Chapter 11

Learning From Analyses of Policy Frames and Informal Institutions in the Fire Management Sector of Victoria, Australia

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Abstract If public policy sectors dealing with natural hazards are to play their part in climate change adaptation, the sectors must themselves be adaptive in their policies and larger governance contexts. Facilitating adaptive governance requires collaboration among many parties in the complex policy domain of natural hazard planning. To benefit from such collaborative processes as well as inquiries, reviews and experience, public sectors need to adopt a reflexive learning approach. Reflexive learning involves explicit consideration of current and alternate policy frames and informal institutions that structure a sector's governance arrangements, policy options and practices. The case for reflexive learning in enabling an adaptive governance is supported by lessons from a range of literatures. Therefore, this chapter does not discuss lessons from a particular bushfire event. Rather, it argues that for lessons to be learnt from natural hazards and adaptation planning, public policy sectors need a capacity to reflect upon and possibly change the policy frames and informal institutions that structure their current approaches. The chapter will argue this by discussing a study of policy frames and informal institutions of the fire management sector in Victoria, Australia, with a particular focus on the perspectives of middle or 'street level' bureaucrats.

Keywords Reflexive learning · Institutions · Policy frames · Public policy · Fire management

11.1 The Setting

South-eastern Australia has a reputation for being particularly fire-prone. Communities of this geographic region live in landscapes that have complex relationships with fire. Ecosystem health influences human well-being. Circularly, the health and thereby

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vulnerabilities of those systems depends on how we interact with and manage them, including how we interact with fire as both a tool and threat. Ecosystem diversity and vulnerabilities are shaped through suppression, exclusion and use of fire. Different land uses can fragment natural systems and thereby complicate or remove fire regimes from a landscape. The need to restore and 'reconnect' ecosystems also has implications for bushfire risk. Yet while fire plays a key role in the function of many Australian ecosystems, bushfires can present a real and grave threat to both social and ecological communities.

Even without climate change, fire management¹ is already a multi-stakeholder, multi-variable, multi-scale policy problem that has multiple partial 'solutions' and inevitable residual risk (Gill 2005). It is a complex policy problem not only because fire is a complex biophysical phenomenon (Cary et al. 2003), but because it is also a complex *social* phenomenon (Bradstock and Gill 2001; Gillen 2005). A holistic view of the governance of fire management reveals a diverse array of interacting policy issues that influence social and ecological vulnerabilities to bushfire. Those issues include: emergency management; public land and alpine management; water management; biodiversity conservation; forestry; tourism; health; education; community safety, engagement and development; fire suppression and prevention planning; land use planning; building standards; agriculture; and major infrastructure management including electricity, water, roads and rail. As a necessary consequence of the extent of skills and knowledge required in managing these issues, there is an array of organisations and agencies beyond fire management agencies involved in the fire management policy sector. Considering the potential implications of climate change for each of these issues, it becomes readily apparent that social-ecological vulnerabilities to bushfire are likely to change. This has potential to increase the complexity of fire management and drive an imperative for an adaptive approach to its governance.

11.2 Climate Change and Fire Management

A burgeoning body of research repeatedly highlights that climate change will affect fire weather. Increases in fire danger imply potentially higher fire intensities, longer fire seasons and more 'total fire ban' days (Hennessy et al. 2006; Lucas et al. 2007). Fire suppression effectiveness is limited to fires below about 3,500 kW/m intensity, which compares unfavourably with wildfire intensities that exceed 100,000 kW/m on 'blow up' days such as Ash Wednesday 1983 (Incoll 1994) and likely February 7th 2009. If we are to see more 'campaign²' fires such as those experienced in Victoria's Alpine regions in 2006/2007, personal and employer costs associated with volunteers including reliance or pressure on the good will of volunteers and their employers will increase (Hennessy et al. 2006). More very high and extreme

¹ Fire management refers to landscape or vegetation-based fires (i.e., not building fires).

² Campaign is defined here as a fire that remains burning for days or weeks.

fire danger days might also raise the chance of house loss. Analysis has shown that the majority of house loss in Australia's bushfires has occurred on days where the Forest Fire Danger Index (FFDI) exceeded 100 (Blanchi et al. 2004) and little house loss has occurred on days where the FFDI did not exceed 50 (Blanchi et al. 2010). While other important factors contribute to the degree of house loss, such as preparedness and actions on the day, any increases in fire weather conditions that mimic those seen in Victoria in February 2009 and Canberra in 2003 may well magnify the probability of house loss.

Looking beyond these biophysical projections, climate change also has the potential to alter underlying drivers of vulnerabilities to bushfire and fire regimes. Bosomworth and Handmer (2008) proposed several issues that may contribute to increased social-ecological vulnerability to a changing bushfire threat. These issues include implications for incomes from rural industries, water quality and availability, and their combination. For instance, there may be a negative impact on rural incomes, if climates in areas vulnerable to climate extremes become more hostile to farming (Lynn 2003; Mendelsohn et al. 2007). It is not clear that this will happen in Australia, but it is clear that climate change will likely have its most dramatic impacts on regions already stressed by high temperatures and low precipitation (Bosomworth and Handmer 2008). In south-east Australia, water availability may be reduced (Jones and Durack 2005) and may force consideration of alternate sources for suppression by agencies and householders. Water quality and yield may be affected if the 'protective' forests of our catchments burn and then suffer post-fire floods (Tryhorn et al. 2008). Post-fire floods, such as those seen in Gippsland in Victoria in 2006, may diminish recovery capacity of communities. An Insurance Australia Group paper (Coleman Undated) argues that there is potential for market erosion of insurance driven by the combined effect of increasingly severe climatic events and underlying socio-economic trends that can diminish investment viability and stress insurers, reinsurers, and banks to the point of impaired profitability and even insolvency. They suggest that communities will then have to deal with rising or unavailable premiums and the hardships of the events. When such issues combine to create 'double exposures' (O'Brien and Leichenko 2000), there may be an exodus from parts of rural Australia with implications for local economies through reduced demand for goods and services and an already decreasing volunteer base from an even further reduced population.

Bosomworth and Handmer (2008) also suggested that climate change has the potential to alter realistic expectations surrounding bushfire impacts, preparedness and suppression capabilities, and this has implications for communications and dialogue surrounding fire management. If the frequency of extreme fire danger increases, then translation of seemingly simple but highly sophisticated concepts that underpin programs such as 'stay or go' may become more difficult if not impractical, with no diminution of 'the tension between the ideology and practical need of asking those at risk to take more responsibility for managing their own risks' (Handmer and Tibbits 2005). Such challenges are only exacerbated in the context of tourism.

Explication and discussions of fire management complexities, in particular the limits of risk reduction (not elimination), have the potential to become increasingly

demanding. When bushfires occur, 'blame' often gets placed on the hazard or the emergency managers rather than on the conditions of vulnerability that have resulted from a range of issues. These include lack of appropriate funding and resources for land management and community engagement, certain economic policies, poor private land management and inappropriate land use planning (Schipper and Pelling 2006; Handmer and Dovers 2008; Pelling and Dill 2009). Without open, explicit discussion of these issues, such 'blame games' will only escalate with a rise in major bushfires.

Finally, if a changing climate increases fire frequency ecosystem dynamics are likely to be altered, changing vegetation types, fuel loads and fuel types (Cary 2002; Mouillot et al. 2002). Precisely how this may manifest however, is not clear (Goldammer and Price 1998; Dyer et al. 2002; Sardans and Penuelas 2007). Concurrently, stressed human populations may place further burdens on ecosystem services through strategies to mitigate and adapt to climate change, including responses to an increasing fire threat. Actions to adapt to and mitigate the impacts of climate change will have other implications for fire management. The expanding markets in commercial forestry or native vegetation 'protection' for carbon sequestration will bring a concomitant need for protection from destructive fires, as well as consideration of how they may affect fire risk and regimes. Creation of habitat corridors to facilitate the adaptive capacity of ecosystems for example, raises similar challenges. These land use changes will produce valuable and additional assets in the landscape and likely pressures for protection of these, as well as existing assets.

Of greatest concern however, is that many of the most severe impacts won't stem from the influence of climate change on fire weather per se, but rather from synergistic interactions between climate change and existing pressures and trends that affect social-ecological vulnerabilities to fire (Thiele 2000; Thomas et al. 2004). For most public sectors, such a picture complicates assessment of impacts and development of policies to manage those impacts (UNFCCC 2004). Adapting to climate change requires a more sophisticated understanding of the underlying drivers of vulnerabilities and an adaptive approach to governance and policies. Without an adaptive approach to governance and policy, climate change will only serve to exacerbate the challenges of managing the complex social-ecological issues involved in fire management, and limit our capacity to adapt to climate change.

In the spirit of this argument, the remainder of this chapter will not discuss lessons from a particular bushfire event. Rather it will argue, through examples, that for sectors like fire management to learn lessons from planning, experience, inquiries and reviews (i.e., to be adaptive), they need a capacity to reflect upon and possibly change the policy frames and informal institutions that structure their current approaches to governance and policies. Moreover, consideration needs to be given to a range of alternate frames and ways of addressing, changing or working with a sector's informal institutions. Without such reflection, the disaster risk reduction (DRR) field may become better at things that maintain barriers to improved DRR and reduce our adaptive capacity. To explain this argument, the next section defines frames and institutions, and discusses their influence on the potential for learning and adaptation—drawing on lessons from a range of literatures.

11.3 Learning Lessons for Adaptation

This study drew on lessons from literatures surrounding public policy and administration, and organisational learning, as well as DRR and climate change adaptation (CCA). A central lesson from across those literatures is that for policy sectors to learn and adapt, there is a need for reflection upon the frames and institutions that structure a sectors' governance, policies and practices. In taking lessons from a broad range of literatures, this section will explain the concepts of policy frames and informal institutions as key influences on the ability for public sectors to learn from experience and to consider perspectives and impacts not yet experienced.

Underlying frames or ideas guide definition/s of a policy sector's fundamental goal, the 'problem' it is seeking to 'solve'. Policy frames are ideas structured around what is causing the problem or preventing attainment of a sector's fundamental goal, and thereby, what particular solutions or policy choices are appropriate. The notion of frames is often attributed to Goffman (1974) who denoted them as schemata of interpretation that enable people to locate, perceive, identify and label occurrences within their life space and the world at large (p21). Rein and Schön (1991, p. 263) define a frame as a perspective from which an amorphous, ill-defined problematic situation can be made sense of and acted upon. It is more a way of thinking about a problem or subject than it is an assemblage of facts (Fischer 2003, p. 103). "Like a window, we see the world through frames that determine our perspective while limiting our view to only a part of a complex world around us" (Creed et al. 2002, p. 36).

Consequently, different frames direct attention to different aspects of a situation, telling different stories about what is going on, and how the situation should be managed (Fischer 2003; Dewulf et al. 2004; de Boer et al. 2010, p. 464). For example, the framing of drivers of vulnerability influence the nature of policies and planning aimed at addressing vulnerability to various hazards (Blaikie et al. 1994; Turner et al. 2003; Birkmann et al. 2009; Handmer and Dovers 2008). This is most readily apparent in approaches that seek to manage the hazard alone, without consideration of underlying and complex drivers of vulnerabilities. One of the readily cited examples is the construction of floodwalls for flood management (Handmer and Dovers 2008). Others may frame vulnerability as an issue of exposure to the hazard. This framing typically underpins land use planning controls such as those that seek to prohibit development or at least, define development types within areas classified as bushfire prone. Yet others may turn to Blaikie et al.'s (1994) framing of vulnerability as being driven by various combinations of factors in our social, political and economic environments (as distinct from the natural environment alone), because these factors also structure our lives. While research regarding frames and framing is found throughout the social sciences (Druckman 2001, p. 226) and is currently finding increasing attention in the CCA field, in the natural hazards field there are very few authors who have directly considered the implications and influences of framing for hazards planning, policies and governance.

Policy frames have their greatest impact on public sector policies and governance when they are institutionalised—becoming part of the cultural-cognitive

environment of a sector. Institutions include both formal and informal 'rules'³. They are different than frames because there is a collective or cultural sense of obligation to follow 'the rules', whether explicit, implicit or even unconscious. Because informal institutions have an obligatory dimension (Scharpf 2000; Helmke and Levitsky 2003), they can be every bit as important in shaping actors' behaviour as formally agreed procedures (High et al. 2005; Lowndes 2010, p. 68). They are often based in assumed ideas of appropriate behaviour rather than calculated returns expected from alternative options (March and Olsen 1989, p. 22). As norms and routines that guide social behaviour (Scott 2001; Ostrom 2005), informal institutions give rise to stable, recurring patterns of behaviour and thus structure collective actions (Balzer in Lauth 2000, p. 23; Lowndes 2010, p. 61). They are a form of systemic memory without which every issue, whether threat or opportunity, would have to be considered afresh and no action contemplated until basic decisions about proceeding were resolved (Considine 2005, p. 87). There is much discussion in the literature as to whether actors actively maintain institutions because of their material interests, or out of habit. Actors might also (unconsciously) follow an institution because they conceive no alternative, or they regard the alternatives they can imagine as unrealistic (Powell and DiMaggio 1991, p. 11) because they perceive those alternatives to be socially or culturally unacceptable. In public administration, institutions and their institutionalised frames are rarely (explicitly) explored because they are so embedded in the inherited assumptions of the public sector (Adams 2004, p. 32). Appreciating a sector's informal institutions provides further insight into processes of public administration and its adaptive capacity.

Frames and institutions are subtly different but closely interrelated concepts. Just as Blyth (2008) posits that ideas are the blueprints behind institutions, Scott (2001) describes frames as the *cultural-cognitive pillars* of institutions. What people think about the consequences of policies derives from their vision of a good society (Kahan and Braman 2006, p. 148). Epstein (2006) argues that a state observes collective norms or institutions because they are part of how it sees itself contributing to 'good government'. Similarly for a policy sector, its actors—bureaucrats, researchers, politicians, communities—may collectively observe its informal institutions because they are part of how the sector 'frames itself' as contributing to good government or the public good. Consequently, the impact of policy frames depends on the degree or 'thickness' of their institutionalisation (Riker 1980 in Lenschow and Zito 1998, p. 420)—to what degree a frame or frames is enacted through a sector's 'rules in use'.

Together, policy frames and informal institutions represent very strong influences upon the potential for public sectors to realise the depth of any lessons that may be learnt in both DRR and CCA planning. Institutions and institutionalised frames, create expectations of conformity and restrict the attention span of actors (governments, bureaucracies, businesses and communities) to approaches previously found to be appropriate (Koch and Hauknes 2005, p. 34). In doing so, institutions can

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³ Here institutions are defined as the formal and informal 'rules in use'. It does not refer to organisations.

create path-dependent actions and decisions, and resist new ideas because practices and structures are taken for granted, not questioned or not compared against alternatives (Powell and DiMaggio 1991, p. 192; Considine 2005, p. 105). However, learning and adaptation require a capacity for departing from the path-deterministic potential of institutions and institutionalised frames. Ignoring the structuring influences of frames and informal institutions ignores the administrative, cultural and often political realities that new ideas or approaches (such as adaptation) will necessarily have to interact and potentially challenge. As Macgregor (2006) argues:

Without consideration of how the focus of a policy sector is (and can be) framed, 'symptoms' are more likely to be addressed rather than causes, and worse, actions may be misdirected because of a poor understanding of root causes.

11.3.1 Purposive Reflection to Learn Lessons From Natural Hazards Planning

Without purposive reflection on frames and institutions, the success of mainstreaming any new concept or idea will be greatly dependent upon resonance of that idea with a sector's dominant or institutionalised frames. Past policies and frameworks have an important role in not only defining and problematising current issues (Parsons 1995, p. 230), but in providing channels through which current political process must flow (Fenna 2004, p. 136). Consequently, even analyses, inquiries and other lessons will occur within the dominant frame rather than through a multitude of frames that could provide a broader, more adaptive range of policy and practice.

Post-disaster inquiries, reviews and studies are often portrayed as 'windows of opportunity' for learning. Schmidt (2008, p. 307) argues that the ideas that underpin a public sector or policy generally sit in the background as assumptions or ideas that are rarely contested, *except* in times of crises. In natural hazards planning, such 'crises' are very often associated with a major hazard event. Allison and Halperin (1972) and more recently, Boin and t Hart (2003) and Boin et al. (2009), argue that crises generate framing contests to interpret events, causes, responsibilities and lessons in ways that suit the political purposes and visions of future policy directions of government actors and their critics. Explicit questioning of the fundamentals of a public sector is difficult in crises (and post-event responses to them), because managers under intense public scrutiny—as managers dealing with the impacts of natural hazards often are—may be inclined to adopt a 'fortress' mentality to shut out criticism (Weber and Khademan 2008, p. 342) or simply to cope with the stress. Similarly to fundamentally questioning a sector's *raison d'être*, adaptive approaches to policy and administration may be viewed as a threat to existing programs and management (to the dominant frame), rather than as an opportunity for improvement (Folke et al. 2005). This may be particularly so where key actors have hard-won, long-term investments (financial, temporal and reputational) in current problem frames (Connor and Dovers 2004). Consider for example, the reputational and financial investment in long-lived infrastructure such as levees or aerial fire-fighting equipment. However, adaptation demands purposive reflection on a sector's

frames and institutions not just in times of crises, but in the course of improving its efforts, let alone in proactively adapting to climatic changes and taking advantage of the proverbial 'window of opportunity'.

From a reflexive learning perspective, a diversity of views are a strength where different conceptions of issues give rise to contention and debate that ideally would enrich our understanding of policy issues and options. In adapting to climate change, consideration of a multitude of options would provide the public sector with robust⁴ and adaptive policy suites and governance⁵. For this kind of reflexive learning, sector's need to move beyond 'groupthink', they *need* heterogeneity more than uniformity, disagreement more than consensus, creativity more than predictability and frankness more than conformity (t Hart and Kroon 1997, p. 103). Analyses of policy frames and informal institutions can not only aid reflection upon how the sector's policies may be constrained (or not) but can also support consideration of how to approach adoption of new ideas and approaches. A reflexive learning approach could generate different visions about central issues (Blyth 1997, p. 246; de Boer et al. 2010, p. 1), identify options towards addressing a sector's underlying assumptions, and identify different governance, policy and practice options. The following section will discuss results from research that examined policy frames and informal institutions in the fire management sector of Victoria, Australia. Also discussed are the implications for the sector's reflexive learning capacity.

11.4 Barriers and Opportunities

This section attempts to make the preceding theoretical argument practical by discussing some of the policy frames and informal institutions identified in a study of the fire management sector of Victoria, Australia. The research findings drew from the sector's policy practitioners and bureaucrats. As some of the policy experts within political systems, bureaucrats play particular roles in the development and shaping of understandings of policy issues and alternatives (March and Olsen 1989, p. 18)—of how the sector's issues are framed. Middle and street-level bureaucrats work at intersections between strategic and on-ground actions. They have key roles in co-ordinating a diversity of stakeholder inputs, facilitating negotiation between different values, objectives and demands and they make (or at least support) policy development and implementation choices. They have substantial discretion, can control resources, exercise power and are active participants in the preparation, formulation, implementation and enforcement of public policy (Olsen 2008, p. 26).

⁴ A robust policy strategy is one that performs well when compared with the alternatives across a wide range of plausible futures, a strategy that need not be the optimal one in any future; but will, however, yield satisfactory outcomes in both easy-to-envision futures and hard-to-anticipate contingencies (Popper et al. 2005).

⁵ Some authors, such as Rosenthal (1991) and Ostrom (2008), have argued for 'polycentric' approaches that appear to have reflexive, problem-solving potentialities because they can include multi-agency and departmental checks and balances, and informed and interested citizens and public officials.

Through their work practices, bureaucrats or policy practitioners reinforce the policy frames and institutions that structure a sector's governance approach and policy options. Yet outside of the policy analysis and public administration fields, the role of bureaucrats in developing policies and programs tends to escape analysis (Hajer and Wagenaar 2003, p. 88; Miller 2004; Schmidt 2008). Taking the perspective of a sector's bureaucrats provides greater insight into the often contested and always negotiated nature of policy processes, rather than an examination of policy documents alone. Consequently, the analysis presented here centres on the way in which bureaucrats in Victoria's fire management sector frame the fundamental goal of fire management, and on informal institutions that seemingly influence the options these people felt they had in enacting or realising their framing.

Two themes were common among the ways these bureaucrats framed fire management. The first was the idea of fire as a natural and inevitable landscape phenomenon. Equally ubiquitous was the image of 'good fire' (referring to ecological or fuel reducing, and usually deliberately lit) and 'bad fire' (a bushfire that threatens people and assets). However, two distinct 'master-frames' were identified. A master-frame is a metanarrative (McAdam 1994 in Koenig 2005) or a more enduring cultural theme (Gamson 1988 in *ibid*). In this study, the overwhelming majority of policy practitioners framed the fundamental goal of fire management using a sustainability master-frame⁶. A handful of participants⁷ used an emergency or risk management master-frame. Characterisations of governance and policy purpose and options differentiated these two master-frames. Both sustainability and emergency management are globally popular storylines or cultural themes. Typical of policy frames, they each direct attention to different aspects of the situation and tell a different story about what is going on and what should be done (Dewulf et al. 2007, p. 53; Fletcher 2009; Isendahl et al. 2009; Spence and Pidgeon 2010).

11.4.1 A Sustainability Frame (Humans as Part of Nature)

The majority of research participants framed fire management as an ongoing need to balance social and ecological objectives in order to achieve sustainability. It conceived humans as a part of nature, rather than nature as something from which to protect humans. Threaded throughout the storyline of this frame was the idea that because humans are a part of nature, how we choose to live with or against it influences not only our vulnerability to fire but our overall well-being. The language of this frame was accommodating in its rhetoric, with the repeated idea of finding an idealised balance. Biodiversity and natural resource management goals were viewed as legitimate as managing the very real threat that bushfires can pose to life

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⁶ It is necessary to stress that presentation of two master-frames should not be taken to suggest absolute delineation between the conceptions. Some of the arguments underpinning the master-frames drew upon similar normative orientations. Nonetheless, distinctions between the underlying sub-frames were enough to impose an analytically useful, yet artificial, structure.

⁷ It is necessary to qualify that the authors can only talk about those who participated in the interviews or survey.

and assets, and that these two central drivers of fire management policy required negotiation, debate and 'balance'. However, those employing a sustainability framing expressed little certitude that the 'balance' was attainable. In this master-frame, one of the major barriers to achieving a sustainable way of living with fire was that many of the drivers underlying the sector's policy context are not readily identifiable, that many are unknown. Therefore, there are no sole, simple or permanent 'solutions' to achieving a sustainable balance.

Achieving a balance between fire-safe and resilient human communities and sustainable and resilient ecosystems...between short-term and long-term objectives...a bit like the Holy Grail...I don't know how we'd do it, I really don't, but I think that's actually what management is about.

Through a sustainability frame, the choice of 'solution' (policy option) is a value judgement and a question of trade-offs, and the inherently political nature of such trade-offs contributes to the sector's complexity. Several respondents also suggested that the sector's complexities are exacerbated *because* people want a simple solution.

The struggle in all of this—it isn't a scientific question. It's a how much do we value this part over this part over this part. Where do we juggle, how do we make the decisions that juggle at different points on the landscape?

A lot of the issues and dilemmas that we're going to be facing in the future are going to be about what we value, not what we know.

The moral claims of this frame surrounded both social and ecological justice. Social justice included human security conceived as an ability to live safely with fire through vulnerability reduction, supported by an understanding of fire's role in ecosystem dynamics and an overall improved appreciation for 'the environment'. Ecological justice related both to fire's role in many ecosystems but also to broader objectives of land and native vegetation conservation. This frame's storyline was predicated on assumptions of diversity of views, values and knowledge within communities, and of complexities inherent in working with this diversity. For several participants, the inherent struggle within the sector is a broader reflection of our struggle to understand and live with our environment and landscapes, including how we have changed them.

We are not living in a landscape the same as when Europeans turned up. The bush is no longer 'natural' because we have to put out lightning strikes to protect life and property. The presence of 'man' has affected the type of landscape we live in forever and we have to understand that better.

The narrative of the sustainability framing was one of living with an environment in which fire is one of a number of natural, albeit potentially life threatening, facets. Within the sustainability frame, the knowledge needed to achieve that goal is considered limited and the goal is perhaps unattainable. Parallels between the underlying rhetoric of much of this frame and the well-known 'harmony with nature' theme (Jenkins-Smith and Sabatier 1993; Koenig 2006) were obvious. Mirroring that globally popular storyline, the sustainability frame arguably reflects broader

societal shifts towards sustainability or 'ecological modernisation' (Dovers and Handmer 1993, p. 205; Eder 1996; Dovers 2004).

11.4.2 An Emergency/Risk Management Frame (Defending Ourselves From Nature)

The second but less espoused master-frame was of fire management as an emergency or risk management challenge. The basic operating assumption of this frame was that human safety is paramount to all else, and that because fire can threaten that safety, any actions to defend humans from that threat are morally superior to any other issue⁸. Fire was described as something to be battled, prevented, suppressed or controlled, automatically portraying fire as a negative force; as an enemy to be subdued (Wuerthner 2006, p. 60). A language of risk management permeated this framing, focussing attention on the risk of human safety being impacted by fire. In this frame, 'the causes' of bushfire risk were conceived as identifiable and quantifiable—mostly based on a physical location in the landscape. Therefore management of bushfire risk was depicted as equally identifiable and a matter of rational choice.

This emergency management master-frame seemed based on narrower ideas of disaster management than those expressed in many key DRR documents, such as the Hyogo Framework. Although there were expressions surrounding collective or community-based approaches to managing bushfire risk, those employing an emergency management frame used a defensive language that was most concerned with hazard management essentially through fuel reduction or suppression activities. These participants argued that with more funding and resources agencies could ensure 'the community' is aware of bushfire risk (and accepts some responsibility for dealing with that risk) and 'assets' could be protected through suppression and fuel management. Agencies were consistently portrayed as being readily able to define risk—based on exposure to hazard—because of their knowledge and understanding of fire behaviour, fire suppression and fuel management. It was because of this supposed central knowledge that the agencies—the authorities—were also framed as being 'in control' in the face of the threat of fire.

It's an anathema to our thinking in this organisation that anybody could die or we could lose anything.

In the good old days we were the shining yellow knights on the big red charger and "don't worry your pretty little head, we'll look after you".

Yet within this frame, there was an argument that people cannot expect to be defended by the 'authorities'; that communities must take responsibility for defending themselves. While perhaps a reflection of the reality of limited resources, this argument continued the theme that if communities simply understood the 'logical knowledge' that the agencies have, they would gain an understanding of how to defend themselves from a bushfire and prepare 'appropriately' by managing fuel.

⁸ In Maslow's hierarchy of human needs, safety is a fundamental requirement (Aucoin 2006, p. 72).

In this frame, complexity was engendered by the number of organisations and thereby issues that require consideration, which removed the focus from the safety objective. Consequently, while arguing for integrated approaches, the purpose of collective approaches was generally about achieving effective suppression, fuel management and community engagement to encourage and accept fuel reduction activities⁹. Assumptions and predispositions toward this rationale were evident in technocratic interpretations of risk management that peppered many of the interviews and surveys.

It is not rocket science to understand that our fire management planning needs to be risk based; we need to plan collectively to manage and to develop treatment options to treat a risk, and it needs to be tenure blind ('It' being fuel).

The concept of emergency or risk management seemed to serve as discursive glue that many of these bureaucrats rallied around, even if when pressed it turns out they have different understandings of the terms (Lees 2004, p. 102). While an emergency management master-frame may reflect a particular bureaucratic rationality that tends toward order and process, it may also reflect broader societal notions (and thereby demands of government) that with enough of 'the right' information, the 'problem' can be solved¹⁰.

11.4.3 Informal Institutions and Their Influence on the Sector's Capacity for Reflexive Learning

Reflexive learning requires that governance and policy processes use multiple frames or perspectives. Part of this research sought to identify the degree to which this may be occurring in the fire management sector of Victoria. An institutional analysis suggested that while most participants framed fire management in sustainability terms, the sector's informal institutions corral options into the emergency management frame. In other words, the emergency management frame is highly institutionalised and the idea or frame of sustainability has only a slight bearing on current policy options. A key indication was that while most bureaucrats framed the sector in terms of sustainability, when asked about dealing with the implications of climate change for the sector, the majority utilised risk management language. This is perhaps unsurprising as risk management is already a strong discourse within the DRR arena, and is increasingly adopted in the adaptation field. Risk management provides a very powerful discourse for policy practitioners and researchers in conceptualising a structured and clear management approach to the complex challenges of DRR and CCA. The notion of managing the risk of 'extreme events' is increasingly advocated in both arenas.

An institutional analysis provided the second indication that the emergency management frame is highly institutionalised within this fire management sector. First-

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⁹ The language of disaster risk reduction was not expressed throughout any of this data.

¹⁰ Fire management is not alone in this belief. Much of the climate change literature argues for production of 'better' science driven by the idea that this information would encourage action.

ly, the analysis suggested that participating bureaucrats share a sense of obligation to be seen to responding or acting and that those actions must be infallible.

The job that's been done in the last 15 years or so isn't perfect by a long way, but it's getting tougher. The political lack of forgiveness, I mean they're meant to get it perfect or else, so we tend not to take the calculated risks that are inherent in properly managing fire regimes, because of fear of legal sanction.

Perceived as constraints on the policy options available to the sector, these 'rules' were often attributed to a broader societal expectation that agencies can control all bushfires and the ideal of evidenced-based policy that is clearly part of the rational model of public administration. The presence of these overarching institutions provided insights into the presence of several other informal institutions.

One of the strongest institutions was that of scientism (Dupre 2001): the idea that science is the ultimate, neutral arbiter, because it can provide 'the solution'. Irrespective of the master-frame employed, most participants argued that science would support their position. The implication of this institution or 'rule' for the sector's adaptive capacity is twofold. First, it raises the question of which (and whose) science is used to inform policy options, such as whether options are limited to those with a technical or engineered basis. Without reflection, the scientific discipline used to inform fire management's policy options may be quite narrow in scope. This is not to discount the essential role the sciences play in DRR, fire management and CCA, but rather to highlight the second implication. The second implication is that science in general can inform our choices—indicating the implications of various courses of action—but it cannot make those choices because many responses to public policy issues are about value judgements.

The institutional analysis also suggested that within this sector, knowledge of fire fighting and fuel management is bestowed greater legitimacy than other bodies of knowledge.

They are 'old' fire management. Policy people, community engagement, business improvement didn't exist 20 years ago. So "they're fire management and they know how to put fires out", so they're the only ones who know anything. I know that's a bit harsh, but that's a perception that we get.

Fire related views are accepted and pushed by people who have a particular perception and often don't come from a fire background. They don't understand the fire business from a suppression nor prevention perspective they are more involved in policy and budget related tasks and just follow policy when it comes to the nitty gritty....

I was there for 11 years—they still had difficulty in accepting my expertise because of my background. I wasn't a forester.

The institution or 'rule' implied that knowledge that may challenge this 'conventional wisdom' is either illegitimate or even 'taboo'.

It seems like it's a parallel with not being able to stand up and say there are physical limits to suppression. To be able to say basically that fuel reduction burning is hard for all these reasons...Because there is no right answer. It is based on a number of different people's objectives and quite different values...There's no permission to have that conversation.

The parallels with the emergency management frame are obvious—fire-fighting and hazard reduction are central to managing bushfire emergencies—and indicated

again an institutionalisation of that frame. Each of these institutions contains an assumption that factors contributing to the sector's challenges and decision options are readily calculable. This parallels the implicit depiction within many risk management approaches of hazards as amenable to conventional procedures of calculation, management and control within the capacities of established institutions (Pidgeon and Butler 2009, p. 679). Such institutions often exclude many social, ecological and political considerations because these types of underlying factors or consequences are conceived to be indescribable, unamenable to use of probability calculations or cost-benefit analyses, and lie outside prevailing scientific risk-knowledge (Jasanoff 1993; Wynne 2002, p. 469). This is anathema to the concept of reflexive learning, to seeking out a multitude of frames.

11.4.4 Barriers to Learning

While language such as threat, hazard and danger validly leads to prioritisation of strategies focussed on risk and harm minimisation, a singular focus on threat preparation and emergency response tends to exclude consideration of other values, choices and struggles inherent to both fire management and adaptation separately, let alone in combination. These value choices and struggles include how, why and where we live in landscapes, as well as to which risks we give attention and with what (and whose) approaches. Under the dominance of a hazard management rubric, policies and practice are more likely to be instrumentalist in nature, ignoring underlying drivers of vulnerability and resilience in social-ecological systems and limiting options to physical, technical or engineered approaches. This has direct implications for community-resilience, as well as adaptive capacity. On one hand, there is an argument that if communities only understood the requisite, supposedly obvious and rational knowledge that the authorities have, then they would take actions to protect themselves from a bushfire hazard. On the other hand, the institutionalised notions of credible knowledge and skills, reinforces notions of expertise, which may actually be disempowering for community members. Consider the conceptual differences between needing specialist fire trucks and aerial equipment to suppress a bushfire and preparing to defend ones home from the same bushfire with mops and buckets.

In the context of adaptation, an emergency management frame likely limits the perceptual scope of policy and management options to paradigms that imply the calculability of risk to exclusion of other potentially incalculable, complex factors. It also tends toward an implied 'singular' solution—fuel management, community education, more fire suppression equipment. Yet singular solutions by definition, distinguish definitive positions around which stakeholders immediately gravitate, often precluding collaboration, innovation and creativity (Coffman and Umemoto 2010, p. 599). Furthermore, such panaceas are fallacies in complex, dynamic social-ecological systems (Meinzen-Dick 2007; Ostrom et al. 2007). A difficulty of bounding 'legitimate' knowledge to that which is quantifiable not only creates perceptual tensions between agencies and communities, and between policy areas, but traction for adopting adaptive approaches to governance and policy may be especially

difficult. This is particularly so where the knowledge required is *not* quantifiable, immediately demonstrable nor even perhaps known. Climate change associated uncertainties are unlikely to be assuaged by a 'requisite' knowledge that is solely drawn from readily quantifiable data. Climate change will undoubtedly increase the need for us to make value judgments. As stated earlier, science can help inform such judgements, but it cannot make choices for us.

Recourse to rationalist, technocratic approaches is salutary for efforts aimed at evolving the concept of vulnerability reduction in the fire management sector, let alone in CCA. It is even more salutary for any effort to move the sector from an approach that implies a mythical panacea, toward one of reflexive learning (in this, fire management is most certainly not alone). This is not to discount the imperative of emergency management. Rather, this study's results suggest that despite use of the phrase 'adaptive management' in several policy documents, Victoria's fire management sector may not yet have shifted *culturally* to embrace the concept of adaptive management—a concept focused on reducing underlying drivers of vulnerabilities to natural hazards.

11.4.5 Opportunities for Learning

The presence of at least two master-frames, each with their own logics and foci, suggests that this sector has at least two perspectives from which to explore a broader range of options for policy and practice in confronting a changing climate. From a reflexive learning perspective, differences between these master-frames can be viewed as strengths rather than conflicts. Overlaps between the frames can serve as a basis for discussion aimed at transforming circular debates between the various perspectives into an expanded and therefore, potentially more adaptive suite of policies and practice. For example, in the face of the complexities and uncertainties of climate change, an overlap in framing of land use planning as a major driver of risk presents itself as an obvious focal point for the sort of discussion that could actively make explicit the underlying policy frames.

11.5 Future Action

If sectors are to be adaptive in their policies *and* governance, they must give attention to facets beyond formal governance and institutional arrangements. The research presented here indicates at least two steps a public sector might take to building its own adaptive capacity in order to support the adaptive capacities and sustainability of our communities: deliberate reflection on underpinning policy frames and informal institutions, and addressing (or beginning to discuss) them in terms of adaptation.

Sectors could undertake a kind of deliberative reflexive practice to identify additional frames and encourage an expansion of the frames within their purview. For example, Victoria's fire management sector could build upon some initial work with

ideas of cultural burning and learning from indigenous knowledge and relationship with fire. It could also build upon some of its more innovative programs based in principles of community development. Reflexive practice may at least identify some key areas of frame convergence.

This reflection must include the frames that direct research, which goes to inform governance and policies. Much of the fire management research literature also follows an institutionalised framing of fire management as an issue of risk or emergency management. For example, although there is an important growing body of social research, the fire management literature is still dominated by work examining emergency response planning and implementation, and on fire behaviour. Very little of the fire management literature addresses the policy sector as a whole (some of the notable exceptions being Dombeck et al. 2004; Gill 2005; Lavorel et al. 2006). In Australia, there is scant fire related research literature that takes a DRR perspective and considers underlying drivers of vulnerability. Where it does exist, such work often concentrates on a singular policy approach, such as 'community engagement'. This fact alone suggests that for research to encourage adaptation in the fire management sector, the research community itself needs to conduct more holistic work—expanding their own often disciplinarily defined frames. In the context of CCA, most of the published literature has, to date, focussed on climate science, the likely increase in weather conducive to bushfires and the narrowing of windows of opportunity for prescribed burning. There is a nascent body of work exploring the implications of climate change for biodiversity through its interaction with fire regimes. While research that considers social-ecological adaptation to climate change in the context of fire management is virtually non-existent. As has been repeatedly espoused in much of the literature, there is much to be gained in an exchange and mutual learning between the fields of DRR and CCA.

Another more difficult, but arguably necessary action DRR sectors might take to build their and their communities' adaptive capacity is to begin to address their informal institutional landscape. While reflexive learning asks us to expand our purview, to actively consider and perhaps include a more diverse array of frames, it may be challenging to introduce different frames that challenge or do not 'fit' with the sector's current informal institutional landscape. For example, the current study bespoke an institutional landscape underpinned by broader societal ideas of control over nature and the well-worn rational model of public administration. Consequently, attention is given to approaches and frameworks perceived to have a degree of certainty or control, including an emergency management frame focussed on controlling 'the hazard' through suppression or fuel management. Exploring the sector's issues from a polar-opposite frame that (hypothetically) suggests fuel reduction contributes nothing to overall community safety or resilience would likely be ignored and probably scorned within this sector.

A key lesson from this research is perhaps an old one. There is no single answer or solution to the societal challenges of DRR, let alone adapting to climate change. Certainly, the fire management sector has a suite of policy options within its portfolio. It would be encouraging to see this suite presented and analysed as a whole more often. Perhaps even the idea of 'solution' is misleading when we are living in a changing

climate. Besides encouraging a war-like narrative that conveys a battle for control over nature, bolstering an emergency management capacity is not the end of the adaptation story—nor is it the beginning. It does not encourage us to question where and how we live, and how that may have to continually adapt and change into the future. It certainly ignores the social construction of risk and vulnerabilities. Addressing institutionalised notions of control over nature will likely require a society-wide discussion about the limits of control and the fallacy of the idea of certainty—something that is becoming increasingly important as our climate changes. Given that DRR could encompass a social-ecological approach to living sustainably in a landscape of numerous natural hazards, this field may have the emotive power at least to initiate such a conversation.

Using language that draws from and builds upon shared ideas or frames, such a conversation could begin to expand the range of existing policy perspectives. Information presented in forms that affirm rather than denigrate individuals' policy frames and beliefs are less likely to be resisted (Kahan and Braman 2006, p. 165). As such, identification of areas of frame convergence or overlap is pertinent. Human safety should be an equally explicit and central part of the discussion as ecology. The concept of a sustainable future could combine risk management efforts with those aimed at vulnerability reduction and ecological conservation. Connection of different frames into a jointly meaningful story can generate motivation and commitment for collective action and, provided participants are able to deal with the variety, confers the potential for crafting innovative solutions (Dewulf et al. 2011, p. 52). Visioning of a sustainable future might include increased adaptive capacity and reduced vulnerabilities of our social and ecological systems to inappropriate fire regimes, including bushfires.

Finally, in policy sectors such as fire management, where hazard events are touted as 'windows of opportunity' for learning, such events will only provide opportunities for reflexive learning and adaptation when the learning process is genuinely girded by attempts to appreciate the underlying drivers of vulnerabilities and the frames and institutions that guide overarching objectives. As the findings presented in this chapter have indicated, without a frame reflective basis, so-called 'windows of opportunity' may simply serve to reinforce existing policy paradigms that have yet to embrace the nexus between natural hazards planning and climate change adaptation.

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