

Executive Summary

The financial and emotional burden of natural disasters in Australia has been great and the costs of extreme weather events continue to rise.

To help make better, more informed decisions regarding safety from and resilience to natural disasters, it is imperative that communities, businesses and governments can access the latest research founded on accurate data.

The stakes are high

This report builds on previous work commissioned by the *Australian Business Roundtable for Disaster Resilience and Safer Communities*, which analysed the opportunities for Australia to design a more sustainable and comprehensive national approach to making communities safer and more resilient.

'Building our Nation's Resilience to Natural Disasters' demonstrated that the economic cost of natural disasters to Australian communities amounts to an average of \$6.3 billion per year, with \$700 million of that borne by all levels of government, the majority of which is spent on post disaster relief and recovery. By 2050, this is forecast to rise to \$23 billion per year, with a total government budget impact of around \$2.3 billion annually in present value terms.

Carefully targeted disaster mitigation investments can reduce these costs. For example, an annual investment of \$250 million over the period to 2050 could generate government savings of around \$12.2 billion, in present value terms, if carefully targeted to achieve an overall benefit-cost ratio of 1.25.

Providing wider access to accurate, relevant natural disaster data and research could increase government savings by between \$500m and \$2.4 billion in present value terms, over the period to 2050. Data and research which facilitates targeted and prioritised investment has the potential to deliver higher overall benefit-cost ratios of between 1.3 and 1.5. Based on this, total savings to government could rise to anywhere between \$12.7 and \$14.6 billion in present value terms, over the period to 2050.

However, without access to critical data and research, communities, businesses and governments cannot make informed decisions on how to target these investments to achieve the greatest impact.

This report investigates the decision-making challenge and identifies the strengths and weaknesses of Australia's approach to natural disaster data and research. It recommends a way forward to support Australia as it designs a more sustainable and comprehensive national approach to making communities safer and more resilient.

Notably, the effectiveness and sustainability of Australia's natural disaster funding arrangements is currently the subject of a Productivity Commission Inquiry. The purpose of the Inquiry is to identify reforms to achieve a balance between recovery and mitigation to help communities better prepare for disasters.

The decision-making challenge

Accurate data and research is fundamental to better understanding natural disasters and their impact on communities, businesses and governments. It is essential to supporting better decision-making and prioritising mitigation investments to build a safer Australia.

Optimal decisions on resilience investments require access to high quality data and research.

However, the process of linking data and research to end users for optimal decision-making is a challenge faced by many countries. Natural disaster resilience is an interdisciplinary issue. Multiple agencies are involved in collecting data and undertaking research. This results in numerous platforms to access and utilise the range of necessary information, increased search costs and complexity and disparity in understanding.

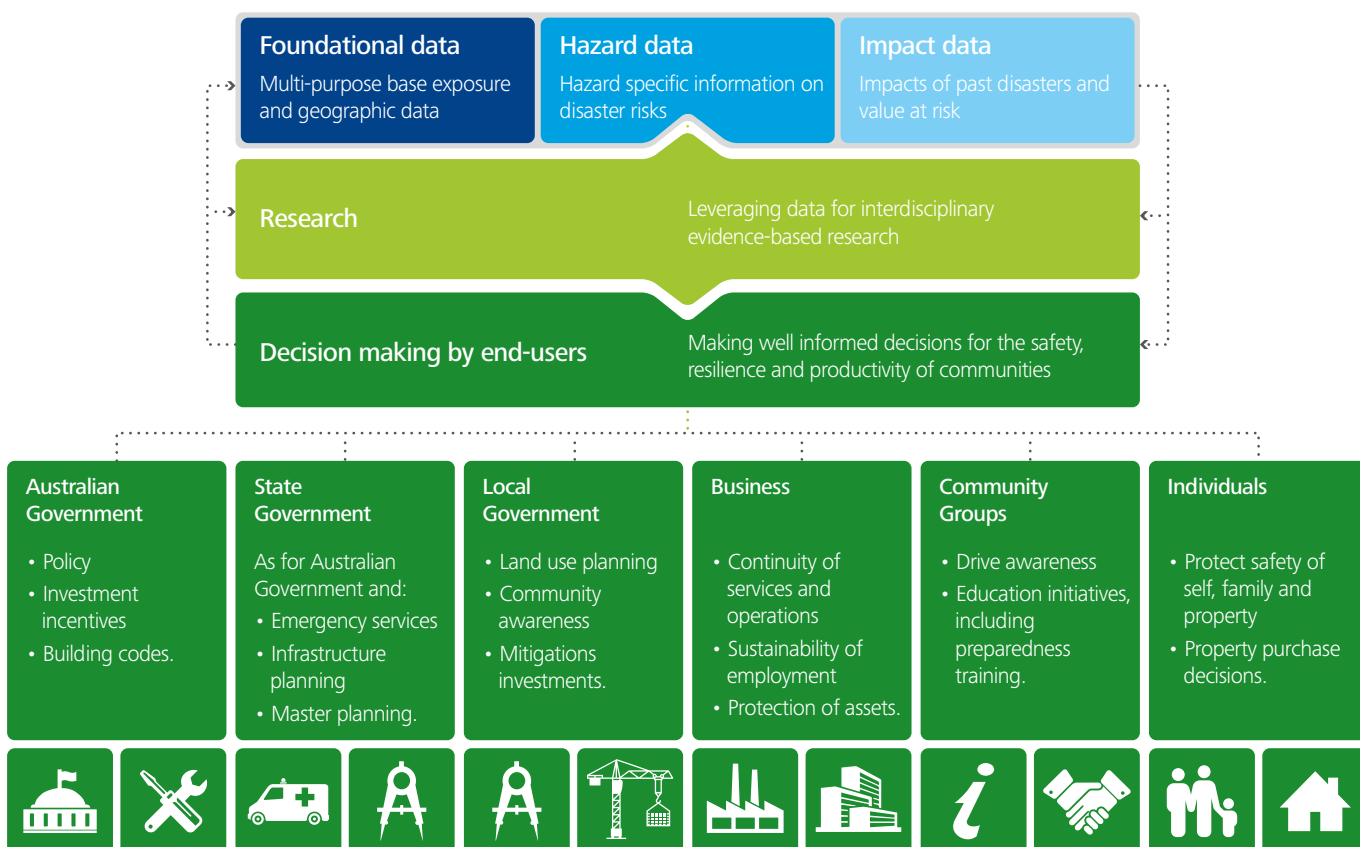
As illustrated in Figure i below, the key set of inputs required by end users consists of:

- **Foundational data** – data that provides the basic layers of locational information. This includes information on the characteristics of assets at risk, community demographics, topography and weather, and is also used for a range of other purposes.
- **Hazard data** – hazard specific information on the risks of different disaster types, providing contextual data about the history of events and the risk profile for Australian locations.
- **Impact data** – data on the potential and actual impacts associated with natural disasters, including information on historical costs and damage, and the current and predicted future value at risk.

- **Research activities** – activities that draw on data and seek to answer specific research questions across a range of areas. There is often also feedback from research to data, where research outputs build on the existing stock of data that is available.

The information needs of end users across communities, businesses and governments vary significantly. In order to increase the safety, resilience and productivity of Australian communities, it is imperative that data and research is accessible in consistent formats and is fit for a variety of purposes.

Figure i: Data and research inputs for optimal decision-making on resilience investments



Source: Deloitte Access Economics, *Australian Business Roundtable for Disaster Resilience and Safer Communities* (2014)

Current activities

Australian and state government policies recognise the importance of providing access to information and in supporting research activities to drive resilience and productivity. For instance, through the 2010 Declaration of Open Government, the Australian Government publically committed to providing public sector information that is useable and accessible (Department of Finance, 2010).

This is consistent with experiences in international jurisdictions and other sectors in Australia, such as the US Open Government Initiative, the National Observatory for Natural Hazards in France, and the approach to the curation and supply of financial data undertaken by the Australian not-for-profit company, Sirca.

In practice, a large number of stakeholders across Australia are making valuable contributions to the body of knowledge on natural disasters and resilience, combining expertise from numerous disciplines, including earth science, psychology, health, engineering, construction, economics and information technology. This encompasses at least seven Australian Government departments and agencies, all eight state and territory governments, many local councils, six major research institutions, 24 universities and numerous private sector firms and agencies.

While the total costs of data collection are uncertain, this review has identified over \$283 million in public funding for natural disaster research activities in Australia between 2009 to 2021. Over 40% of this investment is directed towards disaster risk reduction research efforts, with the remaining 60% allocated to research on disaster response and recovery.

Notably, significant barriers remain that restrict optimal decision-making that is dependent on and informed by data and research. This limits our progress towards a more resilient Australia.

Gaps and barriers to optimal decision-making

The approach to data and research into natural disasters in Australia has no comprehensive mechanisms to ensure that these inputs are available in a consistent and appropriate format for the spectrum of end users involved in decision-making. This review highlights some of the key barriers and gaps in the data and research systems, respectively.

Data

There is evidence of gaps in the critical data inputs required to inform resilience investments. This significantly limits the ability of various stakeholders to understand the exposure of different communities and the true extent of losses that might arise should a natural disaster occur.

These issues are compounded by barriers which restrict access by end users to critical data. These barriers include:

- **Reluctance to share data** – for example, the potential legal implications from data sharing are an issue of particular concern for local government
- **Restrictive licensing arrangements** which prevent wider distribution and use of data
- **High costs of collection** which encourages a piecemeal approach to the development of critical data inputs
- **A lack of co-ordination and standardisation**, which impedes the ability of end users to pull together data from different sources on a consistent basis
- **High cost of providing accessibility and transparency** which weakens incentives for data sharing where the broader range of benefits are unclear.

These barriers lead to duplication of data collection, higher transaction costs of using data and restricted access for end users. To the extent that the benefits for the full range of end users exceed the costs of providing data, the current arrangement is inefficient, and fails to deliver the best outcome for Australian communities and taxpayers.

Research

From the evidence of research activities **identified** by this review, it has been found that **less funding** is directed towards understanding the **effect of mitigation, value at risk** and the **process of coping with natural disasters** compared with other areas of research such as risk management, vulnerability, hazard detection, policy and decision support. This limits the ability of decision-makers to understand the baseline costs associated with exposure to natural disasters, as well as the benefits that could be achieved through mitigation.

Furthermore, while it is evident that there are strong networks among Australian researchers, from an end user perspective it is difficult to identify what relevant research activities are being undertaken, and to leverage research findings to better inform decision-making on resilience investments. While projects undertaken by the newly established Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC) explicitly involve end users, this practice should be adopted more broadly. This could be supported through better transparency and evaluation of the outcomes of research activities.

Recommendations

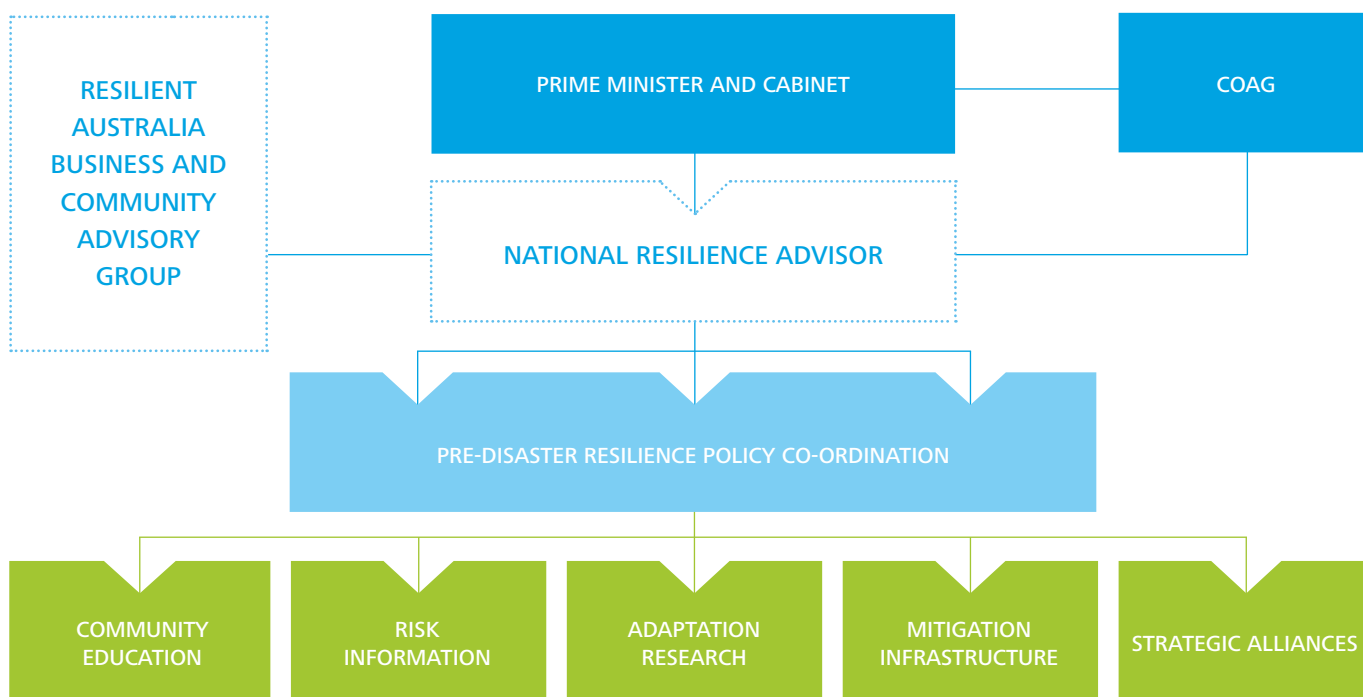
Consistent with the recommendation of *'Building our Nation's Resilience to Natural Disasters'*, a National Resilience Advisor within the Department of Prime Minister and Cabinet would be well placed to address these issues. Developing resilient communities should be elevated to the centre of government decision-making to deliver effective and efficient co-ordination of activities across all levels of government, business and communities.

Specifically, there is a need for continuous involvement of the full spectrum of end users in the development and application of natural disaster data and research, to unlock the full potential of Australia's data and research capabilities.

This should be directly supported by a Business and Community Advisory Group to facilitate a more co-ordinated response and ensure that business and the not-for-profit sector are represented at the highest levels of policy development and decision-making.

This approach is described in Figure ii below.

Figure ii: Building a more resilient Australia



PRINCIPLE: CENTRAL GOVERNMENT FOCUS WITH STRONG SUPPORT FROM BUSINESS TO ADDRESS THE CO-ORDINATION CHALLENGE

Source: Deloitte Access Economics, *Australian Business Roundtable for Disaster Resilience and Safer Communities* (2013)

This report makes three recommendations for an enhanced approach to natural disaster information. The recommendations focus on the benefits possible through optimal end user decisions around data and research:

1 Efficient and open - deliver a national platform for foundational data

Given that foundational data is used for a broad range of purposes, beyond the scope of natural disaster issues, the Australian Government should provide a single point of access for all Australians. While weather information and data on community demographics is consistently provided by the Bureau of Meteorology and the Australian Bureau of Statistics respectively, allocation of responsibility for consistent topography and geocoded asset data at the national level is required. A national platform for this broader key data would facilitate prioritisation across local government and state borders in the national interest.

2 Transparent and available - remove barriers to accessibility of data and research

Access to data and research is restricted. Greater transparency across the system is required to identify the full range of end users and allow for the development of a system of optimal access which weighs up overall costs and benefits. There is a need for clear delegation of responsibility for hazard and impact data (such as hazard mapping) and a stronger approach for involving end users in research. This should also address concerns with legal liability, unnecessarily restrictive licensing and ensure standardisation across jurisdictions.

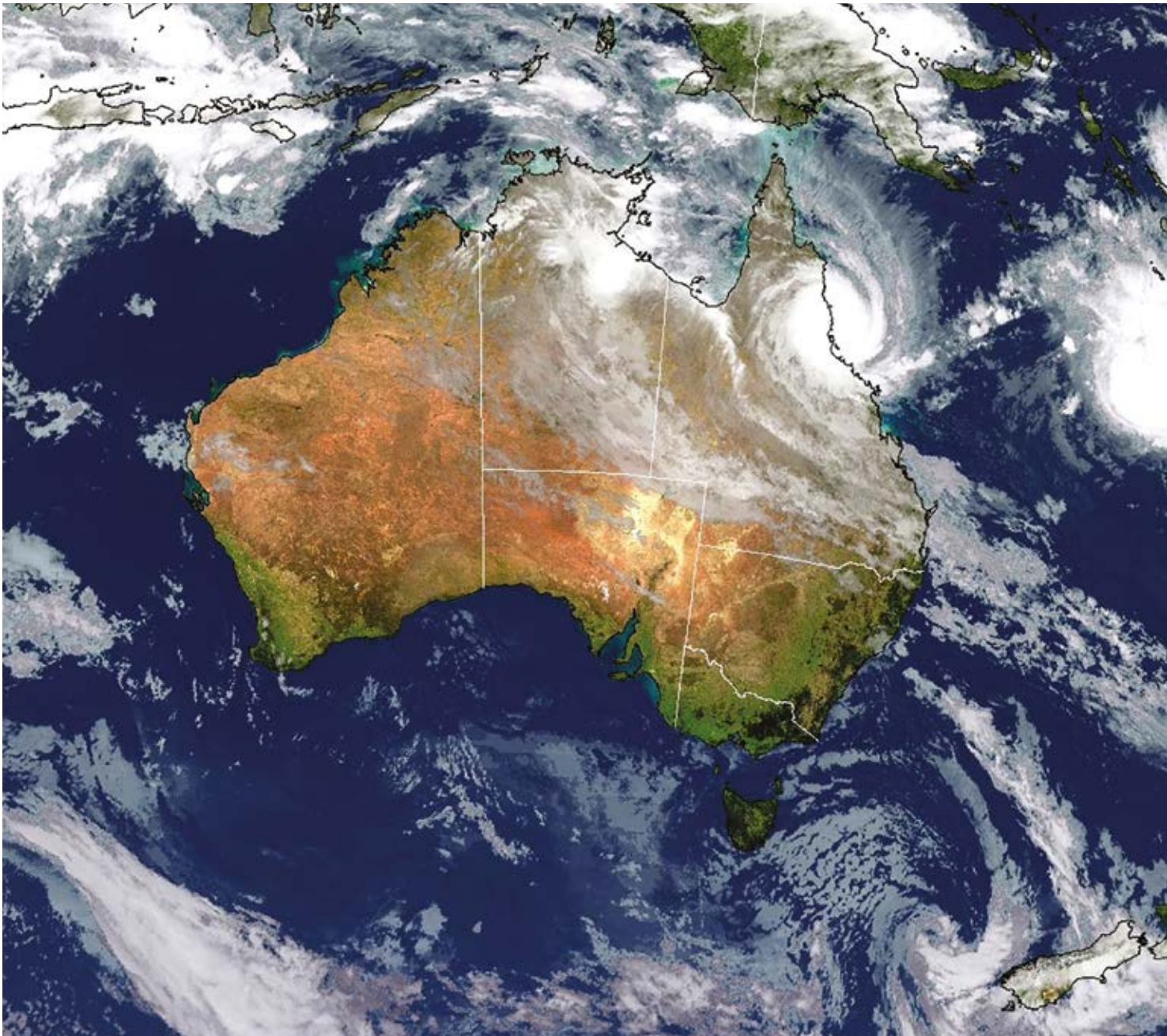
3 Enabling effective decision-making - establish a prioritisation framework

A national prioritisation framework for investment in resilience should be established, consistent with the approach adopted by Infrastructure Australia¹. This will enable best practice use of natural hazard data and research to be collected and disseminated and ensure an optimal outcome from investment in resilience for Australia, through focus on consistent, evidence-based cost-benefit analyses. This approach would build a common understanding of the nation's areas of highest risk and also the most effective measures to reduce that risk and assist in prioritising the research agenda.

Conclusion

These recommendations will help to unlock the full potential of data and research, and reduce the burden of natural disasters on the Australian economy and our communities, however they can only be achieved through a shared effort by governments, businesses and communities.

¹ Infrastructure Australia's Priority List identifies projects of national significance and informs the government of the highest priority projects. Guidelines for cost-benefit analysis, step-by-step methodologies for different investment types and links to standardised data sources are provided by Infrastructure Australia to assist in the preparation of submissions. Further details on this approach are provided in Chapter 6.



Bureau of Meteorology: Satellite image showing a cloud/surface composite over Australia as Cyclone Ita moves toward the Far North Queensland coast, April 2014.