

Appendix A: Building our nation's resilience to natural disasters

In June 2013, the paper, *'Building our Nation's Resilience to Natural Disasters'*, was released by Deloitte Access Economics in conjunction with the *Australian Business Roundtable for Disaster Resilience and Safer Communities*.

The paper highlighted the need for a new approach to investment in pre-disaster resilience across Australia to reduce the economic costs, relieve long-term pressures on government budgets and, most importantly, minimise the longer-term social and psychological impacts of natural disasters.

This appendix summarises the findings of the paper, focusing on particular areas of relevance for this report.

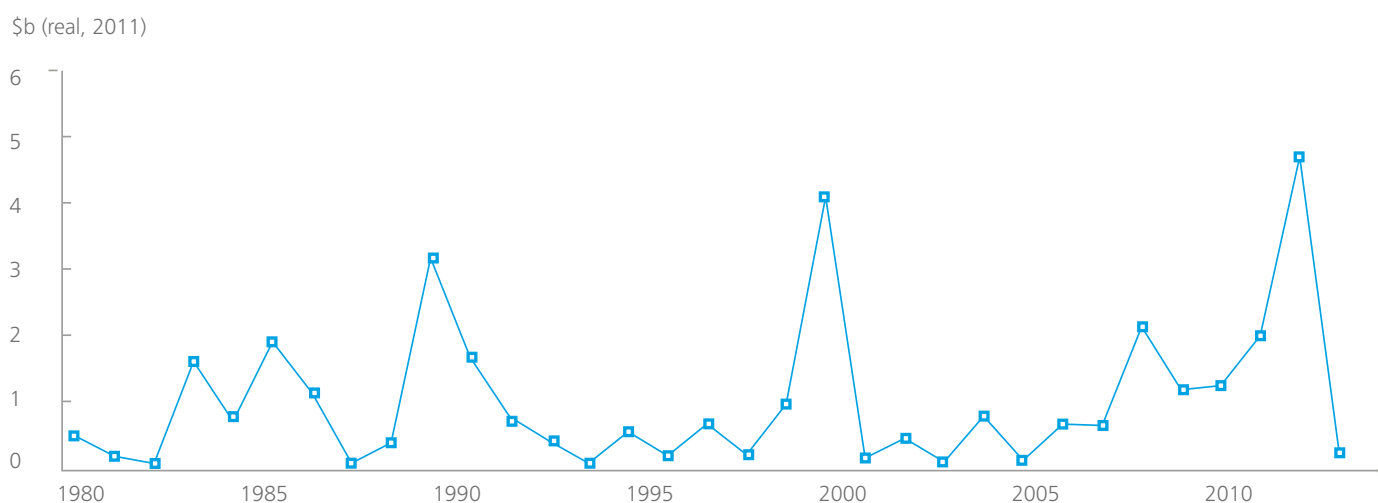
Disaster risks in Australia

Australian communities are exposed to a wide range of natural disasters, including storms, cyclones, floods, bushfires and earthquakes. These disasters have devastating impacts including damage to homes, critical infrastructure and the natural environment, the loss of human life, injury and longer-term social, community and psychological costs.

Between 1967 and 2012, Australia experienced an average of at least four major natural disasters per year where the insured loss exceeded \$10 million (Insurance Council of Australia, 2013). In addition, there have been numerous smaller-scale disasters with equally devastating local consequences. Chart A.1 illustrates the extent of insured losses from natural disasters in Australia between 1980 and 2012.

It is important to recognise that these losses only represent a proportion of the total economic costs of natural disasters. In addition to insured losses, total economic costs incorporate the cost of damage to uninsured property and infrastructure, costs of emergency response and intangible costs such as death, injury, relocation and stress. Historically, it has been estimated that total costs are between two and five times greater than insured costs alone for most types of disaster (BTE, 2001).

Chart A.1: Insured costs of natural disasters (\$bn), 1980-2012



Source: Insurance Council of Australia (2013)

Furthermore, these costs are expected to rise as a result of continued population growth, concentrated infrastructure density and migration to vulnerable regions. While the current annual total economic cost of natural disasters is around \$6.3 billion, on average, it is expected that this annual cost will double by 2030 and reach \$23 billion in real terms by 2050, as illustrated in Chart A.2. These forecasts do not reflect any expected increase or shift in the currently observed level and severity of disasters that might be caused by climate change.

These rising costs have significant financial implications for all levels of government, regarding the cost of recovery, particularly through the Natural Disaster Relief and Recovery Arrangements. Using historical data, Deloitte Access Economics estimates that the Australian and state governments currently face average annual real costs of natural disasters of \$700 million per year, around 11% of total economic costs. It is estimated that 80% of government expenditure is outlaid by the Australian Government.

Based on this forecast of total economic costs, it is expected that governments will eventually face an annual cost of around \$2.3 billion in real terms, as illustrated in Chart A.3 on page 86.

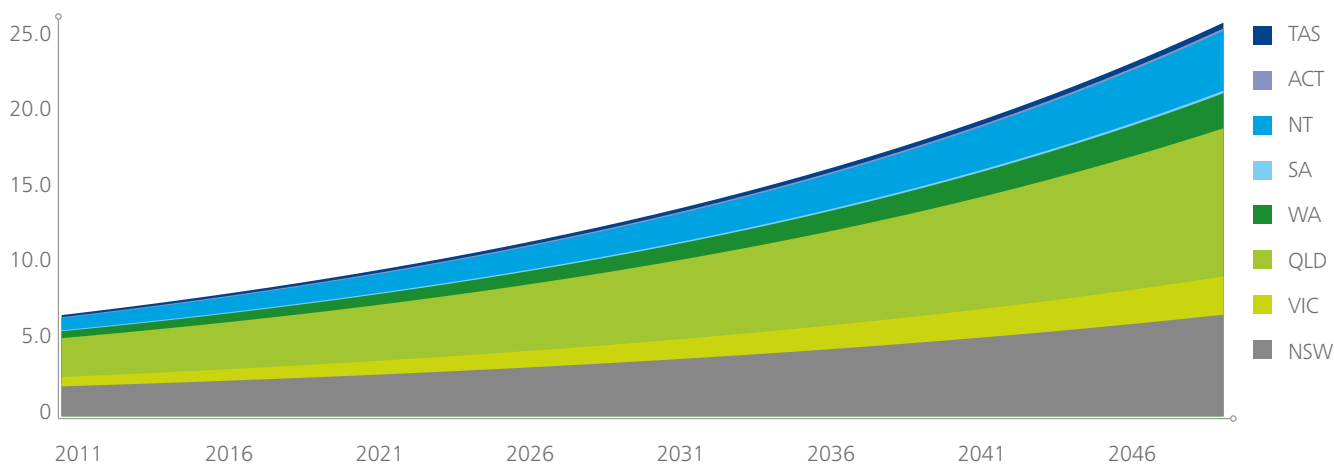
Overall, the expected future cost of natural disasters clearly highlights the need for governments to place a greater emphasis on improving Australia's resilience. Where pre-disaster investments are prioritised towards cost-effective resilience initiatives, substantial reductions in government expenditure on response initiatives can be achieved. This will rely on access to accurate, consistent data and on findings from targeted research programs, which provide essential evidence for determining the cost effectiveness of resilience options.

Adaptation and mitigation in Australia

Having quantified ongoing expenditure on natural disaster response efforts in Australia, the next component of the analysis reviewed the policy framework and allocation of roles and responsibilities in disaster management.

Chart A.2: Forecast total economic cost of natural disasters (\$bn), 2011 – 2050

\$bn (2011 prices)



Source: Deloitte Access Economics (2013)

The core Australian Government policy on natural disaster management is the National Strategy for Disaster Resilience (NSDR) (Council of Australian Governments (COAG), 2011). The strategy builds on the COAG agreement in 2009 to adopt a whole-of-nation approach to disaster resilience and management. Recognising the importance of co-ordination and cooperation between stakeholders, the NSDR clearly acknowledges the roles of businesses, community organisations and individuals, as well as government.

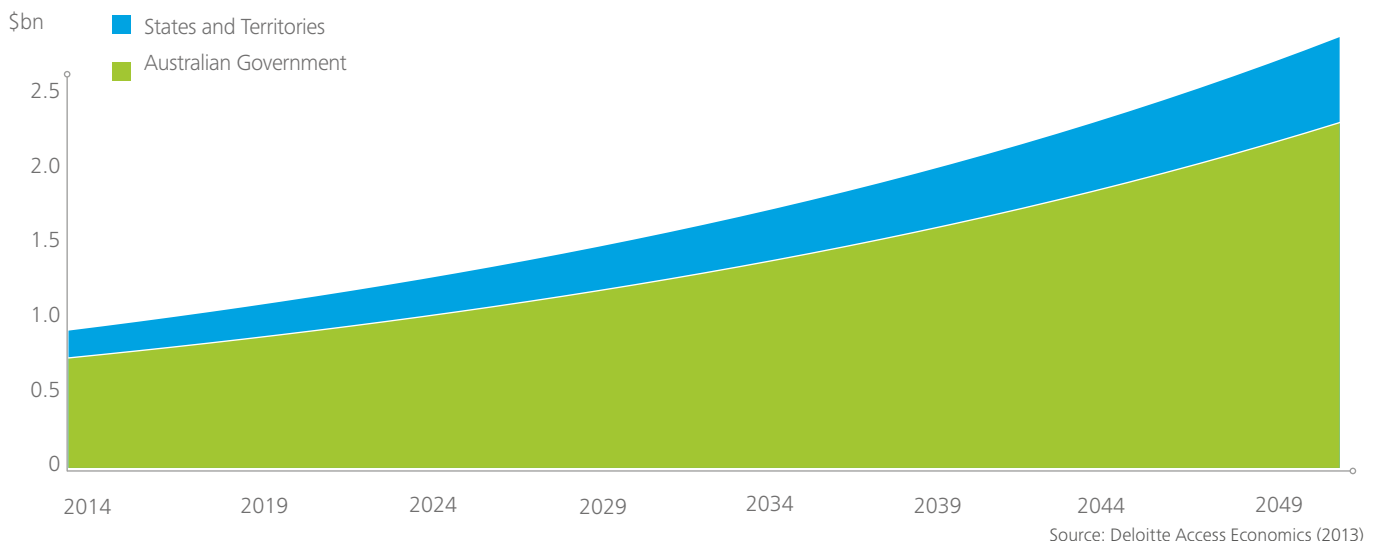
Similarly, the notion of shared responsibility for building resilience against natural disasters was recognised in a 'statement of common understanding' adopted by the COAG Select Council on Climate Change (SCCC) in 2012 (SCCC, 2012). The key roles and responsibilities from this document are outlined in Box A1 on page 87.

Notably, the document highlights the importance of best practice research as a foundation for decision-making, and the role of government in providing the best available risk information, in an accessible and useable way, in order to facilitate adaptation by the private sector.

Flowing from these roles and responsibilities, governments, businesses, communities and individuals are all involved in natural disaster adaptation and mitigation activities. Interactions between all levels of government take place through the COAG Responding to Disasters agenda, through the Standing Council on Policy and Emergency Management and the Australia New Zealand Emergency Management Committee. That said, there are also elements of pre-disaster resilience that reside within the remaining COAG reform agendas.

For example, the Critical Infrastructure Resilience Strategy, published in 2010, provides an example of how businesses, governments and communities have successfully worked together to reduce the exposure of Australian communities to risks posed by natural disasters. The strategy focuses on developing a process to improve resilience for physical facilities, supply chains, information technologies and communications networks, the loss of which would have significant impacts on the wellbeing of Australian communities (Australian Government – Attorney General's Department, 2010). This approach is targeting ways to improve resilience, allowing for greater operational sustainability and business continuity in the aftermath of future disasters. A comprehensive review of the effectiveness of the strategy is due in 2015.

Chart A.3: Forecast annual cost to governments of natural disasters (\$bn), 2011 - 2050



Box A1: Guiding principles for allocation of roles and responsibilities for climate change risk

The COAG Select Council on Climate Change 'statement of common understanding' highlights the need for different stakeholders to share responsibility for climate change risks. In particular:

- Building resilience should be assigned to those most appropriate to respond to local conditions. This will favour local initiatives and private responsibility where resilience has no external effects on third parties. That is, private parties will continue to take responsibility for their own actions, assets, investments and risks.
- Governments should respond to market failures and regulatory failures that prevent effective and efficient natural disaster risk management, focusing on:
 - Providing best available information about risks to facilitate adaptation by the private sector and making information accessible and useable
 - Ensuring that regulations, markets and institutions promote effective private risk management
 - Managing risks to public goods/assets and government service delivery
 - Taking account of disaster risk in policy and planning
 - Helping build capacity and resilience, where required, particularly to assist vulnerable individuals, groups, regions and communities.
- Decision-making should:
 - Be based on the best available research
 - Be cost-effective
 - Be regularly reviewed to meet changing circumstances
 - Enhance social inclusion.

Source: SCCC (2012)

The core responsibility for driving the implementation of the NSDR sits within the Attorney General's Department. Resilience activities are spread across a range of government departments and bodies, reflecting the importance of resilience within the broader policies. The activities of the Australian Government are supported by the states and territories, local governments, businesses, communities and individuals. Collectively, there is a great deal of valuable activity being undertaken in Australia to increase resilience against disasters.

However, there is a lack of co-ordination across these sectors, with the resilience agenda primarily resting within a traditional emergency management policy focus. Accordingly, the majority of funding for the management of natural disasters in Australia is concentrated on post-disaster relief and recovery activities, with much less allocated to pre-disaster resilience efforts. As described by the Productivity Commission:

"Broader emergency management arrangements may not be achieving the right balance between government expenditure on disaster prevention and expenditure on recovery. There appears to be an inadequate focus on preventing damages from natural disasters." (Productivity Commission, 2012:241)

This issue has now been made the focus of a new Productivity Commission Inquiry. The inquiry is examining the full scope of national expenditure on disasters, and the effectiveness of current mitigation support arrangements.

Deloitte Access Economics estimates that the Australian Government consistently spends around \$50 million per annum on pre-disaster resilience, and around \$560 million on relief and recovery – a 1:10 ratio. If no action is taken to reduce this disparity, this gap will widen as the costs of natural disasters increase.

This paper considers the opportunity for co-ordinating data provision and research to increase the efficiency of resilience investments, directing funds towards mitigation activities that will achieve the greatest returns. This will reduce the substantial costs associated with disaster relief and recovery, in terms of asset re-construction, the loss of human life and long-term physical and psychological trauma.

The case for resilience

In order to illustrate how investments in resilience could generate net benefits for Australian communities, indicative cost-benefit analyses for different types of resilience activities were undertaken through three case studies.

Overall, it was found that:

- A program focusing on building more resilient new houses in high cyclone-risk areas of South-East Queensland would reduce the risk of cyclone-related damage for these houses by around two thirds, and generate a benefit-cost ratio (BCR) of up to 3.0. Existing houses are particularly challenging to retrofit but the BCR of retrofits approaches 1.0 in high-risk areas.

- Raising the Warragamba Dam wall by 23 metres would reduce annualised average flood costs by around three quarters and generate a BCR of between 2.2 and 8.5. This would result in a reduction in the present value of flood costs between 2013 and 2050 from \$4.1 billion to \$1.1 billion, a saving of some \$3.0 billion.
- Building more resilient housing in high-risk bushfire areas generates a BCR of around 1.4; improved vegetation management results in a BCR of around 1.3; and undergrounding electricity wires results in a BCR of around 3.1.

These examples demonstrate that practical resilience measures, which target high-risk locations using appropriate combinations of infrastructure, policy and procedure, have the potential to generate economic benefits. Furthermore, the case studies highlight the importance of access to comprehensive information on disaster risk and the effectiveness of adaptation strategies as part of the cost-benefit analysis process. As noted in the report:

“A national strategy to improve resilience needs to find ways to better co-ordinate relevant data held by all parts of government and business so that decisions can be made on the best available information.” (2013:51)

Accordingly, the *Australian Business Roundtable for Disaster Resilience and Safer Communities* commissioned Deloitte Access Economics to prepare this report on natural data and research in Australia.



Brisbane River Flood Map, Queensland 2012