorms and wildfires, but also for widespread, socially disruptive, and potentially disastrous events such as electricity supply disruption. In Victoria, electricity generation is now privatised, and it appears that private companies may have little economic incentive to provide the safety net margin of productive capacity that existed when ownership of utilities was in public hands. As a result, at times of peak demand (during hot days in summer when air conditioners exact a heavy toll on the available electricity supply), 'brown-outs' and in some conditions actual power outages may occur. This has necessitated the development of sophisticated schedules for the reduction in use of electricity and, in parallel, the development of exemption criteria for groups most at risk in circumstances where power is not available.

### Method

The studies we are discussing form a deliberate succession: first an analysis of vulnerability and risk appreciation, second an analysis of why risk and vulnerability assessment tools are or are not used, and third how community capability to manage disasters can be improved. However, given the absence of a robust and rigorous body of knowledge and theory about these concepts and issues, our work has been in part exploratory, in part speculative, to identify key issues and to stimulate debate on these critical subjects. The methods we have used have reflected the priority we have given to exploration and (initial) description as precursors to analysis and theory building, and we

recognise their limitations while also acknowledging that they have been appropriate for the current state of knowledge.

Each study has been started with an exhaustive review of the literature. Many people have contributed to an improved understanding of the issues, but no one, in our view, has developed models that link risk, vulnerability, resilience and day-to-day life in a coherent and puissant framework, nor have any analytical frameworks or models emerged that have managed to deal with the complex interactions of daily life, risk management, and disaster management in ways which allow for the linkage and integration of these issues between individual, group, community and system levels. Of course, at local levels where the focus will be on discrete groups such as family units, clans, and tribes or geographically defined communities, this may not matter. But for policy development at regional, state, and national levels, a coherent framework is an imperative.

Following the literature review we employed a variety of methods, each with their strengths and weaknesses but each able to help in the triangulation process.

Employing a grounded theory approach of recursive examination, development, and refinement of knowledge and query and framed within an interpretivist method, we began first with a modified Delphi technique calling upon experts in the field of disaster management to provide their views. Some experts were interviewed individually, others as part of a group. We employed a structured approach to interviews and then, as the interview progressed, moved into a semistructured approach. Interviews and group meetings were repeated with some key informants. These experts were drawn from public administration, encompassing areas of policy formulation, program development, disaster management, and planning, as well as from comparable areas in municipal government and also from the academic world in Australia, the United Kingdom, the United States, and Canada.

Participant observation was another technique that we employed, although infrequently given that our research interest focused on local people and municipal officers rather than agency officers with whom we interacted on a daily basis but to whom we were known. We conducted a series of focus groups in ten municipalities across Victoria. These municipalities included rural, urban/rural fringe, and metropolitan municipalities with these subdivided into those that had recent experience of disasters and those that had no recent experience. We also used a case study method and looked at a number of municipalities that had recent experience of significant disasters.

## **Research findings from project 1: Assessment of community impacts**

This project set out to identify and describe the groups of people most at risk from major utility disruption, but took into account also vulnerability to natural disasters. We acknowledged that certain groups of people, such as the elderly, disabled, and very young, might be particularly at risk. These groups, as we acknowledged, are traditionally thought of as being vulnerable. We identified a range of other groups who might also be at particular risk. These included the homeless, those without existing resources, travellers and tourists, as well as people who have been affected by the events (emergent vulnerabilities).

It is not entirely trite to say that we are all vulnerable in particular ways in specific circumstances, although it may be a blunt instrument for policy development. However, it is the case that we are all vulnerable to a range of events, and we are all vulnerable in a range of ways, including loss of life, injury, loss of home, and loss of livelihood, and trauma.

We indicated in this report, which by its brief was exploratory and descriptive, that vulnerability is contingent not only upon the inherent characteristics of the subject but also on the local circumstances. In this sense vulnerability (and with it the related concepts of risk and resilience) is relative, not simply in the sense that each person or social entity is vulnerable in different ways but that vulnerability varies across time, space, and activity.

## **Research findings from project 2: Assessment of personal and community**

### **Resilience and vulnerability**

The results from our first study, local appreciation of risks and disasters, surprised us but were not inconsistent with much sociological research into choice, risk perception, and the 'overheads' of everyday life. It was clear from our discussions and interviews with local people that their appreciation of risks and hazards was clearly disparate with the assessment of DM professionals. The risks associated with hazards such as fire and flood were demonstrably of less significance than threats associated with the practicalities of navigating a course through daily life. No one underestimated the potential of hazards such as wildfire to disrupt life and health. But given their low probability, particularly relative to the likelihood of the risks of maintaining a mortgage, managing children's education, and sustaining a healthy, vibrant community and environment, they scored low compared with more mundane (as assessed by DM professionals) risks.

It was particularly important that local people took a much more strategic approach to risk assessment than

did DM professionals. Local people looked to the horizon to see demographic changes, changes to the environment, changes to farming and business practices, and the loss of young people to large urban centres as the critical issues in risk and safety management. Local people saw the underlying structure to their risk environment, whereas DM professionals saw topical issues and risks and failed to see the social and economic determinants of safety and sustainable living. Of course, agencies and their staff are invariably constrained by their mandate to focus on particular issues and risks, and this leaves them unable to focus on others.

### **Sense of place, history and context**

On reflection it may be no surprise that local people had a sense of place as a geographic area, but also as a social space defined by a set of values and shared aspirations. This is linked to a sense of history, most strongly in rural areas where population changes are least, and if not of a sense of communal destiny, of a feeling for a direction in community development. This is paralleled by a sense of contemporary activity such as recent and continuing economic trends, demographic trends (particularly immigration and emigration from the area), and activities that harm or sustain the natural environment.

### **Sense of daily life**

Within the broader context of purposeful and often driven direction, people had a pragmatic appreciation of the exigencies, labours, and rewards of daily life. The necessity of meeting mortgage payments, managing children's education, sustaining a social life, and other equally necessary but often mundane activities set the contemporary context in which attention to risks from natural and nonnatural hazards was merely another activity to be managed in sustaining family and community life.

### **Local hopes and fears**

Daily life and its maintenance provide a foreground to life, but they are intertwined and coloured by hopes, aspirations, and fears about the future and about the realisation of personal, family, and community goals. These hopes and fears are the counterbalance to the practicalities of day-to-day existence, and as such they provide the goals for which people aim. Missing the target was not seen to be significantly affected by hazards and disasters. Broader social and economic processes were felt to have more influence on desired futures. These issues therefore formed and set the boundary to the context in which local people understand hazards and disasters.

### **Local understanding of hazards and risks**

Local people had an understanding of hazards to which they and their communities are exposed that was sophisticated and comprehensive. They understood

better than agencies the range of hazards to which they are exposed and also the potential outcomes (risks) to which they were exposed when confronted by the hazard agents. In particular, they had a more comprehensive understating of environmental hazards and risks to farming and economic processes than did agencies. Local people understood that environmental, social, and economic processes work over decades and generations and that, while particular outcomes may not be predicted, it is possible to foresee that profound structural changes may occur to the community when exposed to the tides of long-term processes.

### **Local changes: thresholds and rates of change**

It became clear in our meetings and discussions with local people that change was often discontinuous and unpredictable. For example, local sporting clubs can survive (more or less) down to a critical point which is usually the minimum number of players to field a team. Once membership falls below this critical number, the club disappears. In a sense, therefore, the club exists and functions, or it does not exist. There is no middle ground, no gray area, and no ambiguity. Local capacity is affected by this step-like approach to change.

### **Local changes: predictability of outcomes**

Linked to the notion of thresholds is the issue of predictability. Numerous changes have consequences that are not easily foreseeable. For instance, a scheme to buy back land from flood-affected farmers assisted farmers with cash and finances for their future, but it removed people from the local community as they moved off to the coast or large cities for retirement. This weakened the local community and further reduced its coping capacity. This is particularly the case with population reduction, which reduces the pool of people available to provide volunteer services. The rural fire services, rural emergency services, and support services depend almost entirely on local volunteers. Any measure which encourages people to move away (and often this encouragement is given with altruistic intent) weakens the local community.

### **Significance of losses**

The losses to which people and communities are exposed range from the loss of physical infrastructure, through material assets such as houses, through intangible losses such as mementoes and memorabilia as well as health and safety, through to intangible or even indefinable losses such as loss of community, loss of trust, loss of hope, and loss of peace of mind. These intangible, irreversible, and uninsurable losses are held by most local people to be more important than the loss of physical, material items that may be replaced. Replacement, of course, comes at a financial cost, but it is achievable.

### **Significance of disasters**

Disasters as periodic but unpredictable events were acknowledged by local people to be potentially serious, but the implicit risk assessment they carried out suggested that the risk (as a function of probability and severity of consequence) was generally less than that of more probable but, for any particular occurrence, less important event.

### **Divergence of agency and local priorities**

The conclusions suggested from the results indicated above showed that agencies, mandated by legislation, government policy, political expediency, and agency tradition, had a different view of hazards and risks to local people and to local communities. This is not intended to either denigrate or devalue the agency assessment, but rather to point out that this divergence exists and must be accounted for in policy development and planning if disaster management is to be effective.

### **Issues for disaster management**

The issues that were identified by this project that are most relevant for more effective disaster management, and in particular for disaster management that is responsive to community needs and priorities, are:

**Remoteness and Communications.** The absence of easy access to services and to elected representatives and the absence or access only to intermittent services that are dependable was a recurrent theme.

**Youth and Community Futures.** The future of local communities, faced with the fact of the emigration of young people to large metropolitan centres, was frequently expressed concern for rural areas. This emigration in the long term threatened community viability and in the short-term reduced the capacity to deal with hazards and risks by reducing the number of available volunteers for fire and other emergency services.

**Change to Society and Environment.** Other social changes, such as the perceived (but often incorrect) assumption of immigration of new types of people, an aging population, net emigration, and other changes, as well as changes to the environment through changed agricultural practice, tree plantations using new species, and other developments reduced the capacity to rely on existing and traditional methods of risk reduction.

**Change to the Local Economic Base.** Rural economic decline in both absolute terms (though perhaps occasioned by social developments such as an aging population) and in relative terms when compared to the increasing dominance of large urban centres reduced the capacity of rural communities to manage hazards and risks in ways that they thought appropriate and in ways that allowed them to deal with new and emerging threats.

**Thresholds.** Our research also suggested that social capacity may not decline linearly but may decline in a step-like manner, and that this loss of capacity may not be easy to foresee. For example, sports clubs and church congregations are likely to have levels (well above zero members) below which they are not viable, but the demarcation line between viability and irreversible and rapid or immediate collapse is very thin and may not be apparent before the event.

**Local Capacity.** Ability to manage hazards and risks is critically dependent on local capacity in areas of resources (including personnel), skills, and knowledge. Local people were inventive in tailoring existing capacities and in developing new strategies and methods, but the eventual success of long-term effectiveness was ultimately dependent on local capacity; this was often reported to be in accelerating decline.

**Long-Term Development.** Social, economic, and environmental development was recognised by local communities (and is increasingly being acknowledged by disaster management agencies) as central to the building of capacity but also to the reduction of risk through incorporating mitigation into development, betterment into infrastructure projects to reduce their vulnerability to identified impact thresholds, and to incorporating sustainability into the fabric of community life.

### **Research findings from project 3: Assessing the implementation of community resilience and vulnerability analysis**

This project focused on an assessment of whether various materials (such as videos, pamphlets, and guidelines) and training programs on disaster management planning (and weighted towards recovery planning) and vulnerability and resilience assessment had had any effect, whether this effect was positive or negative, and in any case (positive, no effect, or negative) why this was. The focus of this study was on municipal officers but also included regional officers from government agencies and nongovernmental organisations.

Our study concluded that the various products individually had had little influence on planning activities. Cumulatively, they had contributed over time to a general awareness of the need for risk and vulnerability assessment. The manifest issues are set out below.

#### **Confusing definitions: vulnerability and disaster**

It was clear that municipal and regional officers were not clear about the defined meanings of key terms as these were used by central agency staff or by the research community. This confusion over meanings and

significance attenuated the message that such concepts are central to understanding disaster causation and remedy.

### **Time and resource constraints**

Although it appears mundane (and perhaps even trivial), this factor in the low uptake of risk and vulnerability assessment (and the low responsiveness to supporting material) was pivotal. Most officers are too busy and many commented that over recent years they have become significantly busier. This has led them to focus on management by crisis (dealing with issues as they approach a deadline or point of failure) or to focus on meeting legislative requirements first. Both these positions are dictated by necessity, often by legal requirements, and both seem quite rational, purposive, and efficacious in the face of insufficient resources and time to do all tasks. Given that disasters are infrequent and improbable events, it is comprehensible that priority resources are directed at frequent and foreseeable threats even if they are individually of less import. Of course, the cumulative impact of many day-to-day events if poorly managed may exceed the impact of rare but large-scale disasters. This issue in particular tied in with the finding from our previous research that day-to-day life usually takes precedence over spectacular but infrequent events.

### **Existing data sources**

Counterbalancing the general inability or reluctance to undertake risk and vulnerability assessment (though there was a common agreement that in themselves these were worthy activities) was the capacity of municipal and agency managers to draw upon existing knowledge bases, data sources, and practices and to rapidly meld these into vulnerability assessments in real time. When an event occurred or seemed imminent, staff had access to information that could with some precision identify groups at risk and local capacities. This capacity drew heavily on the competence and professionalism managers and their staff, but seemed a capacity that was shared by all the municipalities and agencies with which we met. This real time assessment is not ideal, especially as the ability to make the assessment may be affected by the impact itself, but it went some way in practical terms to ameliorating the absence of forward planning.

### **Dealing with uncertainty and improbability**

Managers and their agencies are often not comfortable dealing with uncertainty. This applies in many different ways to disasters, which may be characterised as events with a high inherent uncertainty. The lack of definite boundaries (what is or is not an emergency or disaster), the lack of predictability of occurrence, the uncertainty about location, size, and extent, and the contingent uncertainty about appropriate meliorative activity acted as inhibitors to agency staff. Planning for the definite even if the planning process is complex is more

desirable and more easily accepted cognitively and emotionally than planning for the improbable. Issues for Disaster Management

Managing Uncertainty. Officers with responsibility for disaster planning and management need to be given training and special support in dealing with uncertainty as a central element of social life. At the same time they need to be supported by senior management in making decisions to allocate resources to planning for high consequence, low probability events. Senior managers can give critical support in indicating whether disaster management planning and associated activities such as risk and vulnerability assessment is to be given a priority. Senior officer mandates would resolve a source of doubt and uncertainty for many middle managers.

Workloads, Direction, and Resources. At the same time as providing strategic direction, additional resources, or reduced workloads, are needed if risk and vulnerability are to be properly assessed. Competing demands for resources inadequate to meet all those demands often results in all tasks being completed suboptimally.

Existing Knowledge. Existing knowledge and data sources can be tapped rapidly to provide indicative risk and vulnerability assessments. These sources need to be identified and catalogued as metadata; this would save considerable time and effort in preparing more detailed assessments.

Integrating Expertise. Parallel with using existing knowledge is the benefit from integrating existing expertise, which typically is held in different parts of organisations. Our research indicated that social services, planning, environmental services, engineering and physical infrastructure, and public health services could all contribute to a comprehensive risk and vulnerability assessment of an agencies clients. But this was rarely achieved in practice; at best it occurred as an afterthought. However, all our respondents indicated that there were synergies to this type of interaction as well as better coverage of the risk landscape. This is a planning strategy that is dependent on senior officer mandate.

## **Research project 4: Development of community capacity**

### **Assessment methodology as applying to disaster management capability**

This project is underway at the moment, and we have not reached any definitive conclusions; indeed, no tentative conclusions. Our hypothesis is that community capability building projects that embrace social, health, environmental, economic, and infrastructure issues can contribute to enhanced disaster management capacity. This is presaged in part on the notion intrinsic to capability that it is sustainable, and this concept is now entering the language of disaster management. But we

suspect that particular activities can do more than promote sustainability in so far as they can directly and in specific and discernible ways contribute to particular disaster management skills, knowledge, and resources.

It our supposition also that this increased disaster management capacity will not come in the form of, or be derived from, additional resources. These are not likely to be forthcoming in the short-term except perhaps as targeted, time-limited government subsidies. However, improved knowledge of local skills, shared knowledge, and improved linkages and networks may contribute significantly to local capacity. This capacity may not be improved significantly in the area of operations, which is crucially dependent on physical resources, but may be much strengthened in areas of local contribution to policy advice and development, risk perception and risk analysis, and vulnerability and resilience assessment.

We expect to conclude this project in mid-2003. A further comparative study between Australia, the United Kingdom, and the United States or Canada is then proposed to provide triangulation and the evaluation of our conclusions from societies that share many similarities in their value systems, social organisation and behaviour, and disaster management arrangements.

## Conclusion

Many of the conclusions we drew from our research are already known in the developing world, especially in relation to values, beliefs, and behaviour at local level and how these are relevant to disaster management. In this sense our conclusions simply confirm much other research. It appears to us that disaster management agencies need to address some critical matters if they are to progress with a better understanding of local and community responses to risks and disasters and if they are to improve disaster management effectiveness.

These issues include, but are not confined to:

1. The current demand for local and community engagement in the disaster management process has its basis in civic rights, the duties and responsibilities of citizens, as well as the practical issue that disaster management is only fully effective when the community is an active participant. However, given the responsibilities and commitments of day-to-day life and such competing priorities as managing families and employment, it may well be the case that engagement in disaster management will rarely be given a high priority by local people. They may argue (in our view, with at least partial justification) that it is the role of government to protect its citizens. In any case, local capacity to commit a large amount of time and effort to unlikely events is not high. Governments need to be clear about what they can expect from citizens in dealing with unlikely events that, in competition with day-to-day matters, have a

low priority. This is apart from the argument that the drive to engage the community may be a covert means of shifting responsibility and costs from government onto local people.

2. Incorporating local assessments of risks into the planning process, not only so that local issues can be addressed but also so that a proper priority can be established for the planning and management of events which are traditionally considered to be 'disasters' such as fires and floods.
3. Understanding local values so that sustainable communities can be built that encompass these values in ways, which allow for the realistic management of the spectrum of risks faced by, and perceived to be faced by, local communities.
4. Moving from a response-based approach (which still inclines to a focus on the hazard agent as the object to be controlled) and a command and control model of management to an approach which recognises that managing consequences, and developing response options and mechanisms on the basis of a comprehensive risk assessment, will lead to improvements in the engagement of local people in the management of the risks that they face.

Finally, we would like to acknowledge all those people who worked with us in this research, as collaborators, partners, advisors, and contributors and as interviewees. Often an individual filled many of the roles. We learned early on that people in disaster-affected communities are often inundated with well-intentioned researchers. Well-intentioned they may be, but this does not make the nth or nth + 10 research team any easier to deal with. But all the people we interviewed were gracious and provided us with many new insights.

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### Authors

Philip Buckle  
Disaster Management Centre, Cranfield University  
Shrivenham Campus, Swindon SN6 8LA, UNITED KINGDOM  
P.D.Buckle@rmcs.cranfield.ac.uk

Graham L. Marsh  
School of Social Science and Planning, RMIT University  
GPO Box 2476V, Melbourne, Victoria 3001, AUSTRALIA  
graham.marsh@rmit.edu.au

Sydney Smale  
State Coordinator for Disaster Recovery  
Victorian Council of Churches, Victoria, AUSTRALIA