

Systemic Disaster Risk



Australian Government
National Recovery and
Resilience Agency



Australian Institute for
Disaster Resilience

AUSTRALIAN DISASTER RESILIENCE
HANDBOOK COLLECTION

Systemic Disaster Risk

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Australian Disaster Resilience Handbook Collection

The Australian Disaster Resilience Handbook Collection provides guidance on national principles and practices for disaster resilience.

The Handbook Collection:

- provides an authoritative, trusted and freely available source of knowledge about disaster resilience principles in Australia
- aligns national disaster resilience strategy and policy with practice, by guiding and supporting jurisdictions, agencies and other organisations and individuals in their implementation and adoption
- highlights and promotes the adoption of good practice in building disaster resilience in Australia
- builds interoperability between jurisdictions, agencies, the private sector, local businesses and community groups by promoting use of a common language and coordinated, nationally agreed principles.

The Handbook Collection is developed and reviewed by national consultative committees representing a range of state and territory agencies, governments, organisations and individuals involved in disaster resilience. The collection is sponsored by the Australian Government Department of Home Affairs.

Access to the Handbook Collection and further details are available on the Australian Disaster Resilience Knowledge Hub: www.knowledge.aidr.org.au/handbooks

Australian Emergency Management Arrangements

Community Engagement for Disaster Resilience

Communities Responding to Disasters: Planning for Spontaneous Volunteers

Community Recovery

Disaster Resilience Education for Young People

Emergency Planning

Evacuation Planning

Flood Emergency Planning for Disaster Resilience

Health and Disaster Management

Lessons Management

Managing Exercises

Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia

National Emergency Risk Assessment Guidelines

Land Use Planning for Disaster Resilient Communities

Public Information and Warnings

Safe and Healthy Crowded Places

Systemic Disaster Risk

Tsunami Emergency Planning in Australia

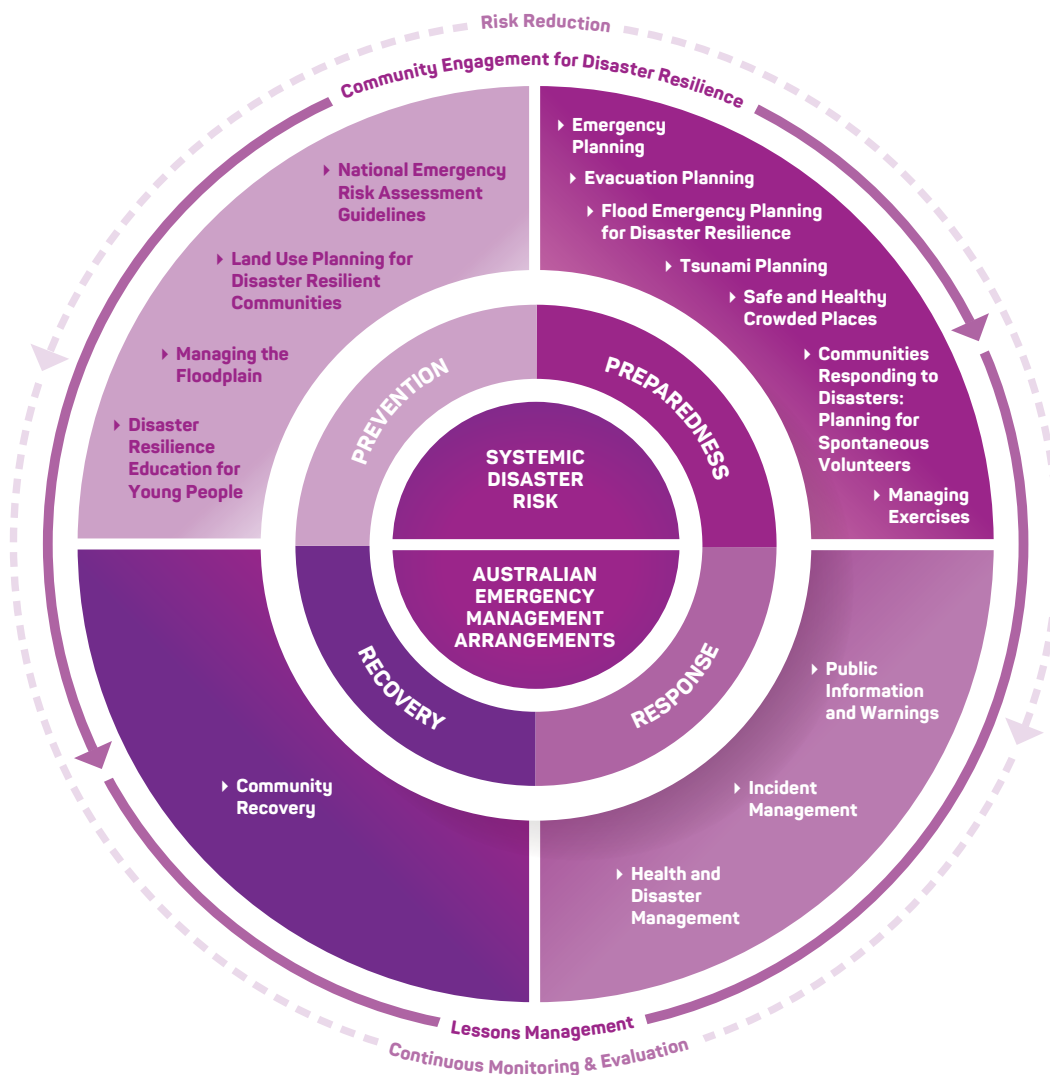
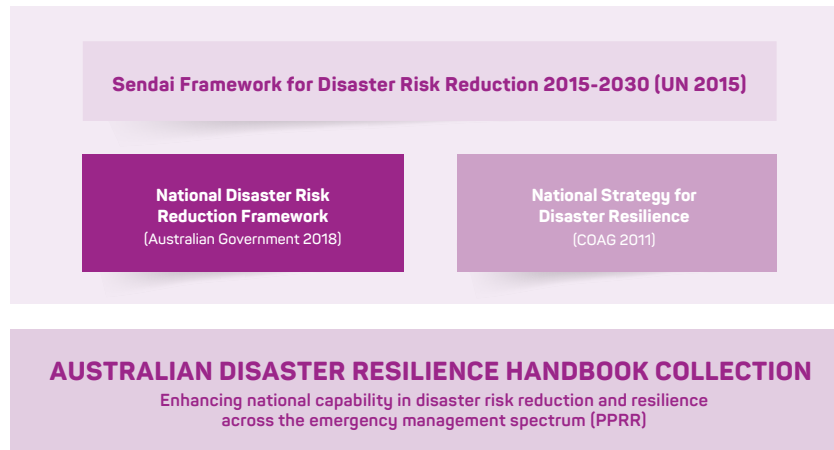


Figure1 : Australian Disaster Resilience Handbook Policy Landscape

NOTE: This diagram represents how the Australian Disaster Resilience Handbook Collection aligns with National and International strategy and policy. It does not illustrate the entire disaster risk reduction and resilience policy landscape.

Acknowledgements

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Executive Summary

'Today's context requires a different mindset than when the problems were created in the first place.'

(Mami Mizutori, Special Representative of the Secretary-General for Disaster Risk Reduction, UN)

The *Systemic Disaster Risk Handbook* presents principles for systemic disaster risk reduction, inclusive governance and decision-making to support resilience and sustainability. It is for leaders in government, business and communities who are affected by disaster risk and extends beyond those traditionally responsible for emergency management.

Current approaches to disaster risk reduction are being challenged in a world of more frequent and compounding hazards. As the population and economy continue to grow, increasing exposure is creating complex interdependencies that are leading to more systemic vulnerabilities. This handbook goes beyond hazard-by-hazard approaches to assessing risk. It guides leaders and decision makers from all sectors to adopt a mindset focused on systemic risks, to know why that is important to disaster risk reduction and resilience, and how to apply that thinking to their work. It has been developed to promote and guide consideration of systemic risk and resilience analysis as part of any decision, review, update or development of contemporary practical instruction or risk assessment processes.

This handbook is a core component of Australia's national disaster risk reduction and resilience guidance available on the Australian Disaster Resilience Knowledge Hub: www.knowledge.aidr.org.au

Systemic risks emerge from the interactions of climate change and natural hazards, with the complex, interdependent and interconnected networks of social, technical, environmental, and economic systems. These risks are not necessarily obvious using traditional hazard-by-hazard risk assessments and revealing them requires an understanding of the degree of magnitude of failure across these systems that could suddenly or gradually exceed society's capacity to cope¹.

'Ultimately, the behaviour of these networks determines exposure and vulnerability at all scales' (United Nations Global Assessment Report 2019).

Supporting the implementation of the *National Disaster Risk Reduction Framework* (Australian Government 2018) and the United Nations *Sendai Framework for Disaster Risk Reduction* (UNDRR 2015), this handbook draws on contemporary international and national research. It includes the following foundational concepts:

- Disaster and emergency risk management is evolving to include systemic disaster risk and resilience to inform broader risk reduction efforts.
- Whole-of-society involvement in managing risk is vital to resilience and reducing loss and harm caused by disasters.
- Inclusive governance and risk cultures framed around place-based, systemic resilience and sustainable outcomes is key.
- People and communities need tools, ability, and knowledge beyond traditional emergency management to resist, absorb, accommodate, recover, transform, and thrive in response to the effects of shocks and stresses.

¹ This statement is adapted from the *United Nations 2019 Global Assessment Report on Disaster Risk Reduction* and *Australian Government Strategic Guidance on Climate and Disaster risks: 01 Introduction*.

Principles

The *Systemic Disaster Risk Handbook* is high-level, principles-led, and fosters a disaster risk mindset to guide the evolution of good practice and innovative thought leadership. Relevant to all sectors, the principles are derived from publications, policies, and scientific literature and shaped by the substantial expertise and experience of members of the Handbook Working Group. They cover a range of concepts, some new and complex, which may take a deeper reading or broader discussion to fully understand, others may be more familiar and included for emphasis.

1	Embrace uncertainty The changing risk context involves greater uncertainty and challenges to goals and objectives. Recognise there will be many different perspectives to be negotiated. Use inclusive governance and systems thinking to help. Do not be overwhelmed or wait for certainty before taking action.
2	Think globally, act locally Thinking globally while acting locally is a must in a growing, interconnected world. Alignment and cohesion of efforts is at the core. Acting locally is best exercised by well informed and inclusive communities. Community expertise, engagement and trust is critical to reducing disaster risks and building resilience.
3	Place-based, systemic resilience and sustainable outcomes Treat resilience as capacity building and take a community-level, place-based approach to understand the points where risk is realised, the things of value that are affected and who bears the costs. Use systems thinking to get an understanding of the dynamic, complex moving parts that make up a resilient society. Look for the points of intersection and weigh up if it is values, rules, or knowledge ² that enable or constrain progress and act accordingly.
4	Establish long-term sustainability goals Plan to avoid systemic failure and invest in mitigation when setting long-term sustainability goals. Inclusive governance , and investment is key to not only long-term sustainability but short-term, incremental interventions. Consider policy, domains, climate change and systemic disaster resilience as interconnected.

2 Bureau of Meteorology, State of the Climate 2020

5	<p>Reposition current and emerging leadership</p> <p>New leadership qualities are needed to meet the challenges of the future. Disasters have shown leadership can emerge unexpectedly, in traditional and non-traditional settings, motivated by passion, hope and a sense of agency. Be equipped with trusted, contemporary knowledge and be prepared to engage and educate others about systemic risk and vulnerability. Help others up-skill and be involved in the system.</p>
6	<p>Fit governance to the characteristics of the decision context</p> <p>Structures, rules, and arrangements influence whose views and priorities are considered. As the magnitude of change becomes increasingly uncertain, it is important that diverse and broad stakeholder values and knowledge are incorporated in decisions made.</p>
7	<p>Foster networked systemic risk cultures as a powerful, enabling force</p> <p>Change is happening too quickly for slow moving strategies to be effective and more frequent considerations of risk are necessary. Treat inclusive, networked risk cultures as an enabler of opportunity and invest in developing cultures attuned to the changed systemic risk context.</p>
8	<p>Provide access to and be transparent about decisions</p> <p>Ensure that diverse stakeholders have access to the decision-making process in some form. Move from transactional or competitive relationships and invest in collaboration for collective impact.</p>
9	<p>Treat decision-making as an active learning process</p> <p>Change the nature of decision-making, including the processes used. Regard decision-making as a trial, experiment, or interim measure – actively learning from doing. Act early, regularly assess and adapt continuously.</p>

10	<p>Re-evaluate purpose and priorities</p> <p>Evolve disaster risk management to include systemic disaster risk reduction and resilience. Focus on people, place, and values and be clear on purpose and objectives. Align these with local, place-based accountable decisions and longer-term time horizons.</p>
11	<p>Take a systems approach</p> <p>Use a systems approach to illuminate complex interconnections and relationships. With this understanding it is possible to select the best intervention points for action.</p>
12	<p>Recognise values, vulnerability, and social justice</p> <p>Change purpose and objectives when values change. Be transparent about why particular decisions were chosen over others and work with stakeholders to agree on the goals and objectives for reducing disaster risk.</p>
13	<p>Provide equitable access to risk knowledge</p> <p>Regularly talk about the progress of a disaster risk reduction and resilience activity. It fosters trust and participation, allowing risk owners the opportunity to accept, treat or transfer the risk. Engage and support people to understand and use risk information to more effect and avoid an imbalance of knowledge and power.</p>

Introduction

'Resilience starts from the belief that humans and nature are strongly coupled to the point that they should be conceived as one social-ecological system. This means that in our globalised society, there are virtually no ecosystems that are not shaped by people and no people without the need for ecosystems and the services they provide.'

(Stockholm Resilience Centre 2019)

The *Systemic Disaster Risk Handbook* includes principles for systemic disaster risk reduction, inclusive governance, and decision-making to build resilience and sustainability.

The Handbook supports the implementation of the *National Disaster Risk Reduction Framework* (NDRRF) (Australian Government 2018), and the *United Nations Sendai Framework for Disaster Risk Reduction* (Sendai Framework) (UNDRR 2015).

Relevant to all sectors, this handbook is a core component of the Australian Disaster Resilience Handbook Collection to help align efforts to enable sustainable economic, social, environmental and governance outcomes.

As a capstone publication, this handbook focuses on high level principles. It does not prescribe actions or processes to use, rather it signposts existing methods and tools that could be useful depending on circumstances. Recognising there will be inconsistencies and tensions between the proposed principles and some existing practice, the Handbook should be read in conjunction with:

- *Community Engagement for Disaster Resilience* (AIDR 2020)
- *Community Recovery* (AIDR 2018)
- *Land Use Planning for Disaster Resilient Communities* (AIDR 2020)
- *Emergency Planning* (AIDR 2020)
- *National Emergency Risk Assessment Guidelines* (AIDR 2020)

Foundational to this handbook are the following concepts:

- Disaster and emergency management is evolving to include systemic disaster risk and resilience assessments to inform broader risk reduction efforts.
- Whole-of-society involvement in managing risk is vital to resilience and reducing loss and harm caused by disasters.
- Inclusive governance and risk cultures framed around place-based, systemic resilience and sustainable outcomes is key.
- People and communities need to be equipped with tools, ability and knowledge that extend beyond traditional emergency management to resist, absorb, accommodate, recover, transform, and thrive in response to the effects of shocks and stresses.

This handbook explains an initial suite of principles essential to learn, understand and apply. These have been selected from a rapidly evolving and expanding body of knowledge and shaped by the substantial expertise and experience of the members of the Handbook Working Group. A broad range of subjects are covered, some are complex and may take a deeper reading or broader discussion to fully understand, others may be more familiar and are included for emphasis. These principles are represented in Figure 2: Systemic Disaster Risk Principles.

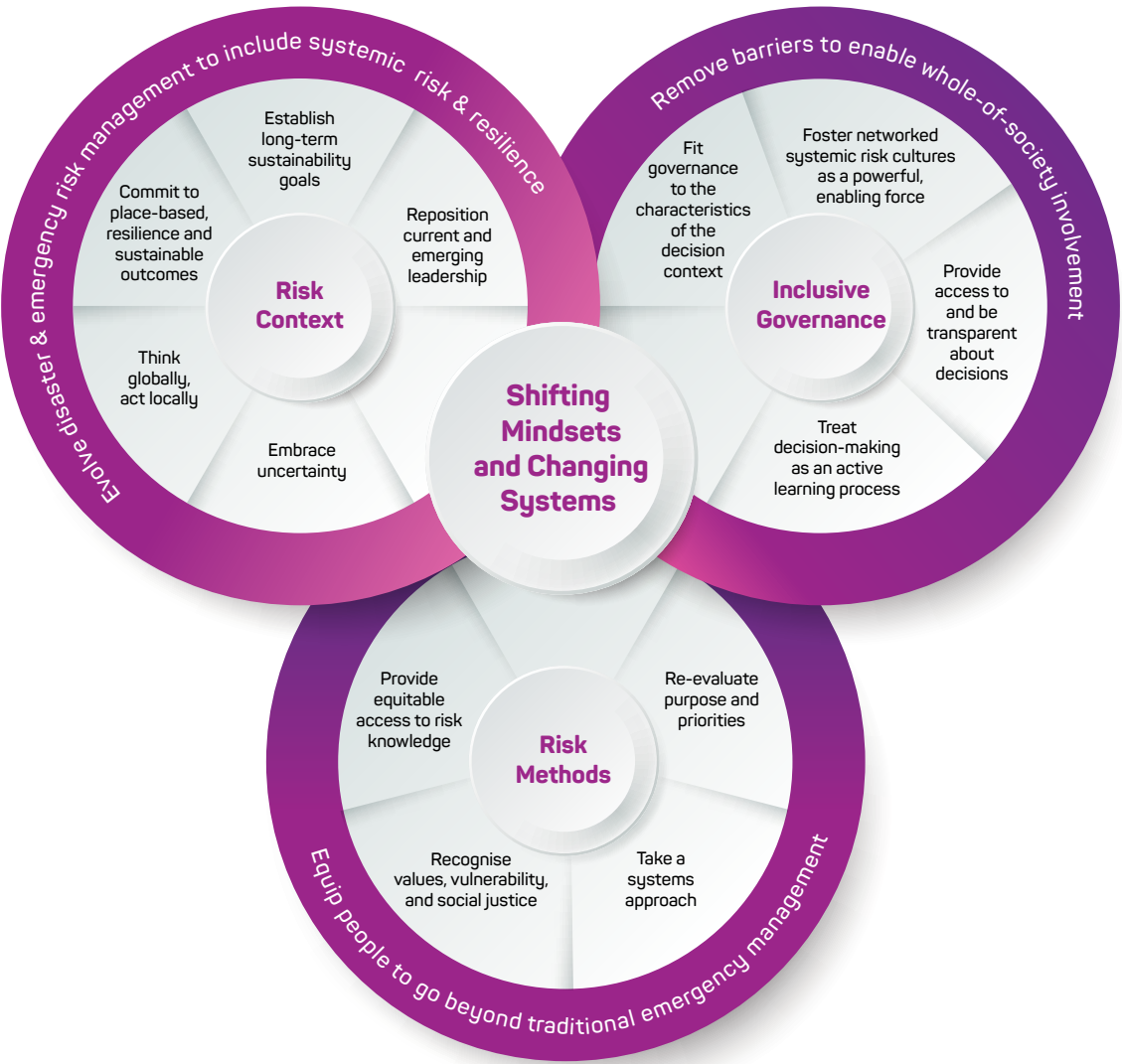


Figure 2: Systemic Disaster Risk Principles

Who is the handbook for?

Primarily, the handbook is a resource for leaders and decision makers, and those who influence decisions. This can be interpreted broadly, and decision makers can include:

- **Policymakers** – at all levels of government, involved in regulating and administering the rules and arrangements of where to place people, assets, and infrastructure on the Australian landscape and how to support and enable recovery, disaster risk reduction and resilience.
- **Technical experts** – from a wide range of specialisations (infrastructure planning, asset owners and operators, sustainable community development, climate change, public health, engineering, social protection, emergency management) involved in providing risk advice and information for use in investment decisions.
- **The business sector** – with an interest in sustaining the economic resilience of communities and prioritising investment to reduce systemic risk.
- **Communities** – with cultural and diverse lived experiences and a growing appetite to be involved; they are at the forefront of the impacts of decisions made that create risk in the first place.
- **Arts, culture and civil society** – promoting diversity and inclusion of those who are looking to contribute in meaningful ways.
- **Thought leaders and academics** – centres of research and knowledge providing an evidence-base and expertise for climate and systemic disaster risk management.

This handbook also has relevance to those who have in depth expertise and those who may be approaching systemic disaster risk for the first time. It is also relevant to communities, whose trust and involvement are pivotal to understanding disaster risk and getting to the source of what causes disaster.

Figure 3 shows how the Principles align with the *International Risk Standard ISO 31000:2018*, the *Global Risk Assessment Framework* (UNDRR 2020) and the *National Emergency Risk Assessment Guidelines* (NERAG) (AIDR 2020)

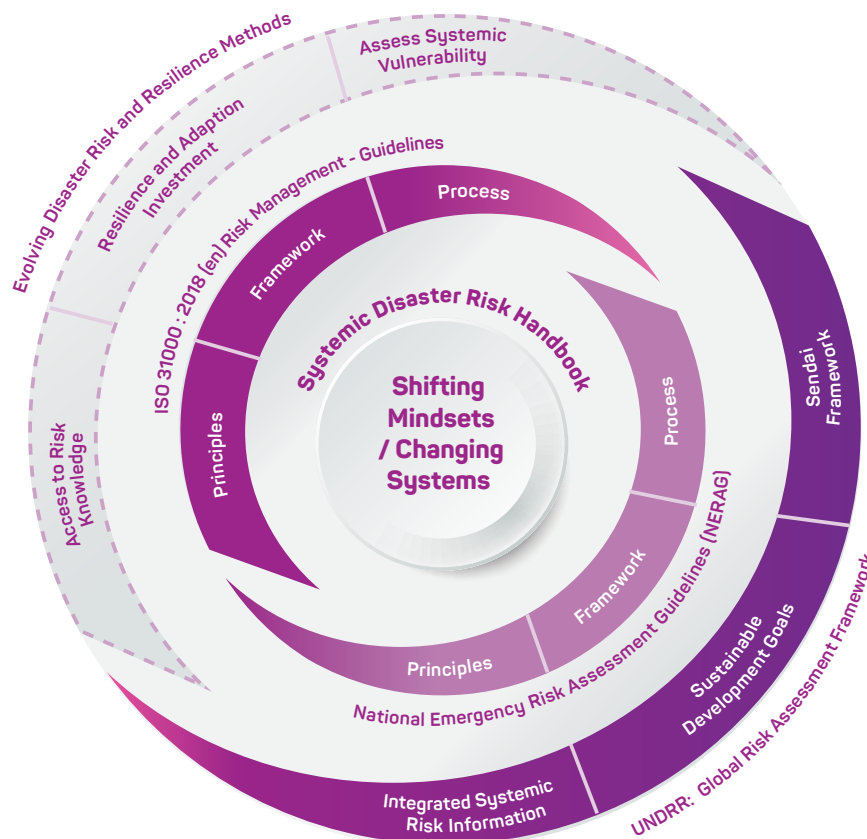


Figure 3: Evolving risk management standards, guidelines and methods

Guiding principles

'National frameworks and strategies generally establish sensible principles. It has, however, been difficult for us to determine the extent to which these principles have been, or will be, translated into tangible outcomes.'
(Royal Commission into National Natural Disaster Arrangements 2020)

The *Systemic Disaster Risk* handbook is high-level and principles-led. It fosters a disaster risk mindset to guide the evolution of good practice and innovative thought leadership to turn actions into outcomes.

Principles-led means seeing beyond rules and laws that often provide necessary societal boundaries, to translating values, behaviours, and actions into tangible outcomes that influence good, purposeful decisions.

The principles in this handbook build on those established for the *National Disaster Risk Reduction Framework* (NDRRF) (Figure 4).

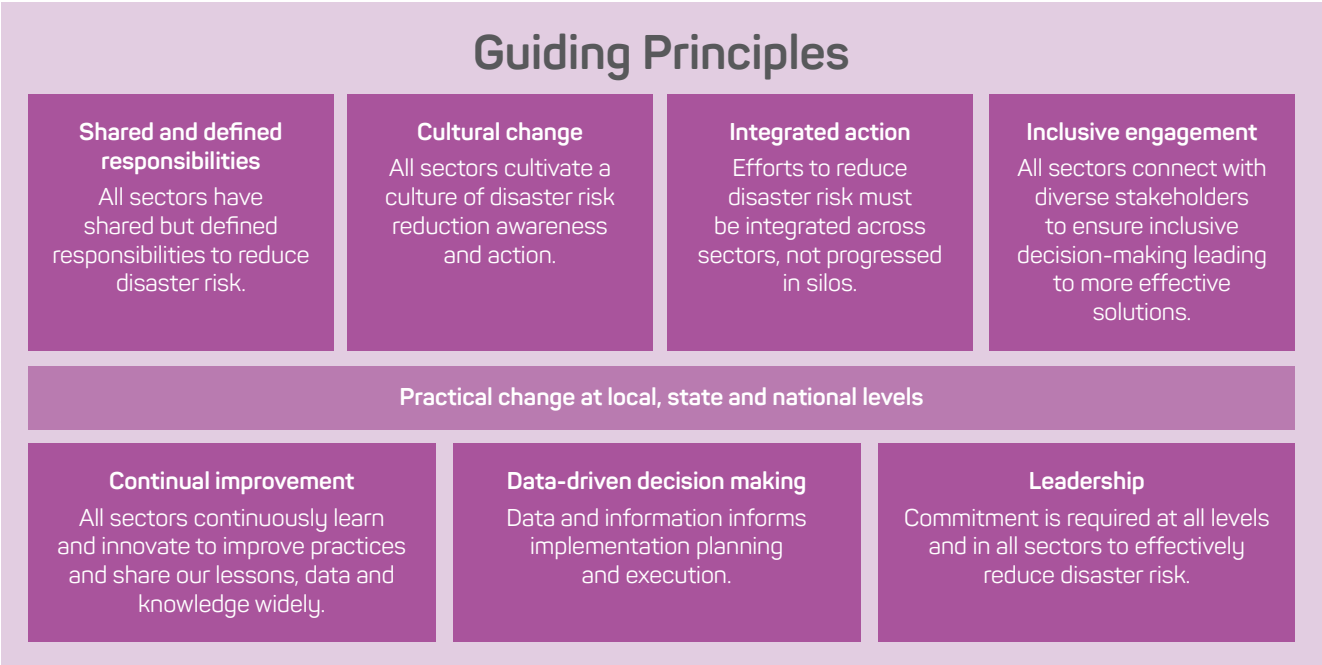


Figure 4: National Disaster Risk Reduction Framework – Guiding Principles (Australian Government 2018)

Use of this handbook

This handbook covers complex subject matter at a high level, which may trigger a need for deeper review or discussion. To help with this, additional resources (summarised in Section 6) and thought prompters are signposted throughout.

Each chapter in the handbook follows the logic of:

- What is it about?
- Why is it important?
- What are the principles and what do they mean in practice?
- Where to go for more information.

To demonstrate how the principles can be applied in practice, a series of case studies is presented in a companion document: *Systemic Disaster Risk: case study profiles*. These have been developed from interviews with:

- Scenic Rim Council – Council Mayor
- Australian Buildings Code Board – CEO
- Suncorp Group – CEO, Insurance Product and Portfolio
- Resilient Sydney – Chief Resilience Officer
- Adelaide Hills Council – Director, Strategy and Development
- Queensland Reconstruction Authority – CEO
- Tasmania Disaster Risk Assessment – Project Manager and key stakeholders.

These case studies provide real life examples and insights into the decision-making challenges of today's risk context, embracing active learning opportunities and paying forward the knowledge and expertise gained over many years.

Access the companion document, *Systemic Disaster Risk: case study profiles* here: knowledge.aidr.org.au/resources/handbook-disaster-risk

Build disaster risk literacy

Systemic disaster risk is complex and comprises evolving and complicated scientific concepts and ideas. New language and terms regularly appear and without context can cause confusion, become over-used, or turn into jargon. By its nature, systemic risk crosses many professional disciplines, each with their own interpretation and use of concepts and terms. 'Resilience', for example, means different things to different disciplines and communities of practice, i.e., community resilience, infrastructure resilience, economic resilience.

Notwithstanding this, it is necessary to build a level of disaster risk literacy, speak the language of systemic risk, and learn from the insights and expertise of multiple areas.

The Australian Disaster Resilience Glossary knowledge.aidr.org.au/glossary provides the official source of key terms used in this handbook.

These should be read in conjunction with the Australian Government's *Climate and disaster risks: Terms and Concepts* knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance and the *National Disaster Risk Reduction Framework*: knowledge.aidr.org.au/collections/disaster-risk-reduction



1. Change the risk context

'There are places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything.'

(Donella Meadows 1999)

'The era of hazard-by-hazard risk reduction is over'. This is a key message from the United Nations Office for Disaster Risk Reduction (UNDRR) echoing across the world.

We are now in an era of risk and resilience analysis that deals with systemic risk reduction, greater uncertainty, and more complexity.

Systemic risks emerge from the interactions of climate change and natural hazards, with the complex, interdependent and interconnected networks of social, technical, environmental, and economic systems. These risks are not necessarily obvious using traditional hazard-by-hazard risk assessments and revealing them requires an understanding of the degree of magnitude of failure across these systems that could suddenly or gradually exceed society's capacity to cope³.

'Ultimately, the behaviour of these networks determines exposure and vulnerability at all scales' (United Nations Global Assessment Report 2019).

In recent years, all Australians (and the world) have experienced what systemic risk looks like through the massive disruption and harm triggered by several disastrous events, for example:

- 2019–20 bushfires in Australia
- COVID-19 global pandemic and associated lockdowns
- 2021 widespread flooding and severe weather damage across Australia.

People died, communities and economies were devastated, essential services, infrastructure, and supply chains were severely disrupted or overwhelmed. Climate change projections indicate that many natural hazards will intensify as the climate warms, with devastating effects as more people, the environment and the economy become exposed and vulnerable to their impacts (BOM 2020).

It is now harder to anticipate where and how disasters will strike, with efforts across all sectors accelerating to better understand their risks, be resilient to impacts and mitigate the potential for harm. This means drawing on, adapting, or creating risk tools and methods, calibrated to the reality of increasing uncertainty and with a sense of urgency to work together. To do this, risk assessment needs to evolve beyond current approaches and institutional structures; disasters are not natural and should no longer be considered only an emergency management issue.

'...to say a disaster is natural is wrong. What's worse, it misleads people to think the devastating results are inevitable, out of our control and are simply part of a natural process.' (#nonaturaldisaster)

(UNDRR)

Continually dealing with disasters is an iterative and adaptive process and a global challenge. It highlights the need to build capacity and capability to integrate systemic risk and resilience assessments into existing risk management frameworks. A great deal has been done already, but there is more to do.

³ This statement is adapted from the United Nations 2019 Global Assessment Report on Disaster Risk Reduction and Australian Government Strategic Guidance on Climate and Disaster risks: 01 Introduction.

The principles in this chapter encourage action in the face of great uncertainty, alignment of thinking, building place-based resilience capacity and re-positioning current and emerging leadership to meet the challenges of the future.

1	<p>Embrace uncertainty</p> <p>The changing risk context involves greater uncertainty and challenges to goals and objectives. Recognise there will be many different perspectives to be negotiated. Use inclusive governance and systems thinking to help. Do not be overwhelmed or wait for certainty before taking action.</p>
2	<p>Think globally, act locally</p> <p>Thinking globally while acting locally is a must in a growing, interconnected world. Alignment and cohesion of efforts is at the core. Acting locally is best exercised by well informed and inclusive communities. Community expertise, engagement and trust is critical to reducing disaster risks and building resilience.</p>
3	<p>Place-based, systemic resilience and sustainable outcomes</p> <p>Treat resilience as capacity building and take a community-level, place-based approach to understand the points where risk is realised, the things of value that are affected and who bears the costs . Use systems thinking to get an understanding of the dynamic, complex moving parts that make up a resilient society. Look for the points of intersection and weigh up if it is values, rules, or knowledge⁴ that enable or constrain progress and act accordingly.</p>
4	<p>Establish long-term sustainability goals</p> <p>Plan to avoid systemic failure and invest in mitigation when setting long-term sustainability goals. Inclusive governance, and investment is key to not only long-term sustainability but short-term, incremental interventions. Consider policy domains, climate change and systemic disaster resilience as interconnected.</p>
5	<p>Reposition current and emerging leadership</p> <p>New leadership qualities are needed to meet the challenges of the future. Disasters have shown leadership can emerge unexpectedly, in traditional and non-traditional settings, motivated by passion, hope and a sense of agency. Be equipped with trusted, contemporary knowledge and be prepared to engage and educate others about systemic risk and vulnerability. Help others up-skill and be involved in the system.</p>

4 Bureau of Meteorology, State of the Climate 2020

To learn more:

Government of South Australia 2019, *Stronger Together – South Australia's Disaster Resilience Strategy* www.safecom.sa.gov.au/initiatives/stronger-together-south-australias-disaster-resilience-strategy

Infrastructure Australia 2021, *Sustainability Principles: Infrastructure Australia's approach to sustainability*: www.infrastructureaustralia.gov.au/sites/default/files/2021-04/IA%20Sustainability%20Principles_final_2.pdf

NSW Government 2020, *Climate Risk Ready NSW*, climatechange.environment.nsw.gov.au/adapting-to-climate-change/climate-risk-ready-nsw

Queensland Government 2017, *Queensland Strategy for Disaster Resilience*: www.qra.qld.gov.au/qsdr

Queensland Reconstruction Authority 2019, *Queensland Disaster Resilience and Mitigation Investment Framework*: www.qra.qld.gov.au/sites/default/files/2019-01/queensland_disaster_resilience_mitigation_framework_-_february_2019.pdf

Resilient Sydney 2021, *Resilience Hazard Assessment Guide*: www.cityofsydney.nsw.gov.au/governance-decision-making/resilient-sydney

1.1 Embrace uncertainty

Risk is the effect of uncertainty on objectives. The process for managing risk is embedded in the International Standard ISO 31000:2018 *Risk management – guidelines* and NERAG (AIDR 2020). While disaster risk has its own definition, systemic disaster risk relates to the potential impacts that arise from exposure of vulnerable people, communities, assets, natural environments and socio-economic activities and services (Australian Government 2019).

Uncertainty challenges the imagination, while also demanding the use of imagination. It is inherently easier to recall something that happened in the past, than to imagine something in the future. This makes reacting to the past easier, as opposed to being proactive for the future.

The disruption and harm caused by events such as a global pandemic, major bushfires, severe weather events (such as storms and heatwaves), economic collapse or civil unrest, can be epic. It is important to remember the likelihood of something happening does not diminish the effects when it does, and it is getting harder to predict and forecast future risk and impacts.

It is also important to recognise the cumulative and chronic effects of more frequent disasters, particularly for those who are caught up in the now seemingly endless cycle of response and recovery. This creates a significant barrier to being able to take a strategic and objective view of what is required to reduce disaster risks and achieve resilience, with substantial untold and largely unquantifiable costs to individuals' psychological and physical wellbeing and levels of community trust in decision makers and institutions.

In the context of systemic disaster risk reduction, it is important to embrace uncertainty, but not be overwhelmed by it or wait before deciding to act. Reducing systemic disaster risks and building resilience involves making timely decisions based on having good information about what could happen to who or what, when and where, and an understanding of the resilience capacity of communities, institutions, and systems.

To apply this principle:

Do not let the complexities of uncertainty stop you from exploring novel climate change and disaster scenarios. Use inclusive governance and techniques such as forecasting or scenario planning to help people imagine what they have never seen and work through these uncertainties.

Think about...

What can I do to influence change?

Consider your frame of reference or context. Boost your understanding of disaster risk reduction and the impact of climate change. Even if you do not know all the potential futures, incorporate this into your thinking and accept the situation could be both unchangeable and an opportunity.

Ask yourself:

- What is disaster risk reduction?
- What is climate change?
- What are the impacts of disasters on myself, my community, my place, the country and globally?
- What things are there no answers for?
- How can we leverage those knowledge gaps?

Reflect on your own core values and key principles. How do they differ from others? These core values will guide you in decision-making and affect your appetite for risk and ambiguity. The same values will guide your decisions on the types of loss you would tolerate.

Ask yourself:

- Why do I want to take action to mitigate or otherwise reduce disasters?
- How prepared am I to make decisions before and during a disaster and face the consequences of these decisions?
- What information is my priority to learn before and/or during a disaster?
- What do I want and need to protect most and what am I most willing to risk?

Be clear on the outcomes you want to achieve. How would you encourage everyone to work towards resilience and reduce risk and disasters?

1.2 Think globally, act locally

'In a sense being part of the community sector is always about seeing the big picture, and often acting very locally'.

(Robert Fitzgerald AM)

When confronted with compounding and challenging disasters thinking globally while acting locally is a must, however with this comes greater complexity. For example, at what scale should climate and disaster risks be managed when risks are created and realised at a regional scale but are acutely felt at community, place-based levels?

Facilitated by the UNDRR, global and national frameworks encourage a broadening of the focus from managing emergencies to managing disaster risks; from thinking about hazards, to thinking about interdependent systems. It takes time to affect this change and alignment, and cohesion of effort is an effective way to approach this challenge.

The frameworks, combined with other global initiatives like the Task Force for Climate-Related Financial Disclosures, are having a ripple effect across all sectors of Australian society and incentivising action beyond what traditional rules have required. Acting with a sense of urgency, new collective impact initiatives have sprung into action, capturing the goodwill and passion of Australians to do more. Spanning short to long-term timeframes, many of these initiatives have industry backing and resources, with levels of collaboration and cooperation not seen before.

For example: the *Australian Sustainable Finance Initiative Roadmap*, Australian Business Roundtable for Disaster Resilience & Safer Communities-led Resilience Valuation Initiative, Minderoo Foundation *Flood & Fire Resilience* and the Australian Red Cross Drought Resilience Program.

All sectors, including philanthropy, community service and not for profit are becoming increasingly involved, adapting and expanding their capacity to contribute and invest in inclusive governance.

At the core of these initiatives is funding and investment driven by an understanding of the need to do things together and differently, not simply better, to enhance the resilience, wellbeing and prosperity of the nation.

Risk is part of the collective human experience. As the potential for hazards such as bushfire, floods, droughts and heatwave increase, new risks (such as multiple disasters during a pandemic) will emerge in

ways not anticipated and once thought inconceivable. International institutions recognise the need to reflect the systemic nature of risk and how we deal with it. The UNDRR guidance materials support individuals and organisations to collectively learn and adapt (see learn more box for details).

To apply this principle:

Acting locally is best exercised by well informed and included communities. Acknowledge community expertise and support meaningful engagement. Trust is critical to reducing disaster risks, building resilience and everything in between (including planning and responding)⁵.

To learn more:

Australian Business Roundtable for Disaster Resilience and Safer Communities Resilience Valuation Initiative: australianbusinessroundtable.com.au/our-initiatives

Australian Red Cross Drought Resilience Program: www.redcross.org.au/get-help/emergencies/recovering-from-emergencies/drought-resilience-program

Australian Sustainable Finance Initiative: www.sustainablefinance.org.au/roadmap-1

Collective Impact Forum: www.collectiveimpactforum.org/what-collective-impact

Creative Recovery Network: creativerecovery.net.au

Minderoo Foundation, Fire & Flood Resilience: www.minderoo.org/fire-and-flood-resilience

Robert Fitzgerald AM, Reimagining the community sector: www.youtube.com/watch?v=PJZOiwOIVw4

Task Force for Climate-Related Financial Disclosures: www.fsb-tcfd.org

UNDRR, *Global Assessment Report on Disaster Risk Reduction*: www.undrr.org/publication/global-assessment-report-disaster-risk-reduction-2019

UNDRR, *Words into Action Guidelines*: www.undrr.org/words-action

UN Sustainable Development Goals: sdgs.un.org/goals

1.3 Commit to place-based, systemic resilience and sustainable outcomes

'To increase resilience a deep understanding of the conditions of vulnerability is required: understanding that contributes to the shaping of risk governance.'

(Marc Gordon 2020)

Treat resilience as capacity building and take a community-level, place-based approach to understand where risk is realised, the things of value that are affected and who bears the cost. To do this, cultivate systemic disaster risk thinking and practices, and focus on good collaborative risk governance.

Recent experiences have shown current approaches that focus only on emergency risk assessments are limiting and new forms are emerging. For example, Resilient Sydney, led by government, pioneered the concept of a resilience hazard assessment⁶ that takes 'a holistic perspective of shocks and stresses to support planning and preparedness' within a specific place or community. This builds on the results of metropolitan scale Resilient Sydney resilience assessment as supported by the global 100 Resilient Cities initiative.

Another example, Regen Melbourne⁷, is an extensive community-led network of individuals and organisations exploring a post-COVID regenerative future for the City of Melbourne. Embracing Doughnut Economics⁸, which explores ways of thinking to thrive in the 21st century, the network has created a vision for a renewed Melbourne and an innovative compass to guide their work.

5 Australian Institute for Disaster Resilience 2020, *Community Engagement for Disaster Resilience*, knowledge.aidr.org.au/resources/handbook-community-engagement

6 Resilient Sydney 2021, *Resilience Hazard Assessment Guide* www.resilientsydney.com.au

7 Regen Melbourne 2021, *Towards a Regenerative Melbourne*, www.regen.melbourne

8 Raworth K 2017, *Doughnut Economics: 7 Ways to Think Like a 21st Century Economist*

To apply this principle:

Commit to place-based, systemic resilience outcomes and use systems thinking to understand the dynamic, complex moving parts that make up a resilient society. Understand that disruptive shocks from any source magnify underlying community stresses and vulnerabilities across hyper-dependent systems, and essential community lifelines, where there is low tolerance for loss and disruption (safety, power, food, water, health, fuel). Look for the points of intersection and leverage where values, rules, and knowledge enable or constrain progress and action accordingly.

Current and more importantly future disaster events will require greater resources, diverse groups working together and a valid model of shared responsibility. Apply social capital to strengthen and embed resilience, as individuals, communities, and businesses with more social ties have a greater sense of place and belonging and as such are more prepared and resilient.

Pursue long-term resilience through better decision-making guided by new forms of inclusive governance, education, and investment. Use place-based planning as a tool for scenario building and testing; it is a central building block to establishing the right governance to enable a systems approach to work.

To learn more:

Aldrich, D 2017, *The Importance of Social Capital in Building Community Resilience in Rethinking Resilience, Adaptation and Transformation in a Time of Change*, DOI 10.1007/978-3-319-50171-0_23

Australian Business Roundtable 2017), *Building Resilience to Natural Disasters in Our States and Territories*, australianbusinessroundtable.com.au/assets/documents/ABR_building-resilience-in-our-states-and-territories.pdf

Australian Government Department of Home Affairs 2018, *Profiling Australia's Vulnerability: The interconnected causes and cascading effects of systemic disaster risk*, knowledge.aidr.org.au/resources/profiling-australias-vulnerability/

Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making*. Strategic Guidance: 02 Guidance on Governance, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

CSIRO and Value Advisory Partners (2021), *Enabling Resilience Investment*, enablingresilienceinvestment.com

CSIRO Values Rules Knowledge Framework, research.csiro.au/dsp/values-rules-knowledge-vrk-framework

Goodman, M, *The Systems Thinker*, Systems thinking: what, why, when, where and how? thesystemsthinker.com/systems-thinking-what-why-when-where-and-how

Jones, R N, Young, C K and Symons, J 2017, *Mapping Values at Risk from Natural Hazards at Geographic and Institutional Scales: Framework Development*, www.bnhcrc.com.au/publications/biblio/bnh-3860

Sphere Association 2018, *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response*, fourth edition, Geneva, Switzerland, www.spherestandards.org/handbook

United Nations Office for Disaster Risk Reduction and Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector 2017, *Comprehensive School Safety: A global framework in support of The Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector and The Worldwide Initiative for Safe Schools*, www.undrr.org/publication/comprehensive-school-safety

1.4 Establish long-term sustainability goals

When objectives evolve slowly, sentiment, lived experience, information, and decision-making processes can keep up with marginal changes. However, as seen with COVID-19, current changes are readily outstripping the pace of orderly evolution of objectives and decision-making processes (Collof et al 2018).

Climate-driven hazards like storms, floods, and drought affect more people in the Asia-Pacific than in the rest of the world combined and continue to deviate from their usual characteristics and tracks. According to the *Asia-Pacific Disaster Report 2019* it is now more difficult to determine which areas should prepare for what kind of disaster (UNESCAP 2019).

Australia has committed to the United Nations 2030 Development Agenda for Sustainable Development. This agenda promotes seventeen goals that apply equally to Australians as they do internationally. Inspired by this global effort, the response by a growing number of Australians is extensive, with many projects directly contributing to the achievement of these goals. For example, the Australian Indigenous Economic Development Program, Bushfire Recovery for Kangaroo Island (by Junction), The Victorian Salt Reduction Partnership (the George Institute for Global Health), Transforming Housing: affordable housing for all (Melbourne School of Design).

This handbook is also a contribution to the achievement of the goals.

As the climate continues to warm, Australia along with other countries, will be subject to pressure from growing uncertainty and repeated shocks from disaster. As seen from the experience of recent disasters, the cascading effect on society is profound and as the stresses build, tipping points may be reached. As Figure 5 depicts, finding the balance between avoiding systemic failure and investing in mitigation is a global challenge and requires a long-term timeframe in which to achieve resilience and broader sustainability goals.

To learn more:

Australian Government 2018, National Disaster Risk Reduction Framework: knowledge.aidr.org.au/collections/disaster-risk-reduction

Colloff, M J, Gorddard R, & Dunlop, M 2018, The values-rules-knowledge framework in adaptation decision-making: a primer, CSIRO Land and Water, Canberra.

CSIRO and NAB 2019, *Australian National Outlook*: www.csiro.au/en/work-with-us/services/consultancy-strategic-advice-services/csiro-futures/australian-national-outlook

Infrastructure Australia 2021, *Sustainability Principles: Infrastructure Australia's approach to sustainability*: www.infrastructureaustralia.gov.au/sites/default/files/2021-04/IA%20Sustainability%20Principles_final_2.pdf

Queensland Reconstruction Authority 2017, *Queensland Strategy for Disaster Resilience*: www.qra.qld.gov.au/qsdr

United Nations 2015, *2030 Agenda for Sustainable Development*, www.un.org/sustainabledevelopment/development-agenda

1.5 Reposition current and emerging leadership

'With the increasing likelihood of having to experience events that exceed our capacity to effectively treat risk, a different type of leadership is needed.'

(Crosweller & Tschakert 2019)

A changing risk context poses an enormous challenge, not only for those in leadership positions who are asked to protect who and what is most vulnerable from extreme events (Crosweller 2021), but leaders across all sectors.

Until recent years leaders have been able to draw on their experience, established protocols and instincts for most eventualities. This outdated approach does not require leaders to reframe their understanding of the scale, nature, and construct of an unfolding disaster, but will test their capacity limits. At the heart of this leadership challenge is a 'narrow space for manoeuvring' in which disaster management and political leaders often find themselves: asked, on one hand, to anticipate and control disasters that have become increasingly

complex, ambiguous and uncertain while constrained, on the other hand, by ideologies and market-based paradigms that demand resilient citizens' (Crosweiler & Tschakert 2019).

Most leaders have broad skills and experiences and bring passion and commitment to their roles; oftentimes, however, they are not necessarily equipped with the additional leadership qualities required for today's context. Effective systemic disaster leadership needs to be viewed not only through a lens of a disaster, but through the capacity to shape and influence the development of law, policy, systems, and governance that establish the conditions for a sustainable and resilient society.

Repositioning and re-educating leaders is necessary to evolve cognitive biases to include valuing and including risk reduction, resilience, and sustainability into effective and just decision-making and investment before disasters strike. Just as important is moving away from a competitive mindset and nurturing collaboration as the primary organising method in society.

During times of disaster, leadership can emerge unexpectedly, in traditional and non-traditional settings, from different motivations and with different levels of power, wealth, resources, knowledge and capacity to act. During these times who is listened to is primarily position-based (local government official, political leader, emergency manager), however the characteristics and qualities of the leader shape the way they are viewed by individuals, communities, institutions, and governments.

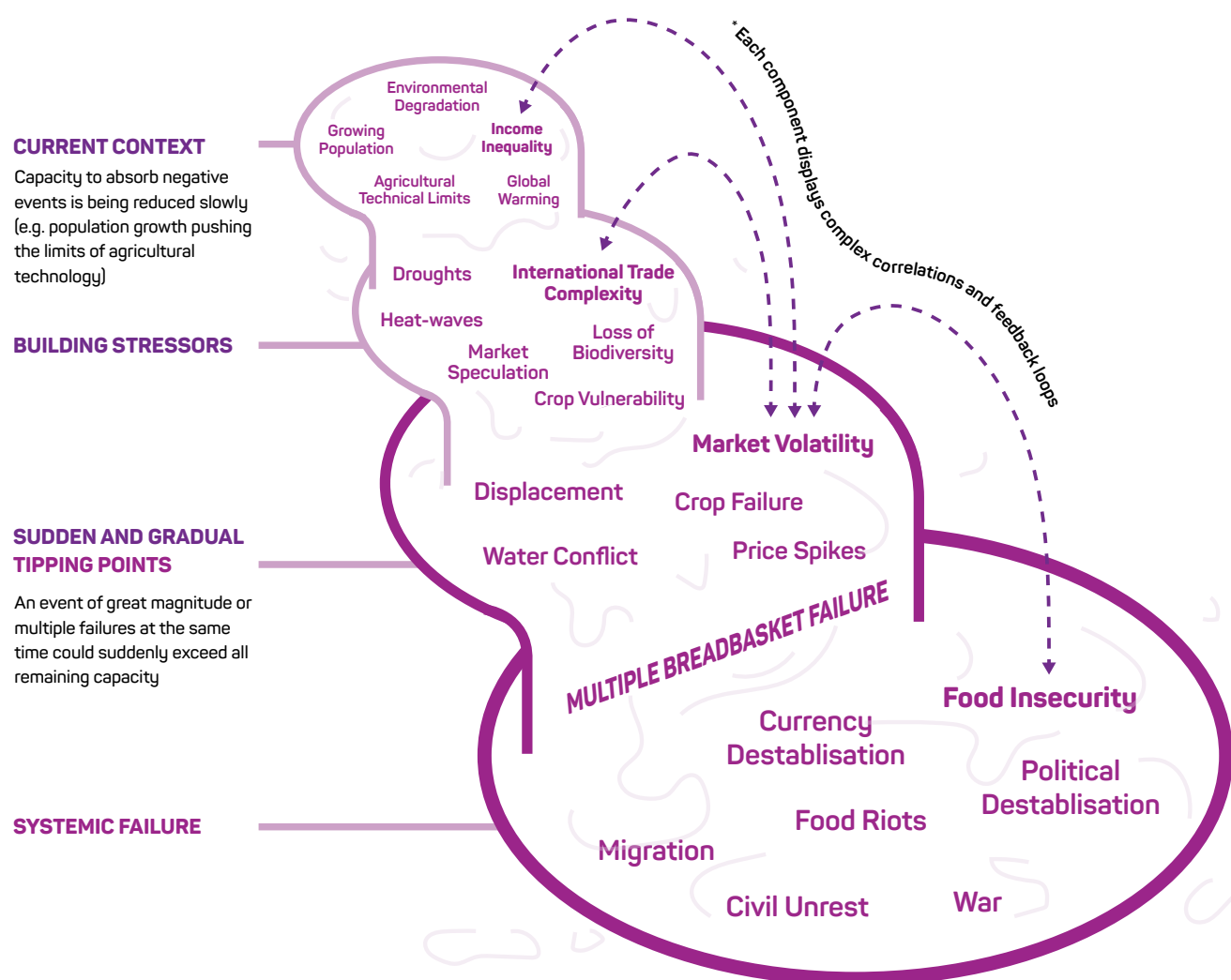


Figure 5: Multiple Breadbasket Failure: United Nations 2019 Global Assessment of Risk

According to Crosweller and Lennick, leadership qualities relevant to today's context include:

- Ethical and moral leadership: trust, compassion, and capacity to care
- Accountability and responsibility to others: authentic and relational
- Tolerant of contestation: appreciation of different values and trade-offs
- Acceptance of mutual vulnerabilities: recognition and support

To apply this principle:

As the future requires greater leadership from all sectors, reframe and nurture these qualities in current and emerging leaders so that trusted, confident, and just decisions can be made – in the middle of disasters as well as when planning the future. This requires a re-think of education, skills development, risk context and inclusive practices in engaging community and other leaders.

To learn more:

Australian Institute for Disaster Resilience 2020, *Community Engagement for Disaster Resilience*, knowledge.aidr.org.au/resources/handbook-community-engagement

Crosweller, M, Tschakert, P 2019, Climate change and disasters: the ethics of leadership, *WIREs*, vol. 11, no. 2.

Etkin, D A, Timmerman, P 2020, *The Ethical Emergency Manager: Issues, Morality and Dilemmas*

Lennick, D, Kiel, F & Jordan, K 2011, *Moral Intelligence – enhancing business performance and leadership success in turbulent times*, Pearson Professional.



2. Build inclusive governance capacity

'Accountability is a core component of effective governance, made up of four key elements – transparency, answerability, enforcement and responsiveness.'

(Royal Commission into National Natural Disaster Arrangements 2020)

The shift in risk governance to a longer timeframe off the back of compounding disasters is providing the necessary impetus and traction for change across all sectors. Now, disaster risk management is not just about the survival or recovery of a community or business. A critical factor for governance and leadership, it is about how these results can be achieved while also working towards longer-term resilience outcomes, minimising loss and harm and nurturing and regenerating the natural environment.

Governance can mean different things to different people. Here, governance is equated with the structures, rules and arrangements that provide a mandate and accountability for the functioning of systems, assets, people, and economies – whether undertaken by governments, institutions, or other entities. Inherent within these arrangements is the expectation that risks will be transparently and effectively managed, and decisions made to mitigate them are inclusive, fair, just, well-informed and can be trusted.

Climate change and disasters present fundamental, systemic risks to the national and global economy and financial systems. Recognising investors, lenders and insurers cannot price climate-related risks or opportunities completely, nor have a clear view of how public and private sector entities will cope, the Task Force on Climate-related Financial Disclosures led a global campaign promoting greater market transparency and stability to channel investment to sustainable and resilient solutions, opportunities, and business models.

These initial steps produced a movement across the world, with recommendations to provide better information to support investment progressively embedded in governance and regulatory instruments, for example, the *APRA Prudential Practice Guide* (APRA 2021). It also led to a focus on personal and organisational liability, particularly regarding duty of care and diligence, and what company directors could and should be doing on climate change.

These significant developments are important to the field of systemic climate and disaster risk management and have massive governance implications.

'The pendulum has swung on directors' duties and climate change. In 2016, our focus was the existence of the duty; that is, what directors could and should be doing on climate change to discharge their duty of due care and diligence. That is now uncontroversial. In 2019, we observed that the risk of liability for directors on this front was rising exponentially. In 2021, it appears to us that the focus is increasingly on how the duty is discharged. One aspect of this is that a company (and its directors) could be found to have engaged in misleading or deceptive conduct or other breaches of the law by not having had reasonable grounds to support the express and implied representations contained within climate change commitments. There is a reason to think that 'greenwashing' claims of the kind outlied in this memorandum will become an acute source of risk. Cases of this kind have been emerging overseas. Greenwashing could prove to be the focus of what has been called the 'third wave' of climate litigation.'

(Hutley & Hartford 2021).

The principles in this chapter promote inclusive governance, networked cultures and building capacity to respond to unprecedented change for which there are few tested solutions.

6	<p>Fit governance to the characteristics of the decision context</p> <p>Structures, rules, and arrangements influence whose views and priorities are considered. As the magnitude of change becomes increasingly uncertain, it is important that diverse and broad stakeholder values and knowledge are incorporated in decisions made.</p>
7	<p>Foster networked systemic risk cultures as a powerful, enabling force</p> <p>Change is happening too quickly for slow moving strategies to be effective and more frequent considerations of risk are necessary. Treat inclusive, networked risk cultures as an enabler of opportunity and invest in developing cultures attuned to the changed systemic risk context.</p>
8	<p>Provide access to and be transparent about decisions</p> <p>Ensure that diverse stakeholders have access to the decision-making process in some form. Move from transactional or competitive relationships and invest in collaboration for collective impact.</p>
9	<p>Treat decision-making as an active learning process</p> <p>Change the nature of decision-making, including the processes used. Regard decision-making as a trial, experiment, or interim measure – actively learning from doing. Act early, regularly assess and adapt continuously.</p>

To learn more:

APRA Prudential Practice Guide, April 2021

Centre for Policy Development, Hutley, N & Hartford Davis, S 2021, *Climate Change and Directors Duties*, cpd.org.au/wp-content/uploads/2021/04/Further-Supplementary-Opinion-2021-3.pdf

Collective Impact Forum 2014, www.collectiveimpactforum.org/what-collective-impact

Krznaric R 2021, *The Good Ancestor, How to Think Long Term in a Short-Term World*, WH Allen

Task Force on Climate-related Financial Disclosures 2021, www.fsb-tcfd.org/about

Think about...

- How do you reduce disruption to people's livelihoods in the face of more frequent and intense disasters?
- How do you prepare communities to better manage the effects on their physical and mental wellbeing, which can extend long after the hazard has passed?
- Are your governance arrangements inclusive of the full range of community members' interests, and characteristics?
- Do you know who the beneficiaries are that are impacted by your decisions (even if they are not your direct responsibility)?
- Do you have public trust and mandate for your risk decisions? Are values aligned?
- Have you included wider parts of the community and not just within your organisation in your decision-making?
- Are roles and responsibilities clear?

2.1 Fit governance to the characteristics of the decision context

'Interdependent systems of infrastructure, goods and services and ways of living are inherently reliant on interdependent risks being collectively managed.'

(Australian Government 2019, Climate and Disaster Risk: 01 Introduction)

There is an urgent need for disaster risk governance arrangements that support and enable people to better coordinate, collaborate, assess, communicate, and make adaptive decisions⁹

Climate change, along with other interacting drivers of change, is increasing levels of uncertainty of knowledge, ambivalence of goals and objectives and distribution of power amongst stakeholders. To address this there is a need to clarify roles and responsibilities for risk assessment, ownership and management.

To apply this principle:

Recognise trends and diagnose the causes and potential effects to inform the governance required to better enable decision makers.

Coordinate and steer efforts towards policies that build competencies and enable processes that suit the decision context (Figure 4), for example:

- Where there is high uncertainty of knowledge, develop governance arrangements that enable mission-directed, bottom-up processes and nurture innovation while continuing to deliver value in the short term. At the same time, those governance arrangements should create and enable environments in which many different stakeholders can learn, adapt, and negotiate where it is safe to fail, not fail safe.
- In situations of high ambivalence of goals and objectives, develop governance arrangements (policies, standards, methodologies) that require and support inclusive, participatory development and use scenarios to enable diverse groups to create climate-compatible objectives and collective impact initiatives.
- In situations of high distribution of power, with many diverse stakeholders covering different jurisdictions, explore new systems and values-based¹⁰ approaches to risk diagnosis and redistribution of responsibilities (ownership), along with governance that better enables distributed stakeholders (decision makers) (e.g., through establishing interconnected networks) with diverse values, world views and interests to communicate and negotiate more effectively (Jones et al 2017).

⁹ Kania, J, Kramer, M 2011, Collective Impact, Stanford Social Innovation Review, ssir.org/articles/entry/collective_impact# and collaborationforimpact.com

¹⁰ Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. 3 Guidance on Vulnerability*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

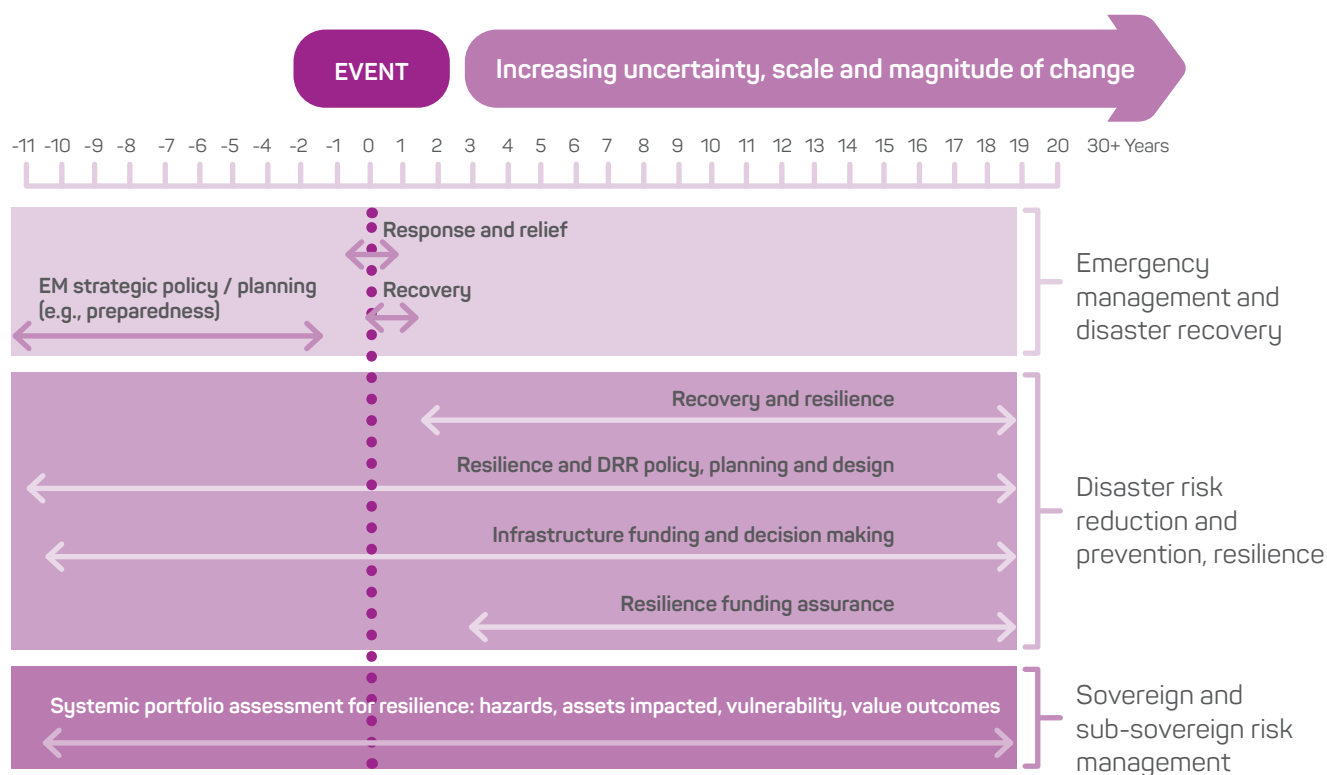


Figure 6: Enabling Resilient Investment (ERI): types of decisions and decision contexts in the disaster cycle

To learn more:

Collective Impact Forum 2014, www.collectiveimpactforum.org/what-collective-impact

Colloff, M J, Gorddard R, & Dunlop, M 2018, *The values-rules-knowledge framework in adaptation decision-making: a primer*, CSIRO Land and Water, Canberra.

Jones, R N, Young, C K and Symons, J 2017, *Mapping Values at Risk from Natural Hazards at Geographic and Institutional Scales: Framework Development*, www.bnhcrc.com.au/publications/biblio/bnh-3860

2.2 Foster networked risk cultures as a powerful, enabling force

'Culture is the complex whole which includes knowledge, belief, art, moral, law, custom and any other capabilities and habits acquired by [members] of society.'

(Edward Taylor)

Culture is at the heart of good governance and an important enabler of success. It is determined and modelled by those who lead, be it in the boardroom, in organisational management, or in government. Awareness and ongoing active management of systemic disaster risk should be part of any organisational governance and culture.

Recent disasters exposed deeply entrenched systemic vulnerabilities. They revealed the limitations of established protocols and the importance of ethics and values as fundamental to good risk governance and decision-making.

The COVID-19 pandemic illustrates this with leaders confronted with the ethical dilemma of making choices and balancing trade-offs in a rapidly evolving crisis with lives and livelihoods threatened, and economies ground to a halt. This experience has also provided insight into community tolerance for loss and mistakes.

More frequent considerations of risk are necessary, including a need to revisit objectives. Conditions are changing too quickly for slow-moving strategies to be effective and exceeding the effectiveness of existing ways of operating and design standards.

This means investing in cultures attuned to the new disaster risk context and processes that are adept and flexible; backing this up with authority and resources to mitigate risks. In this way and as the culture matures, systemic disaster risks can be anticipated, and major shocks avoided.

To apply this principle:

Establish incentives, provide resources, and encourage leaders to build a strong disaster risk culture. Think of inclusive, networked disaster risk cultures as enablers of opportunity rather than a barrier or added cost burden.

A strong risk culture is well governed, promoting ethical and mutually beneficial collaboration, with clear, accountable roles and responsibilities.

To learn more:

Kulatunga, U 2010, Impact of Culture towards Disaster Risk Reduction, *International Journal of Strategic Property Management*, vol. 14, pp 304-313.

2.3 Provide access to and be transparent about decisions

'Inclusive risk governance assumes that all stakeholders have something to contribute to the process of risk governance.'

(Global Assessment of Risk Report 2019)

A major learning from recent experiences is the need for stronger collaboration and sharing of knowledge. This is important as the country needs to move from transactional or competitive interactions to coordinated or collaborative relationships (CSIRO 2020).

Disaster risk reduction happens at all levels of government and throughout society. However, no sector on its own has the mandate, authority, legitimacy, or resources to fully address the deeper socio-economic, cultural, regulatory, or political forces that put people at risk in the first place (Australian Government 2018). Additionally, many decision makers can be constrained by their positions and jurisdictions, for example, a local council debating a sea wall must work within legislation set by state governments.

An effective risk reduction process in an organisation, sector or region should not be conducted in isolation. It requires engagement with and consideration of internal and external stakeholders and drivers of risk, using collaborative processes. Disaster risk reduction requires procedural fairness to ensure all those affected by a decision (in both negative and positive ways) are either engaged (where resourcing allows) or authentically considered (Lukasiewicz 2017).

Embedding transparency into engagement, planning and operation activities and discussing limitations is key to fostering trust in the process and respect for the decision-making authority. Be clear and transparent about the scope (limitations) of authority and communicate that to stakeholders (Lukasiewicz 2017).

While many current initiatives address disaster resilience, some conditions inhibit action and impact. There are many views as to why these conditions exist, some include:

- Deeply entrenched models and paradigms – indifference to those from 'the outside' with new ideas and knowledge.
- Disincentives in the system to collaborate – governance, procurement, competitive environment.
- No permission to fail – the pressure to 'get it right' means people aren't given the freedom to fail and learn. They don't have the power/means to act and there are no safe environments in which to innovate and experiment
- Limited investment in human connectivity across the system.

To apply this principle:

Avoid using risk management processes that entrench differences and transfer risk to the most vulnerable and disadvantaged sections of a community, organisation, or government.

Consciously and actively broaden engagement to include wider sets of interested and affected people and design processes to reveal, promote deliberation and negotiate differences (often contested) in values, power, and knowledge between participants and across systems (Eisenhauer 2016). Provide stakeholders and communities with access to the decision-making process and expertise in some form (directly or indirectly).

Learn the art of collaboration to help build trust and a greater awareness of the risk landscape by connecting diversity of knowledge and experience. Engaging with external stakeholder groups in this way also enables greater opportunity to learn from each other. Collaborating involves building a network that spans sectors and includes a broad range of skills and experiences.

To learn more:

Anna Lukasiewicz, Stephen Dovers, Libby Robin, Jennifer McKay, Steven Schilizzi, Sonia Graham (Eds), *Natural Resources and Environmental Justice: Australian Perspectives*, Victoria: CSIRO Publishing.

Australian Institute for Disaster Resilience 2020, *Community Engagement for Disaster Resilience*, knowledge.aidr.org.au/resources/handbook-community-engagement

CSIRO 2020, *The Resilience, Adaptation Pathways and Transformation Approach (RAPTA): A guide to designing, implementing and assessing interventions for sustainable futures*, research.csiro.au/eap/rapta

Lukasiewicz A 2017, *The Social Justice Framework: Untangling the maze of justice complexities*, In: A. Lukasiewicz et al. (eds) *Natural Resources and Environmental Justice: Australian Perspectives*, Victoria: CSIRO Publishing, pp 233-251.

2.4 Treat decision-making as an active learning process

'Establishing active learning practices helps build capacity for responding to rapid, unprecedented change for which there are no tested solutions.'

(Resilience Adaptation Pathways and Transformation Approach, 2020)

Active learning helps both adaptation of actions being implemented, and the achievement of objectives. The overall decision-making strategy here is to act early, assess how the system is responding and then adapt accordingly.

While better management of information and new approaches to complexity may well assist in decision-making under uncertainty, the actual nature of decision-making also needs to change. This includes the processes decision makers use and how they interact with their stakeholders.

Continually develop approaches to defining problems (assessing risks) and implementing solutions (treating risks). This is needed because of the novelty of events and uncertainty of disaster risk. An active learning¹¹ approach applies an assessment of both the problem and the implementation of solutions to avoid separating them from each other.

To apply this principle:

Learn to use different approaches to decision-making where people recognise that in novel contexts experience and analysis may not result in the right decision. Any decision or course of action should be regarded as a carefully considered trial or interim measure, to be evaluated and then revised. Evaluate in terms of effectiveness (Did it work as expected? Did that help solve the problem?) and acceptability (Did the outcome achieve what people wanted in the circumstance? Were any associated negative impacts acceptable?).

Develop these capacities in decision makers and the experts, analysts, and communities they rely on. Consider building knowledge brokering capabilities and remember to establish the nature and context of the decision before determining what knowledge brokering capabilities are needed.

11 Ansell C, Geyer R 2017, 'Pragmatic complexity' a new foundation for moving beyond 'evidence-based policy making'?, *Policy Studies*, vol. 38, pp 149 – 167

To learn more:

Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. Strategic Guidance: 02 Guidance on Governance*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. Strategic Guidance: 03 Guidance on Vulnerability*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

Australian Institute for Disaster Resilience 2020, *Community Engagement for Disaster Resilience*, knowledge.aidr.org.au/resources/handbook-community-engagement

Australian Institute for Disaster Resilience 2020, *Lessons Management*, knowledge.aidr.org.au/resources/lessons-management-handbook

Cognitive Edge 2020, www.cognitive-edge.com

Think about...

- Identify your shared and individual responsibilities. Noting that it is important to be accountable, identifying the responsibilities you have in macro and micro-scale help to develop your approach.
- Identify your support networks or stakeholders and establish strong connections with them. Using your imagined scenarios, identify where collaboration will be necessary. Recall in this process that despite low probability in the scenario, the severity of impact also drives the need to consider.
- Work with your support networks or stakeholders to ensure that you identify collaboration barriers such as communication, capability, attitudes and systemic or organisational restrictions. Develop strategies to overcome these barriers or identify the relevant skills required to successfully dissolve them.
- Consult with your identified networks and/or stakeholders to align key principles and core values. For example, in private industry, shareholders and clients may have differing values. There may be an extensive effort needed to achieve agreed views. It is important during this time not to compromise and distort the science of climate change.



3. Re-think disaster risk methods

'Across the world, the growing complexity and interaction of human, economic and political systems mean the risks are becoming increasingly systemic and we have routinely failed to correctly understand and portray their impacts.'

(UNDRR 2019, Global Assessment of Risk, GAR Distilled)

Disaster risk management is evolving to include systemic disaster risk reduction and resilience.

In the last few decades calls to rethink disaster risk management and climate change adaptation have produced reports aimed mostly at helping governments and institutions deal with the twin challenges of extreme weather-related disasters and adapting to the impacts of climate change¹².

Addressing long-term issues will require setting longer time horizons and doing things differently, not simply better or more efficiently¹³. However, we are mostly not well set up to do different things at large scales. This difficulty is illustrated in debates in Australia about emissions/energy policy and the response to the global pandemic for example. The introduction of new objectives (reducing emissions and public health lockdown measures) was initially acceptable, but when it was clear that they would clash with existing norms they became highly contested in decision-making, expert analysis, and commentary in the community.

Consequently, there is a need for fresh approaches to resilience and adaptation investment, risk assessment and decision-making involving expertise from across scientific domains, from all sectors of society and in ways that involve inclusive governance. Altering structural incentives and formulating a common purpose and new objectives is a way to do this.

Revisit, restart, or change the risk approach as circumstances change. For example, prior to the COVID-19 pandemic many organisations were focused on disaster risk reduction in the context of climate change and extreme weather and considered a pandemic unlikely. Both the impact of the pandemic and the opportunities it presented changed the whole risk equation and demonstrated that likelihood does not diminish consequence.

Select and use the right risk methodology. Choose the approach and level of detail to assess disaster risks to match the types of decisions that need to be made and the timeline in which to make them. The test of whether it is the right method is determined by the outcome of good, low-regret decisions.

A full detailed risk assessment may not be needed every time. Such assessments are important however, risk reduction measures can be acted on at any time and resolved even before it makes it to a formal process.

The principles in this chapter focus on placing people and their values at the centre, and evolving risk and resilience thinking beyond emergency risk assessments. It encourages the use of a systems approach to discover values and vulnerabilities, avoid an imbalance of knowledge and help people use risk information to more effect.

¹² Howes, M, Grant-Smith, D, Reis, K, Bosomworth, K, Tangney, P, Heazle, M, McEvoy, D & Burton, P 2013, *Rethinking disaster risk management and climate change adaptation*, National Climate Change Adaptation Research Facility, Gold Coast

¹³ European Institute of Innovation and Technology Climate Knowledge and Innovation Community 2021, Deep Demonstrations <https://www.climate-kic.org/programmes/deep-demonstrations>

10	<p>Re-evaluate purpose and priorities</p> <p>Evolve disaster risk management to include systemic disaster risk reduction and resilience. Focus on people, place, and values and be clear on purpose and objectives. Align these with local, place-based accountable decisions and longer-term time horizons.</p>
11	<p>Take a systems approach</p> <p>Use a systems approach to illuminate complex interconnections and relationships. With this understanding it is possible to select the best intervention points for action.</p>
12	<p>Recognise values, vulnerability, and social justice</p> <p>Change purpose and objectives when values change. Be transparent about why particular decisions were chosen over others and work with stakeholders to agree on the goals and objectives for reducing disaster risk.</p>
13	<p>Provide equitable access to risk knowledge</p> <p>Regularly talk about the progress of a disaster risk reduction and resilience activity. It fosters trust and participation, allowing risk owners the opportunity to accept, treat or transfer the risk. Engage and support people to understand and use risk information to more effect and avoid an imbalance of knowledge and power.</p>

To learn more:

Australian Institute for Disaster Resilience 2020, *National Emergency Risk Assessment Guidelines*, **knowledge.aidr.org.au/resources/handbook-national-emergency-risk-assessment-guidelines**

Brooks, B & Curnin, S 2021, Stretch-thinking Loops: A New Technique for Scenario Planning, *Risks, Hazards and Crisis in Public Policy*, vol. 12, no. 1, p 110-124.

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Queensland Government 2020, *Queensland Resilience, Adaptation Pathways and Transformation Approach (QRAPTA)*, **www.qra.qld.gov.au/our-work/resilience/queensland-resilience-adaptation-pathways-and-transformation-approach-project**

Standards Australia & International Electrotechnical Commission 2020, *AS/NZS IEC 31010:2020 Risk management – Risk assessment techniques*, **www.standards.org.au/standards-catalogue/sa-snz/publicsafety/qr-005/as-slash-nzs--iec--31010-colon-2020**

United Nations Office for Disaster Risk Reduction 2017, *Words Into Action Guidelines: National Disaster Risk Assessment, Governance System, Methodologies And Use Of Results*, **www.undrr.org/publication/words-action-guidelines-national-disaster-risk-assessment**

Think about...

- Have you determined the type of decision you need to make before you choose the risk assessment method to use?
- Have you sought a wide range of views?
- What is an acceptable level of risk and for whom?
- Which groups will benefit from the risk reduction measure and which groups will bear the cost?
- What new thinking is most relevant to your risk practice?
- Do you need to upskill or reach out to expertise across your community?

3.1 Re-evaluate purpose and priorities

'The realisation of systemic risk by definition leads to a breakdown, or at least a major dysfunction, of the system as a whole'.

(Global Assessment Report on Disaster Risk Reduction, 2019)

Purpose can be defined as the reason why systemic disaster risk reduction actions are undertaken, and shapes how certain investments and decisions are valued. In terms of a business or organisation, it is used to develop the goal(s) and objectives of the disaster risk reduction and resilience activity. A well-defined purpose provides a reference point for other considerations, such as who and what needs to be included and which risk or resilience management process to select.

Purpose-based approaches place people and their values at the centre of disaster risk reduction and resilience activity. Most hazards lead to disaster when they disrupt the values of an exposed and vulnerable society and when the consequences exceed people's capacity to cope. This vulnerability is the result of the conscious and unconscious decisions that have been made and continue to be made about where and how we live our lives, where and how we build our homes and communities, and the placement and effectiveness of the critical infrastructure that supports them.

Purpose guides priority setting, key considerations of how values are aligned, and how collaboration will occur. It is key to enabling accountable decisions and establishing long-term time horizons. As the risk context changes, it may be necessary to reassess priorities, goals and objectives.

To apply this principle:

Continually refine purpose and priorities using a rapid diagnosis of the decision context and inclusive governance arrangements. There are multiple tools that can help with this, for example the *Cynefin Framework*, vulnerability assessment approach¹⁴ or a simple PESTLE analysis to assess drivers of risk.

Be transparent why some decisions were made over others and be prepared to explain the effect those decisions will have.

To learn more:

Cynefin Framework www.mindtools.com/pages/article/cynefin-framework.htm

PESTLE analysis: pestleanalysis.com/what-is-pestle-analysis

Queensland Government 2020, *The Resilience Checklist – a guide for doing things differently and acting collectively*, www.qra.qld.gov.au/sites/default/files/2020-11/a_resilience_checklist_-_a_guide_for_doing_things_differently_and_acting_collectively.pdf

UNDRR Asia-Pacific, Ecosystem-based Disaster Risk Reduction, Implementing Nature-based Solutions for Resilience, www.undrr.org/publication/ecosystem-based-disaster-risk-reduction-implementing-nature-based-solutions-0?utm_source=LinkedIn&utm_campaign=PreventionSavesLives

¹⁴ Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. 3 Guidance on 03 Guidance on Vulnerability*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

3.2 Take a systems approach

'We need to inquire why and how do naturally occurring events lead to devastating suffering and loss.'

(Mark Crossweller 2021)

The report *Profiling Australia's Vulnerability* (Australian Government 2018) refers to four interconnected patterns of systemic vulnerability:

- placement of communities, infrastructure, and assets
- access and supply of essential information, goods, and services
- risk assessment, ownership, and transfer
- governance and organised decision-making.

Using these systems patterns as a starting point, think about the choices and decisions made, by whom and over what timeframe, that create the conditions for disaster. These choices and decisions are where risk is created; knowledge, wealth, power is traded, and risk ownership transferred (whether this happens knowingly or unknowingly). Taking a systems approach requires a focused effort, an investment of resources and doing a better job of valuing the benefits of resilient investment and decision-making. This includes direct and indirect, tangible and intangible benefits that may only be realised after a disaster or in the absence of a disaster¹⁵. In doing so, and through improvement and resilience building, future events may be prevented from becoming disasters.

The growing connectivity and interdependency of the systems on which society depends requires a corresponding understanding of networked vulnerability at all levels (e.g. energy, water, food, health and education services, transport, and communications). Infrastructure Australia considers such interdependencies in four tiers¹⁶:

- asset
- community
- networks and place
- governance and coordination.

Taking a system view creates an understanding of how these separate parts interact. It also reveals the interplay between values, rules, and knowledge¹⁷ which are often left out when viewed independently. Taking a systems view sheds light on these relationships and allows them to be considered from multiple stakeholder perspectives.

Which systems analysis tool to use depends on the context, time, and resources available. One approach is to visualise the system(s) being assessed, for example:

- Develop a simple cause-effect diagram: bring diverse groups together to share their perspectives. Often people have completely different ideas about how a system works. Gaining an understanding of each other's perspectives is especially useful.
- Even a messy, raw diagram will help to elicit different people's mental models and provide an object for discussion of underlying cause-and-effect mechanisms. It can show where there may be feedbacks, where better information might be required, where consequences amplify feedbacks, and where there may be patterns emerging.
- More experienced practitioners will use more advanced systems modelling tools and approaches to explore more complex patterns embedded in diagrams. A higher level of systems analysis skill will build capacity to produce simplified causal loops, diagnose points of intervention and design the interventions themselves.
- Use a cause-and-effect checklist: set factors and boundaries to describe what is in a system and what is not. *The Global Risk Assessment Framework* (GRAF) (UNDRR 2020) includes a version of a checklist. Use it to evolve proactive risk practices and culture.

To apply this principle:

Attain stakeholder input into any disaster risk reduction, resilience management and systems mapping activities to surface all available knowledge. Tools such as the Resilience Adaptation Pathways and Transformation Approach (RAPTA) can be used to do this.

¹⁵ Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. 5 Guidance on Prioritisation*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

¹⁶ Infrastructure Australia 2021, *Sustainability Principles: Infrastructure Australia's approach to sustainability*, www.infrastructureaustralia.gov.au/sites/default/files/2021-04/IA%20Sustainability%20Principles_final_2.pdf

¹⁷ Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making. 3 Guidance on Vulnerability*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance

To learn more:

Australian Government 2017, National Resilience Taskforce: Deconstructing Disaster, the strategic case for developing the *Australian Vulnerability Profile* to enhance national preparedness

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3.3 Recognise values, vulnerability and social justice

'To increase resilience a deep understanding of vulnerability is required; understanding that contributes to the shaping of risk governance.'

(Marc Gordon 2020)

Recognise and acknowledge competing values (you cannot achieve all of them) and be transparent about why particular decisions were chosen over others (Lukasiewicz et al 2017; Lukasiewicz 2020). Values and transparency are a key consideration in establishing and maintaining community trust, sharing responsibility and prioritisation, decision-making, and resource allocation.

Vulnerability arises from the relationship with what is valued and what may be disrupted or lost. Understanding and explicitly highlighting values and tensions and trade-offs between them helps prioritise time, effort and money and contributes to being better prepared¹⁸.

Australian disaster management operates under the concept of 'shared responsibility'¹⁹ – the idea that all sectors of society (not just government) have some responsibility in disaster risk reduction. While the concept is well-accepted, it is difficult to operationalise on the ground. There is continued debate, misunderstanding and a lack of acceptance as to who should bear responsibility for what, and people continue to look to government for support during disasters²⁰.

Deciding what values should influence decisions can often be beyond the remit of those involved in disaster risk assessment and is left up to the implementers of the decisions. In disaster management, risk assessment is often separate to implementation – those who assess and prioritise risks are often not the same people who implement risk reduction measures, and the two groups may use different value judgements.

Risk reduction or management includes resource allocation, for example, a government providing grants to homeowners to improve disaster preparedness, a small business taking out flood insurance, a local council deciding to build a sea wall. All these decisions result in benefits to some and costs (including lost opportunity costs) to others. Few decisions are totally free of potentially negative consequences.

Any decision taken, or not taken, has consequences for different stakeholders. The implementation of disaster risk reduction measures may end up redistributing wealth, power, and resources across society. Whether or not this is 'fair' depends partly on values. For example, flood insurance can be a significant, prohibitive cost to those who do not have the financial capacity²¹. There is potential for those who are socio-economically disadvantaged to enter a negative spiral, as a lack of resources for disaster risk reduction and mitigation is likely to result in greater losses during a disaster, meaning fewer resources are available to rebuild and to prepare for the next one.

¹⁸ Australian Government Department of Home Affairs 2018, *Profiling Australia's Vulnerability: The interconnected causes and cascading effects of systemic disaster risk*, knowledge.aidr.org.au/resources/profiling-australias-vulnerability

¹⁹ Council of Australian Governments 2011, *National Strategy for Disaster Resilience*, knowledge.aidr.org.au/resources/national-strategy-for-disaster-resilience

²⁰ The Conversation, Dale Dominey-Howes 2021, *You can't talk about disaster risk reduction without talking about inequality*

²¹ Australian Broadcasting Corporation, Donnellan, A & Hose, N 2021, *Like many Australians, Joe couldn't afford to take out flood insurance. Now he's paying the price*, www.abc.net.au/news/2021-03-25/dream-home-ruined-by-floods-no-insurance-high-premiums/100029530

To apply this principle:

Create a safe space to discuss novel and broad concepts. Creating a safe space is an important leadership activity and involves balancing a sensitive, pragmatic, and courageous approach.²²

Effective discussion of values, vulnerability and fairness can be demanding. If the conversation stays too close to the current paradigm, it may not create potential for change. If it moves too far beyond people's current knowledge this could lead to resistance, mistrust or even outrage.

Strategic Guidance 03: Guidance on Vulnerabilities (Australian Government 2019) can assist to design effective engagement approaches.

To learn more:

Bushfire and Natural Hazards CRC 2020, Australian Disaster Resilience Index
adri.bnhcrc.com.au

Council of Australian Governments 2011, National Strategy for Disaster Resilience,
knowledge.aidr.org.au/resources/national-strategy-for-disaster-resilience

Lukasiewicz, A 2017, The Social Justice Framework: Untangling the maze of justice complexities, In: A. Lukasiewicz et al. (eds) *Natural Resources and Environmental Justice: Australian Perspectives*, Victoria: CSIRO Publishing, pp 233-251.

United Nations Office for Disaster Risk Reduction 2019, *Global Risk Assessment Framework* (GRAF)
www.preventionweb.net/understanding-disaster-risk

3.4 Provide equitable access to risk knowledge

'Knowledge is not power. Power is power. The ability to act on knowledge is power.'

(Michael Schrage)

The outputs of formal and informal risk assessment are inputs into decision-making. The importance of communicating both outputs and decisions made is a key element for fostering trust and participation, and allowing risk owners an opportunity to accept, treat or transfer the risk.

Regularly discussing the progress of a disaster risk reduction or resilience activity is an effective way to reach out and engage all relevant stakeholders in ongoing discussions. It also demonstrates a shared commitment to the outcomes, enables two-way feedback and avoids creating an imbalance of knowledge and power where some groups have an advantage due to greater access to information.

Risk information is produced and disseminated in many forms, over different time scales and covering different contexts. Such risk information is used for multiple purposes, including:

- communicating, escalating, and/or referring priority risks within governance arrangements and to the community
- prioritising mitigation and risk reduction initiatives and activities across sectors
- embedding the understanding of hazards and their associated risks within strategic and operational plans
- embedding existing and planned risk reduction strategies within strategic and operational plans
- embedding risks, mitigation and risk reduction activities within business continuity plans and business as usual activities.

²² Australian Government, Department of Home Affairs 2019, *Climate and Disaster Risk: What they are, why they matter and how to consider them in decision making*. 3 *Guidance on Vulnerability*, knowledge.aidr.org.au/resources/strategic-disaster-risk-assessment-guidance/

The level and quality of communication and engagement reflects perceptions of the value of the process and potential barriers. Value is demonstrated when communities and partners:

- commit time and effort to establishing and maintaining mutual trust
- demonstrate shared commitment to achieving beneficial outcomes or solve problems for the community
- demonstrate ongoing commitment to building and maintaining relationships with one another before, during and after disasters and emergency events
- include a diversity of perspectives and experiences
- communicate clearly to reach agreement, or where agreement is not possible, to accept and manage any differences
- develop creative responses together, to address challenges and opportunities.

To apply this principle:

Complex, technical language can be a barrier to understanding risk, and hard to translate. Break down complex risk information and any technical materials into digestible pieces, using straightforward language if possible. This may require an investment in building knowledge brokering capacity and competencies to be able to do this.

Re-engage stakeholders in a review of the final products to validate the results and obtain endorsement from those affected by any risk decisions. Clarify risk ownership and responsibility. Engaging in this way supports people understand and use the results to more effect, while demonstrating the value of inclusive governance.

To learn more:

Australian Government 2021, *Australian Climate Service*, www.acs.gov.au

Australian Institute for Disaster Resilience 2020, *Community Engagement for Disaster Resilience*, knowledge.aidr.org.au/resources/handbook-community-engagement

Australian Business Roundtable for Disaster Resilience and Safer Communities 2014, *Building an Open Platform for Natural Disaster Resilience Decisions*, australianbusinessroundtable.com.au/assets/Building%20an%20Open%20Platform%20for%20Natural%20Disaster%20Resilience%20Decisions%20CLEAN.pdf

UNESCO, *Sustainable Development Goals for Communication and Information*, en.unesco.org/sustainable-development-goals-for-communication-information

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United Nations Office for Disaster Risk Reduction 2011, *Disaster Through a Different Lens: behind every effect, there is a cause*, www.undrr.org/publication/disaster-through-different-lens-behind-every-effect-there-cause

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