

Risk and emergency management

Michael Tarrant looks at the challenges of the last 20 years that have contributed to developing current concepts and approaches to the emergency management function

Introduction

The 20th anniversary of *the Australian Journal of Emergency Management* coincides with a significant step in the process of enhancing decision-making and resource allocation in disaster management. A series of very significant disasters in the US and Australia through the 1960s and 70s triggered reflection on the conceptual and organisational underpinning of disaster management. These changes were manifested in Australia by the formation of the Natural Disasters Organisation (NDO now EMA) in 1974 and in the US it was the formation of Federal Emergency Management Agency (FEMA) in 1979. The “all hazards comprehensive emergency management approach” (McEntire 1997) was a major step forward from a civil defence paradigm of response and relief. The new framework, which included concepts such as prevention, mitigation and recovery, generated a need to allocate resources across a range of activities and hazards. This broadened framework required the development of new approaches (at least for disaster management) and the work on hazard analysis was one of the first steps. Hazard analysis involved identifying and assessing the characteristics of hazards, communities and the environment in which they interacted. The context for disaster management over the past 20 years has been a trend of ever increasing scope (see Figure 1). It has taken the sector from a civil defence function to the mainstream in community and organisational functioning. The challenge over the past 20 years has been to develop concepts and approaches to support the shift from the margins to the mainstream, coupled with an ever broadening context.

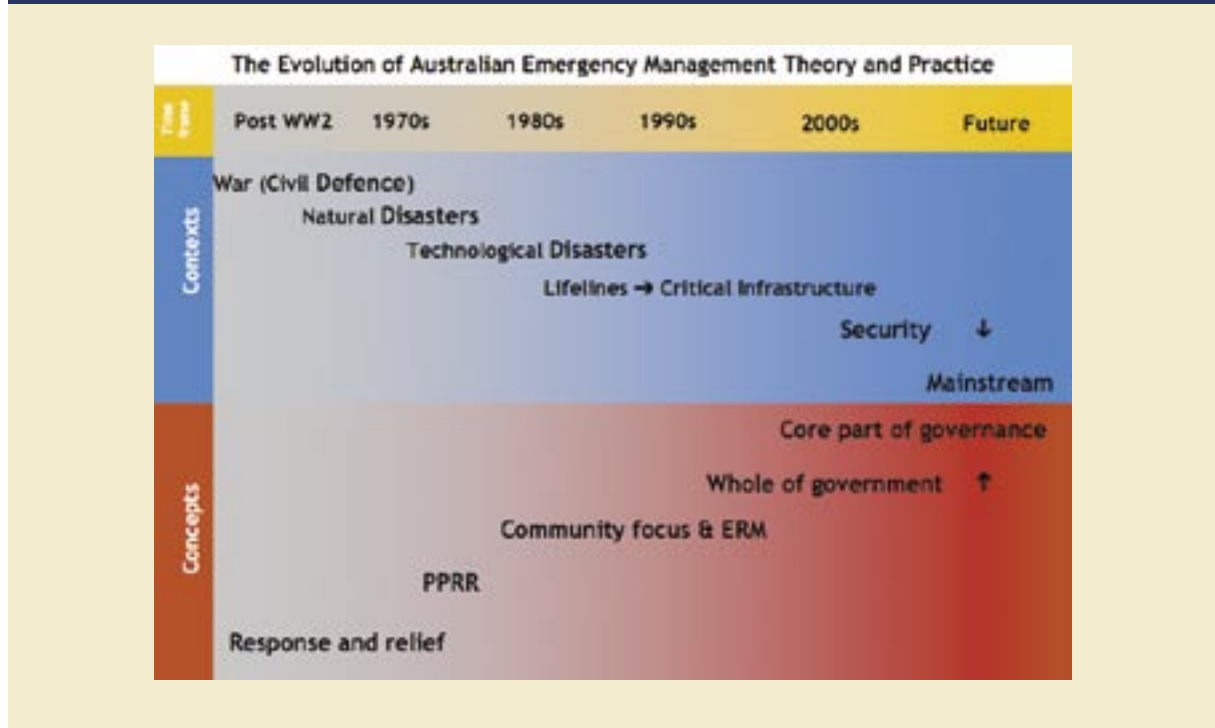
In Australia this activity began with the development of the first hazard analysis courses and support materials in 1986 at Mt Macedon, Victoria. A team, with a core membership of Bevis Dutton, John Handmer, Russell Blong, George Silberbauer, Neil Britton and myself, assembled to develop the concept. It soon became obvious that understanding and mapping hazards was only a starting point and that

the interface with communities and the environment in which that interaction took place was central to disaster management (McEntire 2004). The process of developing this broader understanding led to a series of workshops and activities in the 1980s. These included hazard and community analysis, disaster consequence assessment and economics of disaster. In 1989 the workshop *New Perspectives on Uncertainty and Risk* identified and mapped many of the issues that would challenge progress in disaster management over the next two decades.

The next major stage in the evolution of approaches to emergency management occurred with the publication of the first *Australian Risk Management Standard* in 1995. This provided an holistic framework supporting the continued evolution of disaster management. Comprehensive emergency management enabled thinking about approaches beyond response and relief. The use of risk management was crucial in providing a common conceptual framework and language for the emergency management sector to engage more widely in society. It was also flexible enough to cope with changing contexts. The other important shift was the recognition that a whole-of-government approach was crucial to dealing with complex problems such as disaster management. There was growing acceptance that effective emergency risk management is a core part of good governance.

The most important characteristics of disasters are that they don't happen very often, are large and complex, and require non routine activity from individuals, organisations and communities. This makes them particularly prone to myths and inappropriate assumptions. The research literature on myths goes back to Quarantelli and Dynes in the 1950s. Furedi (2004) and Auf der Heide (2004) are very good recent introductions to disaster myths. Disasters are a very complex policy problem which span all levels and most functional areas of government. This was clearly demonstrated by *Hurricane Katrina* in 2005. The acceptance of the concept that a whole-of-government approach is an acknowledgement that disaster management is a cross cutting problem. Therefore emergency management is a function made up of many players rather than the concept of an emergency manager. The concept of the function transcends organisations and communities in both public and private sectors.

Figure 1. An overview of the evolution of emergency management theory and practice over the past 50 years in Australia



Two of the most important challenges for emergency management in Australia are the fields of risk and public policy. Risk is critical because it underpins how we think about disasters and the public policy frameworks for implementing activities within government. Similar challenges apply to people working in the private sector. Risk has rapidly accelerated as an area of interest over the past ten years across our society. This trend has been mapped in an analysis of mass media reporting (Lupton 1999). Public policy is receiving near universal interest world wide as the public sector tries to cope with a rapidly changing world (Kettl 2003). One of the new themes to emerge in public policy is a focus on community. Community, in all its diverse meanings, has now been included into public policy landscape at all levels of government across Australia. How these two drivers are reconciled in the context of emergency management is going to stimulate significant reflection on development and delivery of services.

Risk

The terms 'risk' and 'risk management' have now become central to the lexicon of just about every field. Works like Beck (1992) have made a case for the centrality of the concept of 'risk' in society. However just about every aspect of the risk concept is contested and the gap between perspectives is not closing. Lupton (1999), Coles et al (2000), and Slovic (1999) provide excellent overviews of how risk is conceptualised and map the divergence in perspectives. Furedi (2004) raises very important questions which are beyond the scope

of this paper but illustrate the breadth of contemporary debates about risk. "In regard to risk, uncertainty and powerlessness are not simply the outcome of an engagement with a specific risk. Such sentiments are systematically transmitted through popular culture" (Furedi 2004:135). The relationship between emotional vulnerability and the wider global threats to human existence is most clearly represented through the concept of being "at risk" (Ibid: 130). This thinking may provide significant insight into how risk might be managed.

A key theme which is often raised is that there should be increased community participation and responsibility in managing risk. If there is an expectation of significant changes in behaviour by individuals then risk assessment and/or risk management will have to move beyond the idea that risk is something that is independent of minds and cultures, waiting to be measured. Unless an approach is developed that moves beyond technical assessments, we are doomed to be met with either apathy or occasional aggression by the public when attempting to engage them in managing risk. The idea that risk can be objectively quantified is often expressed in equations such as risk = consequence x probability. Slovic (1999) makes the point that while danger is real there is no such thing as "real risk" or "objective risk". Technical risk assessments are based on theoretical models, whose structure is subjective and assumption laden. Subjectivity permeates low probability high consequence risk assessments because they rely on judgements at every step of the process.

At the core of this perspective is expected utility theory. It is generally assumed that people will follow the rules if they have sufficient information and time to dwell on the consequences of different paths (Krimsky and Golding 1992). It is essential to have a sound scientific perspective but it is not sufficient. There is a significant body of research that challenges the assumption that people desire the most accurate and precise information possible (Smithson 1989). The 'objectivist' approach to risk is too limited a perspective on which to resolve complex policy problems such as disasters (Beck 1995, Coles et al 2000). If a goal of public policy is active participation by the public in managing risk, then a richer construction of risk is needed.

Over the past 30 years enormous resources have been invested in studying risk in the context of the environment, in particular, hazardous industries. This work shows that the public has a broad concept of risk, qualitative and complex, that incorporates considerations such as uncertainty, dread, catastrophic potential, controllability, equity, risk to future generations and so forth (Solvic 1999). These considerations have to be acknowledged and strategies developed to integrate them into the risk management process. Effective risk communication will be predicated on developing processes that respect these dimensions. The evolution of thinking about risk is demonstrated by Fischhoff (1995) where he outlines the developmental stages in risk communication over the past 30 years. While this has been largely based on issues such as chemical contamination, it does have broad application to emergency management:

- "All we have to do is get the numbers right
- All we have to do is tell them the numbers
- All we have to do is explain what we mean by the numbers
- All we have to do is show them that they've accepted similar risks in the past
- All we have to do is show them that it is a good deal for them
- All we have to do is treat them nice
- All we have to do is make them partners
- All of the above" (Fischhoff 1995).

One of the most helpful definitions of risk comes from the *Australian Standard on Risk Management AS/NZS4360* "The chance of something happening which will have an impact on objectives." Risk is conceptualised as having both positive and negative consequences in the context of objectives. This definition is powerful because it acknowledges peoples' or an organisation's aspirations and values as fundamental in conceptualising risk. To illustrate this point take three different groups; policy makers, the experts/scientists, and laypeople. All have different objectives and contexts which need to be identified and acknowledged in the risk management process (Garvin 2001).

Experts spend much of their time trying to focus on problems and to disaggregate issues particularly if there is a strong technical context. Policy makers and researchers run the risk of getting so deeply entrenched in their intellectual or service delivery silo that they have difficulty in appreciating the way people think and function. This is exacerbated in situations where there are high levels of uncertainty and complexity. One unfortunate outcome of these differences is the labelling and stereotyping of the other groups. Typically:

- scientists are perceived as out of touch and narrowly focused. They are promoting their research agenda and wanting more funds;
- the wider public is perceived as irrational consumers who don't understand the real risk, keep changing their minds and don't change their behaviour, even when clear evidence is presented to them; and
- policy/decision-makers are perceived as politically motivated and base decisions on expediency rather than evidence.

Experts and policy makers are practised at identifying, analysing, evaluating and treating risk appropriate to their context.

The public on the other hand, draw on a much broader range of information and cues to make decisions. Questions such as whose objectives are at risk? Are the costs and benefits equally distributed? Who is making the judgement about the risk? What is going to be done about it? Who is included in the decision making process? Risk treatments and their acceptability are inextricably tied up with judgements about the risk.

Community and public policy

There has been a big swing in Australian public policy to the idea of community over the past ten years.

"In Australia all states and territories have joined the Commonwealth in embracing community as the foundation for policy making and implementation" (Adams and Hess 2001). Community is about groups of people, who create relations based on trust and mutuality, within the idea of shared responsibility for wellbeing. Spatial communities and communities of interest are the main forms of communities (Adams and Hess 2001).

One of the greatest challenges facing government today is how to engage citizens in the decision-making process in ways that suit both citizen and government (Bishop and Davis 2001). Edwards (2000) goes on to develop this point:

"In particular, in circumstances where there is much conflict on an issue and/or many organised stakeholders, and in circumstances where there may be many alternative solutions and/or high uncertainty on outcomes, a participatory framework for policy development would seem essential for policy progress."

A number of drivers have been identified behind the current interest in participatory approaches. They include declining trust in public institutions, and the rise of social movements and public sector change (Bishop and Davis 2001). Like the debates about risk, community involvement in policy development and implementation is a contested issue and is largely a reflection of the values of the participants. "This new interest in participation does not create agreement about the nature of citizen involvement in policy processes" (Bishop and Davis 2001: 2).

If emergency management is to move beyond its traditional forms of service delivery to mitigation and contested fields, such as controlling the use of land, then many of the approaches emergency management has used over the years need to be transformed to the realities of a new policy environment. The way risk is understood by policy makers, experts and the layperson presents major challenges for managing the risks associated with major hazards interacting with communities and what they value. Controlling the use of land is an excellent example.

Uncertainty is a crucial dimension of many extreme risks. It is particularly important in understanding the differences in how risk is understood by experts and the lay public. From the perspective of any one particular householder, the chance of a house being impacted by a major hazard in a given time period is very small. If you take a researcher or policy-maker's perspective then the chance of a major hazard occurring in the area of interest dramatically increases. This gap between actors generates a fundamental mismatch about managing the risk. In dealing with low probability high consequence events, it is frequency of occurrence rather than the effects of exposure that is unclear. The implications of this are pointed out by Solvic (1986) "events that have not been previously experienced tend not to be perceived as worth taking account of." Compared to many health and environmental risks, the uncertainty associated with disasters centres on frequency or return period. "When will a destructive earthquake affect my house?" compared to a health issue "Will barbequed meat give me cancer?" In areas such as health and the environment uncertainty relates to the consequences of a risk rather than its occurrence.

In many cases there is little doubt that an area is potentially exposed to a high intensity bushfire or is located on a flood plain. The question is when will it be impacted? Because any one location may be very rarely affected thus allowing for great variation in the assessment of risk.

Case study: managing bushfire risk

The discussion so far can be illustrated by examining the issues involved in managing bushfire risk. If risk is defined as failure to meet objectives then what are the objectives of residents in high risk areas around the edges of cities in South Eastern Australia? This periurban fringe of small holdings occupies a vast area and has many different environments from heavy forest through to open grasslands. These areas are largely occupied by people who specifically selected that environment; that is they have made a lifestyle choice. They may be motivated to live in these areas by a whole raft of reasons; space, hobby farms, healthy and good environment for families, etc. Their commitment to this choice is demonstrated by having to make significant sacrifices that may include long travel times to work to avail themselves of this lifestyle.

One key characteristic of the people living in this environment compared to many traditional rural communities is that a significant proportion of this population has little experience of bushfire apart from what they see in the media. For the vast majority of people first hand experience of fire is still rare. From a policy and institutional perspective there is a large group of Australians who live in areas exposed to bushfire whose lifestyle is strongly values driven but who have virtually no first hand experience of bushfires.

In Victoria, fires with significant fatalities in the post World War II period have occurred in 1962 (32 dead), 1969 (23 dead), and 1983 (47 dead). Major fires with several fatalities occur about every ten years on average.

So from a policy perspective it is only people who are older than 30 to 40 years of age who have any chance of having clear memory of a severe fire event much less experiencing one. A similar situation exists in South Australia and Tasmania. The Eyre Peninsular fires of 2005 were remarkably like a series of fires in Victoria in the early 1960s. Forty years is a long time to rely on memory and experience. From a risk management perspective we have growing potential and declining experience.

Managing bushfire risk in the urban-rural interface also involves a large number of other policy problems and issues. Some are directly related to bushfire risk and others just add to the complexity of the process. These include pest and weed management, water quality and septic tanks, size of sub divisions and maintaining lifestyle, habitat maintenance, visual amenity, and flood plain management (floodplains can be very attractive places to live). There are significant debates about what constitutes a good environment and these are tied to people's objectives and why they made the

choice to move into that location. The acceptability of risk treatments is also enmeshed in many of these other issues and problems. The broad spectrum of lifestyle choices and values, coupled with people's understanding of risk, makes an extremely complex policy environment.

Any one individual is exposed to an enormous range of messages about risk, be it; health, food, the environment, safety, retirement and education to name a few. They are also exposed to many conflicting and contradictory messages. On one hand people get messages that bushland and trees are attractive and good for the environment. On the other they get messages about the dangers of lots of trees and scrubs around a house, "how could people live in such a dangerous environment?" So an individual thinking about how they are going to allocate their time and resources to manage their risks are faced with an often bewildering barrage of information which is processed and transferred into action around their values and objectives. People are continually bombarded about risk via marketing from retailers, lobby groups or government agencies seeking to alter awareness or behaviour.

Disasters are a social phenomena which span most functional areas of government as well as increasingly involving all levels from Commonwealth to local government. There has been a growing realisation of the challenges that cross cutting issues pose to Australian public policy. The tension between the vertical processes of government represented in the function based departments and the government's horizontal problem is growing (Kettl 2000). Edwards (2002) suggests that there is a growing recognition in Australia and countries such as the UK, Canada and New Zealand, that a problem exists with a silo mentality. This is particularly the case with complex problems such as disasters where the management of the risk spans many functions and levels of government.

How then might decisions in complex fields with high levels of uncertainty be made? What institutions exist in other sectors which may be an appropriate analogue for the uncertainty and complexity of managing bushfire risk? The legal system has used the juries over many years. Here a group of randomly selected individuals are called on to listen and reflect on evidence and make a judgement often under high levels of uncertainty. It is not suggested that juries in the legal sense be used but rather that groups or panels of laypeople may be able to contribute to resolving difficult questions; particularly when it comes to the appropriate use of land. The inappropriate use of land can provide very significant gains to developers, but the potential losses are transferred to future generations. The jury system

is a very old institution which, interestingly, is facing some significant difficulties in dealing with scientific uncertainty and complexity in an adversarial context (Slovic 1999). In the case of managing risk what processes might society or communities use to make decisions about uncertain and complex issues? For example what is an appropriate use of land? What is an appropriate management regime for that land? Given both these questions are highly contested, how then do we, at a body politic level, make decisions about these complex and highly uncertain situations that are robust and sustainable?

Conclusion

If the trend to manage risk through greater participation and the acceptance of individual responsibilities is to be successful, then many gaps in our understanding will have to be addressed. More public education and awareness is of limited value until we have a better appreciation of the way people think about risk and their decision making processes. Program C in the Bushfire CRC is addressing a number of these challenges (see www.bushfirecrc.com).

Researchers and policy makers need to develop institutions and structures for engagement that reflect individual needs and how people make decisions if risk reduction is to be sustainable. This will require the integration of multidisciplinary perspectives across three broad areas to ensure that:

- social, economic and scientific inputs are credible;
- risk management is socially, economically and scientifically robust; and
- procedures, processes and outcomes have wide societal legitimacy.

At present there is a serious imbalance in the allocation of research resources across elements of these areas. One of the challenges will be to develop strategies to fill the gaps. Until we redress that imbalance and bring together these perspectives then we will fall well short of effectively managing major risks in Australia. The past 20 years has seen significant advances in thinking and practice in emergency management. A new generation of senior managers have moved into the field, new frameworks have been established, new stakeholders engaged, and the depth of understanding in the field has increased. The private sector is becoming increasingly engaged in managing non routine risk. However because of the challenges posed by the emergency management field it is important to remember that "good public policy and management is hard work, puzzling, complex and frequently frustrating, fads often become a simpler alternative to this reality" (Adams and Hess 2001).

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