National leadership: how a change in thinking about vulnerability and systemic disaster risk is shaping nation-wide reforms and national programs of work in Australia*

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Introduction

The Australian Government Department of Home Affairs, through a National Resilience Taskforce (NRTF) and Emergency Management Australia (EMA), led a forward-thinking approach to learn about what makes Australia vulnerable to disaster, create new knowledge and practical advice on how to better understand complex, systemic risks and engage all sectors of society in disaster risk reduction. The results of this informed Australia's National Disaster Risk Reduction Framework (NDRRF). The NDRRF was endorsed by the Council of Australian Governments in March 2020. The NDRRF establishes a strategic foundation for reform, taking a whole-of-society, systems and values-based approach. This work anchors the development of new disaster risk and resilience strategies, policy goals, capabilities, and competencies across all sectors. The new Australian Government National Resilience and Recovery Agency established on 5 May 2021 is continuing to lead and build on this foundation.

In this paper, practical examples are provided of how as a nation, Australia is actively learning to navigate governance and capability challenges to create environments in which all sectors are enabled to reduce complex systemic risks. This paper describes the journey that began in 2016 with a study that set out to align, inform and shape national policy objectives and capability development through the research and construct of a new national narrative. The new narrative sought to help better explain Australia’s vulnerability to events described as severe to catastrophic. This paper explains how reframing disaster provides a new way for leaders to think and talk about systemic climate and disaster risk. The narrative extends the predominant focus beyond the occurrence of natural hazard events in Australia to include systemic vulnerability and new approaches to disaster risk and resilience assessment.

Authentic and inclusive processes, such as co-design and knowledge co-production, were used to facilitate multi-sector engagement. These processes proved to be highly effective in bridging governance challenges and creating new collective impact networks across jurisdictions, agencies, and sectors within Australia. They also enabled the co-creation of new narratives, capabilities and tools to help leaders make decisions in rapidly changing and complex environments. This paper outlines how leaders are being equipped to: have clarified understanding of the disaster risk system (also known as the interconnected systems of society); find points of intervention to address the underlying causes of disaster; and, champion people, ideas and processes to enable activities, such as assessments, engagements or decision-making, to be done differently. It also describes some of the challenges for leaders and the desired attributes of leaders pursing disaster risk reduction objectives.

The specific policy actions that are detailed in this paper include the NDRRF framework establishing a common agenda supported by the National Action Plan(s) (NAP) and the monitoring, evaluation and learning framework (MEL); new knowledge on systemic disaster risk; guidance for repositioning practices for better decisions; and, ways to understand systemic vulnerability, values, behaviour, choices and trade-offs. Parallel to these, it describes the challenges for reducing systemic disaster risk in Australia, and the key findings, lessons and insights that emerged from this work.
Investigating the need for a national risk statement

In 2016, when the study commenced, Australia was experiencing a concentrated spate of concurrent and compounding natural hazards that threatened to exceed the limits of the nation’s emergency response resources and capacity. Examples include the Canberra Bushfires (2003), Victoria Black Saturday Bushfires (2009), Queensland Floods and Tropical Cyclone Yasi (2011) and the severe weather events that triggered widespread asthma attacks in Victoria and shut down power supply to the state of South Australia in 2016. Since then, Australia has experienced extensive and extended drought conditions, the worst bushfires on record in 2019-20, the East Australia floods (2021) and the COVID-19 pandemic.

Although these events were extraordinary, they are not unpredictable or unimaginable. Through these events and others, greater attention was drawn to the need to improve existing emergency and disaster capability planning and risk management arrangements to address the complex challenges presented by catastrophic events, whether present or anticipated future. Unprecedented events often roll out from a confluence of trends and extremes. In thinking about the problems associated with severe to catastrophic events, simply applying more of the same is either not possible, not enough, or may make little impact. The difficulty in thinking beyond current knowledge, skills, experience and imagination was recognised as a limiting factor (AFAC and AGD, 2016; Crosweller, 2015a, 2015b).

It was in this context the development of a ‘national risk statement’ was proposed, that would leverage natural hazard risk information to contribute to enhancing national preparedness for severe to catastrophic events and to prioritise risk reduction efforts. The Australian Government began to investigate the development of this statement as a national initiative.

The project began with an executive imprimatur of: no limits to thinking; ask the profound question; and use different techniques to engage and develop the statement. This unique opportunity provided the space to think deeply and freely, and openly engage with stakeholders across sectors of the Australian economy. The study commenced with an exploration of:

1) What purpose would a national risk statement serve and who would use it?
2) If credible hazard-based information already exists, what is missing?
3) Is national risk-based information needed to prepare for an uncertain future?

Early investigations targeted the nature and availability of information specifically for severe to catastrophic risks at national, regional and local scales in Australia, and a literature review of national risk statements internationally. It was found that understanding hazard risk and emergency management have been the primary focus of efforts at the state and local government levels in Australia. An excellent body of knowledge exists on natural hazards, such as bushfire, flood, storm, and tropical cyclone, and their historical behaviour, especially where the hazards occur with higher likelihoods of occurrence. Existing risk assessment and management approaches are useful for some natural hazards and categories of risk, for example with known and unchanging risk profiles. However, existing approaches are inadequate in dealing with cumulative and cross scale issues, or situations where the risk profiles are changing in unpredictable ways and where likelihood is low but the consequences are catastrophic.

As the study progressed, the following concepts were identified and included: 1) that risk reduction is a critical factor in creating safer environments so that more people would have
the opportunity to exercise resilience to the extent they are able; 2) that safety was predicated on minimising the potential for harm and to achieve this, vulnerability needed to be directly addressed as the key element of any disaster risk reduction strategy; and 3) there is benefit in building a knowledge base to better understand the systemic drivers of vulnerability and the decisions and choices that create disaster risk.

The distinction between vulnerability-based, and standard risk-based (likelihood x consequence, as found in ISO 31000) approaches was considered, particularly in relation to thinking about extreme events from a political and policy perspective (Sarewitz et al. 2003; Wisner et al. 2004, 2011). Specifically, the implications these approaches and framings might have for generating actionable and practical knowledge to enhance national preparedness for severe to catastrophic events was drawn out. Policies to reduce the impact of disasters require a clear-eyed view of the limits of predictive science for guiding the way to an uncertain future and need to focus on the design of healthy decision processes that are sufficiently flexible and promote reflexivity and learning to inform adaptations in response to rapidly unfolding and uncertain contexts (Sarewitz et al. 2003). Numerous approaches to support this have been developed and demonstrated to be effective (Stirling & Scoones, 2020; Voss et al. 2009).

The influence of a changing climate on current and future natural hazards in Australia was also considered. The climate is warming at an unprecedented rate causing non-linear change and high levels of uncertainty and ambiguity in the earth’s climate, weather and ecosystems (Steffen et al. 2018). Therefore the stability of natural, social and economic systems is no longer able to be taken for granted. Many aspects of our livelihoods and what we value, is being tested and reshaped. The potential for harm is increasing, and as disaster risk grows and as dependence on hyper-connected systems increases, the capacity of households, communities, industry and governments to be resilient diminishes. This is the case for sudden-onset and slow-onset events. Although the effects of hazards are expected to become worse, it is generally agreed the social, cultural, environmental, and economic risks are far-reaching, foreseeable and actionable.

The global move towards understanding drivers of disaster was also investigated, along with the increasing convergence across three international frameworks to which Australia has made commitments: The Sendai Framework for Disaster Risk Reduction; the United Nations Sustainable Development Goals; and, the United Nations Framework Convention on Climate Change Paris Agreement. Importantly, progress against all of these is essential to deliver a resilient and sustainable Australia, and new knowledge and practice is needed to create connections between them. Disaster management is a key aspect of climate adaptation and sustainability (Jones et al. 2011; Kelman et al. 2015; Kelman, 2017; Regmi et al. 2019; Golnaraghi et al. 2016).

Further, as the insurer of last resort, the growing costs are ultimately shouldered by the Australian taxpayer through state and federal governments. These costs are becoming increasingly unsustainable and have fiscal implications for a range of other priorities, such as health, education and security. Our research recognised that a focus on economic cost can distract the focus of policy and investment away from the human and natural dimensions of disasters, particularly the loss of things that are valued for which there are no commensurable substitutes and the costs to individuals in terms of increased human suffering and sense of loss (Barnet et al, 2016; Magee et al, 2016; Tschakert, 2017). Wisner (2004, 2011) recognised that the desire to better understand risk emerges, to some extent, from compassion for those who suffer. However, not much is known nationally about what peoples’ preferences and value
priorities are when at risk of being severely impacted or lost (Tschakert et al. 2017; UNFCCC, 2013). This knowledge is increasingly important for setting objectives for managing disaster risks and for leaders in reducing suffering and upholding public trust and confidence.

Finally it was evident there is an urgent need for national leadership and access to trusted information to guide investment to address climate and disaster risks. Investors want clarified understanding of these risks to appreciate the longer-term implications for their investments and respond to the growing pressure from regulators and shareholders to disclose exposure, vulnerability and how risks are being mitigated. All of these elements compound to greater demand for credible and trusted information on disaster and climate risks from trusted sources, including governments.

The strategic case for a new narrative

It was evident that a ‘national risk statement’ would not provide leaders and decision makers with the practical information and understanding needed to justify and communicate policy and funding changes to enhance preparedness for severe to catastrophic events or reduce disaster risk (Australian Government, Department of Home Affairs, 2017). It would also not sufficiently recognise the nature of relationships that leaders have with those around them. This recognition of relationships is important in defining or protecting what is of value to individuals and communities and in working through value differences - as a moral responsibility (Crosweller & Tschakert, 2019). This realisation resulted in a pivot to the creation of a new narrative for Australia. The study question formulated to create a contemporary narrative was: ‘What makes Australia vulnerable when severe to catastrophic events impact what people and society value?’

The term ‘natural disaster’ is widely and often used throughout Australia to describe events that result in widespread loss and harm to communities, the economy and the environment from natural hazards. However, in most circumstances disasters are not ‘natural’ but the result of accumulated decisions made by societies over time (Wisner et al. 2004, 2011). The term consistently diverts attention from the root cause of disasters, such as the behavioural, regulatory, and institutional factors that create and often transfer risks to those least able to deal with them. Additionally, it emphasises naturally occurring hazard events as the focus and source of blame for impacts and loss, misleading people to think the devastation is inevitable or simply part of a natural process (Blanchard, 2020). Such use can also disempower people, increasing feelings of helplessness in being unable to control the outcome/hazard. This results in missed opportunities to progressively ‘take harm out of the system’ through targeted policies and funding that reduce the underlying causes of disaster. It increases expectations for all individuals and communities to be resilient, regardless of their capacity or otherwise to

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1 This demand is driven by recent international and domestic developments. The G20 Taskforce on Climate Related Financial Disclosures, the Australian Prudential Regulatory Authority (APRA), the Australian Securities and Investments Commission (ASIC) and the Reserve Bank of Australia, are all demonstrating that they are taking the issue seriously and expect businesses to do so as well. Legal opinion of one of Australia’s leading commercial barristers, Noel Hutley SC, is that Australian company directors who fail to consider ‘climate change risks’ now could be found liable for breaching their duty of care and diligence under the Corporations Act in the future. The economic importance of disaster resilient infrastructure has been a feature of the G20 over the past year, and G20 leaders are expected to endorse the importance of disaster risk financing initiatives to protect economies from the growing costs of disaster.
exercise their agency that may be constrained by structural, social, or economic factors beyond their control.

In Australia, the notion that disaster resilience is a shared responsibility for individuals, households, businesses, communities and governments was introduced through the ‘National Strategy for Disaster Resilience’ in 2011. It states that individuals and communities should be more empowered to exercise choice and take responsibility for the risks they live with, and that all members of the community need to understand their role in minimising the impacts of disasters, and have the relevant knowledge, skills and abilities to take appropriate action.

Over the last decade, this concept has increasingly weighted institutional responsibility to communities and individuals for risk reduction, preparedness, and safety. Individuals have been incentivised and supported with information from governments, businesses and other sectors to improve their knowledge of how to protect themselves and their families. However, many individuals and communities are not able to exercise choice or take responsibility for reducing risks even with their awareness of the risk transfer. Actions individuals can take are constrained by their agency or ability to influence broader systems. This may manifest, in lack of ownership or access to the required power whether by mandate, regulatory, political authority; or due to assets and resources constraints.

Addressing these more systemic causes of individual and community vulnerabilities requires actors throughout the system to be incentivised and enabled to make decisions that mitigate these underlying causes of vulnerability. For example, the provision of most goods and services can be governed by principles and attributes such as availability, affordability, accessibility, redundancy or diversity. These cannot all be satisfied at the same time. Historical and prevailing incentive structures have meant existing supply chains for goods and services in a market-based economy have been developed under a continual drive for efficiency; at the expense of diversity and redundancy. In turn this has led to supply and demand systems that are increasingly vulnerable to disruption or damage when local or international sources of shock occur.

Emergency management agencies are mandated to prepare for and manage the potential and realised damage to exposed and vulnerable communities impacted by hazard events. The high performance of emergency management agencies has established high community expectations for service delivery and low tolerance for loss. This is demonstrated in numerous inquiries and royal commissions following disasters that investigate how emergency management arrangements can be improved.

Disaster risks – and the consequences of disruption or destruction – will continue to grow as social, economic, technological, and infrastructural systems become increasingly hyper-connected and interdependent. These trends will increasingly exceed the physical capabilities, expertise, resources and capacities of emergency management agencies to mitigate and manage disasters. Reducing systemic disaster risk and avoiding impacts is beyond just the emergency management sector’s responsibility. While emergency risk management is well-practised, there is a need to support all sectors with authoritative information and guidance to include systemic risk and resilience into their risk management practices.

A compelling alternate narrative was needed to respond to a growing sense of unease and uncertainty around changing hazards under climate change and the increasing exposure and vulnerability of society to disruptions. A new narrative needed to motivate, inspire, and empower a transformational whole-of-society change in to action. It needed to provide
empowerment and agency, based on deeper understanding of the underlying causes and effects of vulnerability and bipartisan acknowledgment of, and calls for, better understanding and revisiting roles and responsibilities for mitigating disaster risk.

Meadows (1997) recognises that while it may be the hardest to do, the most powerful place to intervene in any system is to change the mindset or paradigm. The application of narratives that help leaders explain difficult concepts and inspire change is recognised an important part of this intervention. Targeting how disasters are framed provided an opportunity to equip leaders with a different mindset and contemporary narratives to create safer environments and uphold public trust and confidence through the systematic reduction of harm and suffering.

An understanding of values was central to the development of a new narrative. However, understanding vulnerability from a systems and values perspective did not exist when this work commenced, neither domestically nor internationally. There was no ‘blueprint’ (i.e. comprehensive coherent set of frameworks, concepts, methodologies, tools and processes) to guide coordinated and collaborative efforts across levels of decision making and multiple sectors, and nor was there governance arrangements to legitimise and enable such an approach.

Despite the multitude of unknowns and constraints in the pursuit of what was seen as an ambitious project, the value of reframing the disaster narrative created an anticipatory environment - that it could reveal opportunities to do more than change at the margins. Consequently, the team was encouraged and supported by stakeholders throughout the narrative’s development.

**Methods of co-design, co-production and co-ownership**

The knowledge, expertise, and processes to legitimately construct alternative credible narratives does not exist in any one individual, agency, or sector. In August 2017, EMA partnered with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to co-develop a bespoke participatory approach to collect and analyse data and establish the evidence base for the new narrative, and co-design stakeholder engagement. The methodology draws upon social science methods described by Wyborn (2015), Wyborn, et al. (2015) and Jasanoff (2004) and is comprehensively described in O’Connell et al. (2018a, 2018b) and Australian Government, Department of Home Affairs (2019).

High levels of uncertainty and ambiguity associated with a changing climate and increasingly complex and interconnected socio-technical systems, requires more inclusive forms of knowledge co-production and use to support more coordinated (systems-based) and collective (values-based) decision-making.

The project used a collaborative, transdisciplinary and multi-agency, co-design approach to develop the narrative with those who own and manage disaster risk. Intentionally, this approach transcended traditional silos and boundaries between decision-making levels, disciplines and sectors. In doing so, the development of the narrative drew upon the experience, perspectives and priorities of individuals from across all levels of government, peak bodies, private industry, socio-economic sectors, academia, business, non-government organisations and communities.

The uncertainty and ambiguity inherent to the problem and context necessitated this differing approach to project management normally used in public agencies. The project was supported
by an explicit model for social change, often referred to as a theory of systemic change (Abercrombie & Thomasoo, 2018; Aragon & Macedo, 2010; Westley et al. 2009). Due to this, the project activities to create the narrative were themselves designed to intentionally help stimulate change. The ‘theory of change’ helped make explicit the hypotheses and assumptions of diverse stakeholders about how and why desired changes to the emergency management and disaster resilience systems might work. This provided an articulation of the pathways to impact. A monitoring, evaluation and learning framework tracked the systemic change attributable to the project activities to provide ongoing steering mechanisms based on rapid measurement and learning. The entire approach reflected a new way of working at an organisational level for EMA and was enabled by high-level leadership, trust and flexibility from the executive management in EMA.

Consequently, the stakeholder engagement was purposefully designed to: drive systemic change; identify and enable champions of change; and, build capacity and confidence of all leaders, whether formal, informal, local or national, to take action and do things differently. This engagement had two principal objectives and products to deliver:

New knowledge, in the form of stories, concepts, understanding, narratives and/or data, about key drivers of vulnerability from a wide cross-section of people through workshops designed for this purpose; and,

A national vulnerability profile that reflected inclusive understandings of the complex interdependent nature of the causes of vulnerability, the roles and responsibilities for tackling these, and hope and agency for driving change.

The initiative involved and openly welcomed many additional enthusiastic collaborators with several commonalities. Participants believed more could and needed to be done; were open to growth and learning; queried the status quo; were keen to empower and inspire others; and they talked about systemic risk in a sensitive, compassionate and constructive way.

National leadership and project design were two crucial factors in the level of engagement experienced. The convening power of the Federal Government, active participation of the States and Territories, and a broad range of participants who engaged with enthusiasm and authenticity, allowed for the creation of new networks. In addition, active participation and sponsorship by senior and executive leadership of organisations provided an authorising environment for participation.

Project development workshops were designed to: elicit values and value priorities, differentiated as before, during and after an event; elicit how value priorities change between periods of stability and disruption; and, unpack the direct and indirect causes and effects of vulnerability across a range of issues, such as energy, communication, community preparedness, land-use planning, education and learning, health services. These workshops called upon lived experience and place-based knowledge. They adopted best-available science about eliciting systems understanding, stimulating futures thinking, revealing values and priorities under diverse contexts, and fostering acceptance of diversity. Approximately eighty cause-and-effect diagrams and associated stories of lived experience were generated that underwent extensive synthesising and sense-making. The approach and methods are repeatable, adaptable, and results for co-producing a systems understanding of disaster is fully detailed in O’Connell et al. (2018) and O’Connell & Grigg (2020) where they can benefit others.
A new narrative about the interconnected causes and cascading effects of systemic disaster risk

The major output synthesising the results of the collaborative work undertaken to understand what makes Australia vulnerable when severe to catastrophic events impact what people and society value is detailed in Australian Government, Department of Home Affairs (2018). This report titled *Profiling Australia’s Vulnerability: the interconnected causes and cascading effects of systemic disaster risk* provides an inclusive large-scale view of what makes Australia vulnerable to disruption from natural hazards. It is designed to be relatable and relevant to all sectors, all levels of decision making, and all types of communities.

It provides a common language, vocabulary and framing to help leaders talk about vulnerability and open avenues for inclusive conversations about what can and needs to be done to mitigate this. It is a product of inquiring more about ‘why’ and ‘how’ some naturally occurring events lead to devastating suffering and loss, as seen through the experiences of people and their values. Understanding vulnerability in this way provides a lens that can be applied to different places, across different scales, levels and contexts. It takes a high level, ‘big picture’ systems view because at this level commonalities, patterns and trends can be identified across all jurisdictions or sectors, and where national leadership is needed most.

The report identifies a range of factors that shape individual and collective vulnerability. It begins to distil the complexity of systems into something that people can engage with and understand intuitively. For example, stories from a systems lens convey typical system patterns, feedback loops and value tensions which may be in play regardless of the type, location or timing of a disaster. Typical system patterns include but are not limited to: the placement of communities, infrastructure and assets; access and supply of essential information, goods and services; risk assessment, ownership and transfer; and the institutional and organisational arrangements governing decision-making.

The report narrates how risk and vulnerability are created, transferred and experienced during disasters. It includes narrated stories of lived experiences and the values affected or lost. These stories and the system patterns highlight that tensions or conflicts in values can arise between different parts of society and between different roles within organisations. The tensions and trade-offs between values are described in detail and include tension between: a prosperous now versus a prosperous future; ourselves versus others; blame versus learning; stability versus change; people versus planet; tangible versus intangible; and liberties versus regulation (Figure 1).

The report also explains that the relative importance or priority of values can change radically at times of hardship or disruption compared with those prioritised during stable times. Natural hazards have a way of temporarily, and potentially permanently as they become increasingly catastrophic, sharpening into focus the things we value most and often assume will always be there. The values can include a sense of security, safety, normalcy, self-efficacy and a lack of trauma to both people and nature.

Better understanding the state and dynamics of vulnerability through a systems and values lens provides a greater opportunity to tackle the root causes. Through this perspective a range

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of potential points for intervention can be revealed to come up with new solutions to complex problems to create safer environments.

Figure 1. Values that are in tension and cannot be reconciled at the same time – choices and trade-offs are necessary (Australian Government, Department of Home Affairs. 2018).

Similarly, exploring the different ways the future could unfold using quantitative (i.e. climate scenarios) and qualitative (i.e. aspirational and exploratory) scenarios can help determine what values are at risk, and can support better decisions in the present to minimise regret. Balancing decisions for immediate gain and benefit against a long-term gain or potential benefit is challenging, even on a personal level. For example, Goldstein (2011) recognises that everyone struggles in making decisions that are good for the long term and describes the battle between the choices we make between our present and future self. The uneven balance between these – created by uncertainty and prevailing incentives (Underdal, 2010) – can often lead to regret, and being supported to better understand and manage these tensions and potential trade-offs can lead to more equitable outcomes across timeframes. The challenge is to have the necessary foresight and commitment to find a balance and to monitor and adapt as the context changes.

Competencies and assessment processes required of people and organisations to more effectively identify, evaluate and act on these value tensions include being able to: undertake inclusive and authentic engagement and collaboration; imagine and explore plausible futures including articulations of desirable well-adapted visions; assess what is important to diverse stakeholders and the values at risk due to uncertain threats; and identifying, evaluating and adaptively implementing the potential trade-offs between options and pathways to steer towards the vision or avoid undesirable outcomes. Since these are not widely required or
consistently practiced, there is need for ethical and systems leadership to provide the authorising and enabling environment for these assessments to be done and competencies to be built (Wise, 2018; O’Connell et al. 2019; Australian Government, Department of Home Affairs, 2019; Bandura, 2018; Avenharju et al. 2018).

Significantly, profiling systemic vulnerability recognises everyone and everything is vulnerable to the affects or disruption caused by severe to catastrophic events. Often vulnerability is mistakenly perceived as a sign of weakness, with a tendency to downplay personal and institutional vulnerability. People of affluence or in power often struggle to contemplate their own vulnerability and many individuals and communities do not like to be considered or labelled in this way. Such denial or disavowal results in the inability of those in power to see the vulnerability of others, and this in turn shapes the extent to which vulnerability is addressed in policy making and program management (Crowseller & Tschakert, 2020). Vulnerability also often lies in the shadow of risk, and in many cases the concepts are integrated (for example, through risk being defined as the function of hazard, exposure and vulnerability) leading to a loss of focus on vulnerability itself as being a distinct contributor to the outcomes that we seek to avoid (Sarewitz et al. 2003) and contributing to a long-standing bias toward hazard-focused research and policy (Wisner et al, 2011). Accepting that everyone is susceptible to harm or vulnerable to systemic risks, opens a broader range of pathways to reduce this vulnerability. It is therefore important to shift mindsets to acknowledge that vulnerability is a strength, and that recognition of vulnerability is a critical first step and opportunity towards creativity, innovation, and change (Brown, 2012). These significant views were intended to be captured in the final publication.

The utility of the new narrative and changing mindset

The Profiling Australia’s Vulnerability report and the processes used to create it continue to be a catalyst for change across many sectors. This is demonstrated with the systems narrative being further developed and contextualised by the Queensland State Government. Their work built on the premise that changing the ‘mental models’ of decision-makers is key to supporting systemic change (Queensland Government, 2021; O’Connell et al. 2020a). The approach recognised the challenges in successfully communicating complex systems narratives to different stakeholders. It also embedded recognition that evaluating how a narrative is used, by whom, and for what purposes is necessary to underpin the ongoing adaptive system-wide efforts to catalyse and enable systemic disaster risk reduction.

The Queensland Government and CSIRO co-created a range of infographics and diagrams to provide a flexible ‘storyboard’ characterising the disaster risk system to help in understanding how and why many existing rules incentivise choices that create disaster risks and what needs to be done to change this. The ‘overarching systems’ or the ‘big picture’ narrative is one example of these and is summarised in Figure 2 and Box 1.

The recent period of relative prosperity and stability has allowed societies to design systems and prioritise outcomes that are only possible or valued because of the relative stability of

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3 This is the recent 16000-year period of relative stability of the climate (for many reasons), which has allowed and incentivised humans to develop agricultural and other practices the way we have, and to build in places which are now becoming unsafe. In addition to this, there has been a period of relative social stability and prosperity in Australia since the second world war, and this incentivised economic efficiency and cost minimisation (rather than surplus or buffers in the economy), which in turn exacerbates vulnerability.
climate and the abundance of resources relative to human demands. However, these systems and outcomes are ill-equipped and unfit for purpose in unstable and resource-constrained situations. In other words, the cumulative choices and decisions that have been made in times of relative stability contain the seeds of vulnerability to disaster. Given the current trajectories for climate change and other chronic stresses, many systems will be unable to continue delivering the services and outcomes that people value. In this context, there are three different pathways or ways of thinking, deciding, and acting that are available: a) doing things the same, b) doing things better, and c) doing things differently. Each would result in different outcomes, points of intervention, and require differing decisions and actions. Although some parts of the system may be able to continue to deliver on goals by ‘doing the same’, the inevitable changes and disruptions of the future mean that effort must be substantially shifted to ‘doing things better’ and ‘doing things differently’. Undertaking recurrent evaluation can help identify existing approaches, tools and processes currently practiced, and ascertain whether these are sufficient to meet the anticipated nature and magnitude of future climate and disaster risks. For example, a ‘Resilience Checklist’ was developed that assists in the discovery of what ‘Doing things differently’ looks like. This checklist supports collaborative action without imposing a ‘top down’ or mandated methodology on stakeholders who require freedom to operate to also meet more specific portfolio-based objectives (O’Connell et al. 2020b).

Figure 2. An illustrative form of the overarching disaster risk reduction systems narrative (Queensland Government, 2021; O’Connell et al. 2020a).

Box 1. A summary of the overarching disaster systems narrative elements (O’Connell et al. 2020a).

A systems approach is needed to create futures that are disaster-resilient and adaptive to change. This systems approach entails: understanding causes and effects, identifying points of leverage, and strategically choosing between three pathways of action namely ‘Doing the same’, ‘Doing better’ and ‘Doing differently’.

- People, as individuals or groups, hold diverse values and prioritise things of value differently, depending on the context. There are often tensions in these values, so that trade-offs need to be made according to priorities at individual, group or societal levels.

- Decisions and actions at individual and societal levels reflect complex processes in which tensions in different values and knowledge types are managed and trade-offs are made. Decisions are only likely to be adaptive and effective where values, rules and knowledge align.

- Cumulative choices about values, rules and knowledge shape our systems (i.e. systems that supply food, water and energy, or provide services in health and finance).

- The system works well in times of stability and prosperity (especially for those in a position to benefit from current system configurations), but contains the seeds of vulnerability to disruption.

- The world now faces rapid, unprecedented changes in terms of their magnitude, scale, complexity and uncertainty.

- When disruptions happen, the system experiences cascading impacts, and can suffer catastrophic damage to lives, livelihoods, infrastructure and ecosystems.

- During a disaster, communities, businesses and government agencies tend to work well together with clear roles, responsibilities and priorities (for example for primacy of life). However, after disaster people prioritise what is valued differently from before and there is a set of choices about the pathways forward.

- In a ‘Doing the same’ pathway, recovery aims to re-establish the status quo as quickly as possible to replace what was lost or damaged. This reinforces existing vulnerabilities.

- In a ‘Doing better’ pathway, reconstruction focusses on ‘betterment’ of infrastructure, and improved preparedness of communities and businesses. There are also efforts to do things better before a
disaster and while this helps, it does not fundamentally change the structure of the system and vulnerabilities remain.

- In a 'Doing differently' pathway, post-disaster recovery periods create windows of opportunity for using the shifts in what is valued, or in what has been lost, to create large, transformational changes.
- People commonly reprioritise or clarify what they value when life is disrupted. Understanding how values shift when life is disrupted is vital for reconfiguring our systems so that they better support what really matters in times of crisis.
- A shift in values can create the need for new, and perhaps different kinds of knowledge, and motivate the development of new formal and informal rules.
- These changes will enable systems to be restructured or reconfigured differently, which if done well can create opportunities and limit cumulative risk and cascading negative impacts.
- This will help to create more sustainable systems, resilient to disaster and adaptive to future shock, and serve shared, long-term societal values whether there is a disaster or not.

The challenges in reducing systemic disaster risk

Australia's susceptibility to disruption will continue to increase because of the systemic nature of disaster risk. There are many interacting rules such standards, regulations, policies, norms, and cultural and disciplinary practices, that promote decisions to pursue the values of efficiency, optimality, productivity, convenience and profitability - often at the expense of values of resilience, redundancy and robustness.

There are already substantial numbers of people, assets and economic activities in areas that are highly exposed to natural hazards. This is largely because of decisions made in the past. However, exposure and vulnerabilities are growing in these and new areas. The reasons are twofold. The first is that there are positive feedbacks or self-reinforcing mechanisms that are associated with developed areas. A path dependency is established when urban areas are developed, and jobs and services continuously attract more people and more investments. The second is that decision-making processes can be slow to accommodate the changing behaviours and distributions of hazards. For example, changes to building codes, existing land-use planning and other decision-making processes struggle to adequately or otherwise quickly account for the uncertain and dynamic nature of natural hazards under climate change.

Additionally, climate change itself is driving fundamental changes to our natural environments, agricultural zones, and coastal processes which will exacerbate Australia's economic and social vulnerabilities. It is unclear how these systems will change and it is not possible to predict with certainty. There is a pressing need to explicitly learn how systems are changing, what this means for management objectives, and how effective novel responses might be in dealing with changes. These changes and challenges will create new tensions and potential conflicts between various stakeholders as many of the things currently valued and taken for granted will become increasingly threatened, degraded, or lost. A reality is that we will need to start thinking about, and having conversations as a nation about, which, and whose values we are prepared to protect or let go, and the implications of this. Engaging the issue of climate change will require difficult conversations and substantial investment of time and resources at scales of decision-making we are not used to.
Specific policy actions towards systemic disaster risk management

Strategically and proactively changing complex systems to be climate-adapted and disaster resilient is not easy and will take time. There is a need to understand and use the current system to affect desirable change, which requires coordinated system-wide interventions by many. Meadows (1997) recognises leverage points can vary from the relatively simple and tried-and-tested such as subsidies, taxes, investments to the complex and systemic, in the form of paradigms shifts, often requiring strategically designed and implemented combinations or sequences of both.

Australia has only recently started learning how to coordinate national efforts to understand and address complex systemic disaster risk. The Profiling Australia’s Vulnerability report published by the NRTF created a new systemic disaster risk narrative. This narrative underpins a national policy scaffold that guides transformational actions. The initiatives listed below represent the recent efforts to shift focus to systemic disaster risk reduction in Australia. Critically, these initiatives include a shift in emphasis from individual resilience to targeted system-wide interventions that prevent or mitigate climate and disaster risks, through placing a greater emphasis on institutional responsibilities for reducing risk.

The National Resilience Taskforce (NRTF)

The establishment of the National Resilience Taskforce (April 2018 - June 2019) within the Australian Government Department of Home Affairs was a major catalyst for accelerated change and national leadership. The NRTF piloted new forms of governance, stakeholder engagement and project co-design in a complex and ambiguous environment, embedding specialists from science and industry to lead on research and iterative knowledge brokering and co-production functions.

Leveraging the convening power of government, the NRTF built strong connections and momentum with stakeholders from the financial sector including insurance, superannuation, and other institutional investors, the freight sector, energy sector and community groups, and assisted previously unengaged parts of the economy realise the role they need to play. A broad range of knowledge-bearers were also included, from the arts and humanities, social sciences, behavioural sciences, decision theory and those who represent the community and themselves.

The National Disaster Risk Reduction Framework (NDRRF)

The NRTF co-developed the NDRRF with unprecedented engagement across sectors. Adopted by all Australian governments, the NDRRF establishes the foundational work needed to reduce existing risk, prevent new risk being created and ensure the facilitating information is available. It is targeted to sector and policy leaders and provides a strategic framework for systemic risk reduction efforts that may be delivered within the public and private sectors. This includes work in many areas including land use planning, infrastructure investment, emergency management, social policy, agriculture, education, community development, energy, and the environment.

Importantly, The Hon David Littleproud MP (2020) recognised that “one of the fundamental objectives of the National Disaster Risk Reduction Framework is the least tangible: changing the mindsets of Australians and their approaches to [Natural] Disasters. We need to consider
how to embed resilience into planning, policies, systems and services. We need to ensure a cultural change when it comes to disaster resilience, resulting in a conscious shift in the private, public and policy focus. This requires a serious reflection on our values.

The National Action Plan

A priority of the Australian Government is driving coordinated national action to implement the NDRRF. The inaugural National Action Plan (NAP) brings together initiatives from across sectors into a single picture of coordinated effort (Australian Government, Department of Home Affairs, 2020). Annual NAP iterations will progressively mature to be more strategic and forward looking to drive cultural, behavioural and procedural change. NAPs will facilitate partnerships across business, community, and government to invest in priorities that build place-based resilience and reduce risk. NAPs will continually be informed by the evidence base derived from the Measurement, Evaluation and Learning (MEL) Framework.

The Measurement, Evaluation and Learning (MEL) Framework

The MEL Framework provides a structured way to test the efficacy of policy constructs and activities. It will track the effectiveness of collective national efforts to implement the NDRRF will and facilitate continuous improvement through iterative and adaptive learning about how best to progress the systemic changes needed to prevent new and reduce existing disaster risks (i.e. ‘doing the right things’). It will promote accountability across sectors and strongly emphasise ‘what works’ in relation to the systemic changes required to reduce disaster risk.

The Guidance for Strategic Decisions on Climate and Disaster Risk (Guidance)

The NRTF developed a first tranche of interconnected practical guidance materials to support the implementation of the NDRRF and encourage new conversations about climate and disaster risk (Australian Government, Department of Home Affairs, 2019). The suite of six guidance documents supports decision makers in: how to identify and assess the causes and effects of vulnerability and points to what can be done to reduce these; how to navigate governance constraints; how to consider uncertainty about future climate and disaster risk through scenario thinking and scenario analysis; and, it how to identify, evaluate or incentivise investment options when purpose is to reduce vulnerability as well as create economic impact.

Importantly, the suite of guidance documents speaks primarily to government, industry and influential community leaders (e.g. community-based organisations and not-for-profit agencies). It addresses the primary decision makers (public and private actors) who can influence whether risks are created or reduced and affect their potential consequences and supports them in approaching risk though a systems view. The Guidance illustrates where we are now and where we need to be (Figure 3).

The need for a National Disaster Risk Information Services Capability

The NRTF recognised the demand for authoritative climate and disaster risk information, and a role for the Commonwealth to ensure consistent standards, methods, access and provision of knowledge services to support decision-making. The NRTF developed a blueprint for a national capability that would provide access to reliable, authoritative, governed and trusted information, modelling capability, processes and tools, together with networks of collaborating scientists, technical specialists and decision makers, to develop a shared understanding of the problem and co-development of climate and disaster risk reduction activities. A pilot project in the supply chain and freight sector validated the need for a national capability as a foundational element for implementing the NDRRF and showed a clear benefit for Australian communities and businesses having better decision-ready information and advice (Australian Government, Department of Home Affairs, 2020).

The National forums “The Rise of Disaster Risk Reduction”

A series of forums were held across Australia for more than 700 people in 2019 (AIDR et al, 2019). The forums provided an opportunity to explain and discuss the contemporary thinking outlined in the Profiling Australia’s Vulnerability report, the strategic guidance developed and how they both relate to the implementation of the NDRRF. Ninety percent of forum attendees
reported an increase in their understanding of disaster risk. Proceedings and resources from the national forums are publicly available\(^6\).

**Insights and lessons**

The approach described in this paper incorporates an active learning philosophy and several of the key insights and lessons are could benefit others and are described.

**The most effective way to enhance preparedness for severe to catastrophic events is to address systemic vulnerability**

Understanding the progression of vulnerability (Wisner et al. 2004, 2011) and the underlying root causes of disaster helps realise that, in one sense, disasters simply expose existing and systemic problems. This way of thinking about disaster, combined with values analysis and systems thinking, reveals opportunities for change across sectors to systematically reduce vulnerability and risk.

In Australia, vulnerability is one of the least understood components of risk. It is therefore essential to build a knowledge base and competencies in systems thinking and collective action to better understand and act on the systemic drivers of disaster that create vulnerability. The body of knowledge to incorporate systemic vulnerability into risk assessments is currently evolving in Australia. Deconstructing disasters provides a way to understand the root causes of vulnerability, explore how our systems work in times of stability or times of disruption and as a way to diagnose key points of intervention in the system, how this might be done and who would able to effect that change.

**Balancing value tensions can help reduce disruption and enhance resilience**

In Australia there is a predominant hazard-based and event-focused approach to understanding and managing disaster risk. While managing the impact of natural hazards is critical, it is also necessary to understand and invest in actions that reduce the creation of new risk and vulnerability in society. This requires better understanding and increasing transparency about whose values are being prioritised or traded-off and whose risks are being managed by whom. Our experience has shown that re-prioritising the balance of values which are in tension could be an effective intervention. This requires:

A. investigating which values matter most in disruption, taking these into account when working out how to do things differently to promote more sustainable, climate-adapted, and resilient societies (O’Connell & Grigg, 2020);
B. raising awareness of the conflict between values that promote resilience at times of disaster with existing value priorities (e.g. individualism, competition, efficiency (e.g. just-in-time supply chains) or short-termism);
C. building the evidence of the benefits of cooperation, redundancy and intergenerational equity; and,
D. creating incentives and other mechanisms to rebalance value tensions to enhance disaster resilience.

\(^6\)https://knowledge.aidr.org.au/resources/understanding-disaster-risk-forum-proceedings/
Decision making processes need to address points where the risk of harm is created

Not adequately considering future risks and the causes of vulnerabilities in all stages of decision making facilitates further risk creation, on top of risks already embedded in society and the landscape. Continuing to focus on resilience of specific assets, individuals or communities who cannot influence or control the policy levers needed to reduce disaster risks, is not enough. More strategies are needed, and incentives put in place, to address the socio-economic causes of vulnerability.

To reduce disaster risks and minimise future disruptions it is necessary to understand and address the points along decision-making processes where the risk of harm is created. For example, this can be where people at multiple levels are incentivised to create or transfer risks or where incentives could be introduced to mitigate or prevent risks being created. Examples of this include decisions in planning, developing building standards, designing infrastructure, urban and regional development, and asset management and investments.

Value creation needs to be considered in options and pathways to increase resilience investment and reduce disaster risk

Approaches such as the Resilience, Adaptation Pathways and Transformation Approach (O’Connell et al. 2019) and the Guidance for Strategic Decisions on Climate and Disaster Risk (Australian Government, Department of Home Affairs, 2019) propose methods for generating options and pathways that can take society forward to desired future visions (aspirational scenarios), and ‘stress test’ those pathways to ensure they are robust to climate and disaster risk (probabilistic scenarios) and other sources of uncertainty such as geo-political stability (and exploratory scenarios). However, the whole system that generates strategies, policies and programs as well as pipelines of projects for major infrastructure and other investments generally uses a much more constrained development process.

The current process focusses on delivering service for minimum cost, without adequately considering climate and disaster risk. Economic approaches which employ the principle of ‘value creation’ in the design and development process exist and are used. However, they are rarely combined with adequate risk assessment. By the time a proposal or set of options reaches the stage of detailed economic analysis, the options have already been greatly narrowed. This is because the type of ‘big picture’ strategic thinking required to address the nature and magnitude of change that we face, has not been done.

To be effective in creating additional value (e.g. social cohesion, jobs, natural capital, economic) opportunities need to be identified and exploited that also mitigate risks to avoid loss and suffering. Such opportunities need to be place-based, regional in scale, community led, and investor enabled. A range of approaches to enable resilience investment are in development and demonstration phase (CSIRO and Value Advisory Partners, in press). These methods provide avenues for generating options and pathways. Prospective options, or bundles of them, can then go into a design process for value creation and capture, as well as more rigorous stress-testing for climate and disaster risk.
New leadership qualities and competencies are required to tackle systemic disaster risk

The call for national leadership and public expectations for finding solutions to complex issues is continuing to grow. A rapidly changing risk context poses significant challenges for leaders across sectors that should not only be viewed through the lens of disaster, but through the capacity to shape and influence laws, policies, systems and governance that establish the conditions for sustainable and resilience society.

New leadership competencies and styles are required to catalyse collective action across different scales, levels of government, sectors of industry, and community. For example, overcoming existing biases and moving beyond a business as usual approach requires formal and informal leadership that can be referred to as systems, relational, ethical, adaptive or emergent leadership. The following section explains some insights into the relationship between vulnerability and leadership, the ethics that guided the NRTF in this work and the desired attributes of leaders pursuing disaster risk reduction objectives as well as the effect that individual worldviews can have on organisational leadership.

The denial of vulnerability and self-interest are barriers to achieving best service and best advice

Society expects its governments, institutions and industry leaders to overcome barriers that inhibit problem solving. They expect governments to lead, create knowledge and establish environments in which decisions and actions can be taken that minimize harm and reduce loss. The present and emerging challenges are unlike those of the past – they require a fundamentally new approach to provide the best advice to government and the best service to the public – one of common purpose and integration.

The barriers to achieving best advice and best service are significant. One such barrier within a federated system of government like Australia is jurisdictional self-interest, both at the political and bureaucratic levels. Here, it can often be the case that narratives, discourses, and arguments focus on questions of sovereignty, power, and authority, as well as contestability over access and allocation of wealth and resources. Whilst important considerations within federations, if they become the predominant focus when seeking to formulate effective public policy in climate and disaster risk reduction, opportunities may be lost.

A further barrier is when people deny or ignore their own susceptibility to be harmed and their potential lack of capacity to cope with that harm (Gilson, 2011). This can influence decisions related to systemic disaster risk reduction as the denial of vulnerability can extend across leadership at all levels within the system. For example, by leaders denying their own personal vulnerability and that of their institutions and the societies they are called upon to serve, they put at risk their ability to properly appreciate the presence of vulnerability and its systemic causes. Subsequently, leaders may perpetuate paternalistic and coercive interventions such as legislation and regulation to safeguard the vulnerable (Crosweller & Tschakert, 2019; Mackenzie, 2014).

To contest these barriers, and to help lessen the negative effects of excessive self-interest and the denial of vulnerability, two ethics were found to be useful as a basis to underpin the national leadership of the NRTF. These were: the upholding of public trust and thereby confidence, and the reduction of human and non-human suffering, understood as compassion/non-harmfulness. While significantly complex in their implementation, the ethics
of trust and compassion can remind leaders of their obligations towards a common mission and purpose of negating, minimising, or managing harms and improving the safety of citizens through various strategies of disaster risk reduction throughout all levels of the system.

Embedding these two ethics into a relational leadership framework allows leaders to understand the importance of converting their mission and purpose through recognition of diversity, mutual respect, and community. Relational leadership requires leaders to commit to working with communities to ensure human survival and well-being through relational processes whilst utilising political and government institutions to achieve these objectives (Etzioni, 2015). Social value engagement, understanding the interrelatedness and complexity of human and socio-political behaviour, and treating citizens with dignity whilst recognising their moral worth and innate rights become essential attributes of leaders when pursuing disaster risk reduction objectives (Caro, 2015, Caro, 2016).

Leadership needs to be relational and reflect communitarian approaches to resilience.

Senior decision makers and disaster management leaders are directly responsible for protecting citizens and play an influential role in advising, formulating and implementing policies to strengthen adaptive capacities and enhance resilience (Crosowell & Tschakert, 2019; Okereke et al. 2012). They are also influential in determining the extent to which institutional decisions reduce or increase the vulnerability of sectors, groups, or regions in the context of a climate change (Kelman et al., 2016; O’Donnell et al. 2018; Wisner et al. 2011). However, Crosowell & Tschakert (2020) recognise that in seeking to achieve these objectives, disaster management leaders may be constrained by particular worldviews and perspectives that can emphasise emotion-free and value-free rationality, personal risk aversion, and over confidence in institutional and individual human agency. For example, more individualistic approaches to resilience can place a significant burden on citizens to relieve governments of their obligations for community protection. In this context, citizens are expected to have situational awareness of all risks and hazards, be resilient in all circumstances, take the pressure off response and recovery, and fund their own recovery through insurance or other means. These responsibilities are expected irrespective of a citizen’s capacity to achieve them or the social and economic circumstances in which they find themselves. Conversely, more communitarian approaches to resilience aim to establish governance frameworks that enable diverse and innovative economies and dependable access to community infrastructure. They further enable access to reliable information, functional social networks, and recognise and respect diverse values and beliefs. They also accommodate reasonable requests for assistance from citizens. Crosowell & Tschakert (2020) demonstrate how many disaster management leaders have internalised more of an individualistic understanding of resilience driven by a narrow worldview that downplays vulnerability, which they argue can inhibit organisational effectiveness in reducing human suffering caused by climate-induced hazards.

The challenge, and goal, is to find effective ways to shift the thinking of political leaders, government agencies, industries and businesses, investors, communities and individuals towards a more communitarian approaches of leadership. This approach needs to be premised upon the ethics of trust and compassion as well as an acceptance that severe to catastrophic events render all people vulnerable (albeit not equally). Doing so opens up this shared space of vulnerability to the potential for leaders at all levels within the system to work
through relationality with individuals and communities to create the adaptive and transformative changes that go beyond mitigations of individual risks. Such changes will need to tackle systemic and institutional causes of collective vulnerability so that effective pathways are made through a moral obligation. As well as reducing vulnerability to severe to catastrophic events, these actions also hold the possibility and promise of redesigning systems that can stay within a safe ecological ceiling and based on a strong social foundation (O’Connell et. al. 2018).

The convening power of government can enable systemic disaster risk reduction

Under Australia’s constitutional arrangements, State and Territory governments have primary responsibility for emergency management within their jurisdiction. While the Australian Government has no constitutional responsibility, its convening power can be used to great effect. This convening power is important for connecting all sectors of the economy and is most productive when undertaken in a transparent and collaborative way (i.e. to minimise parochialism or hierarchical control and influence). There is great deal of investment, innovation and effort underway across all sectors and a willingness to come together to find mutually beneficial solutions to complex challenges. To lead and convene effectively in complex, contested and uncertain contexts, certain competencies can help. Our experience, while still a work in progress, has highlighted valued competencies such as visioning, ethical leadership, adaptive learning, systems and values-based thinking, authentic engagement and knowledge brokering.

Adopting an active learning approach is fundamental to success

Our experience has highlighted that working through complex problems requires ongoing learning which is often not adequately recognised or incentivised. To better appreciate the novelty and dangers of disaster risks under climate change, to do things differently and enable adaptability, learning is fundamental. Learning is a continual alignment between the values that guide what we want our future to look like, the knowledge we have to tell us how to best pursue this and the rules that shape what we can and cannot do to get there. There are disconnects due to climate change and growing disaster risks between what we know, what we value and what actions we can take (Gorddard et al. 2016, Wyborn et al. 2016). Pathways to safety can be realised through greater alignment across each of these elements – adjusting the rules, seeking new or different forms of knowledge, or better expressing values. This takes time, guided by purposeful adjustments of decision-making and governance, and underpinned by ongoing active learning processes.

The way information and knowledge are generated matters

Strategic policy making to reduce and manage disaster risk is a role for senior leaders within government and must be supported by advice from a broad range of sources within and outside government. Limiting advice to within government or, worse, within one area or ‘silo’, restricts the ability of all governments to consider and address broader national vulnerabilities and implications of disaster risk (Royal Commission, 2020). Decision makers increasingly need to be supported with transdisciplinary cross sector information that can see problems, issues, or solutions from multiple dimensions of systems and value perspectives. Our experience demonstrates the value in adopting authentic and more inclusive forms of knowledge co-production and multi-sector engagement.
Conclusion

This paper describes how a change in thinking about vulnerability and systemic disaster risk is shaping nation-wide reforms and national programs of work in disaster risk reduction in Australia. It has introduced new knowledge and practical advice on how to better understand complex, systemic risks. It offers a practical example of a nation learning to navigate the governance challenges and implement strategies to address complex, systemic risks. It is focused on national leadership and described the styles and competencies of leadership that are useful for convening in contested and complex environments. The overarching approach and underpinning processes, methods, outputs and outcomes of applying them have been described. All of these have contributed to an emerging shift in the way disasters are conceptualised, language and narrative is used, policy frameworks are formulated and applied, dialogue spaces are convened and trust is built. Our experience acknowledges the pragmatic challenges while also providing evidence-based ideas and guidance for what we know works to help do this.
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Consider: developers, governments and residents. Real estate developers might value land and housing for economic returns. Governments might value land for this reason, and to meet need of a growing population. Residents, on the other hand, might value their house as a source of security and stability and value the area where they live because of the life experiences they have had there. On a daily basis, these value differences may not matter much and different ways of valuing something may comfortably co-exist. However, if circumstances change, problems can arise if some of these ways of valuing something are given greater weight and prioritised over others. If the economic returns from housing and land sales are given greater priority than the security and sense of place that housing and locality can provide, land development will be allowed to occur in places that are at risk from natural hazards (e.g. on floodplains).

The key messages are that: Institutional processes can create cycles where risks are created in one sector and transferred to others. Some are exposed to risk for a small window – and transfer long term risk to others – residents, insurers, governments and emergency services Things like regulations, standards and services step in to manage trade-offs If disaster strikes, consequences are rarely attributed to the decision that generate the risks. This creates perverse incentives for continued risk generating behaviour. Sometimes those who gain from risk rarely bare the cost, which can result in missed opportunities to mitigate and missed opportunities to take harm out of the system. This can lead to patterns where new risks are being generated faster than existing risks are being reduced.