Frances Sullivan

This paper was submitted prior to the
November 14, 2016 Kaikoura earthquake.

Strategies for Managing Infrastructure Risk
an update

Dynamic is perhaps the most understated and least understood of all the terms used to describe New Zealand. Straddling an active plate boundary and surrounded by ocean, New Zealand has a spectacular and dynamic landscape formed by geological and meteorological events, but the management of the risk to people, property and infrastructure from natural hazard events associated with this environment is a challenging area of public sector management. Events of recent years, both here and overseas, present a timely reminder that risk does not stand still.

Our knowledge of hazards and our vulnerability to events are both on the rise, and local government has recognised the need to stand back and take stock of whether we are doing the best we can to manage risk rationally and sustainably (Willis, 2014).

The Canterbury earthquakes of 2010 and 2011 created a heightened awareness of the impacts of earthquakes, including access to insurance (Stobo, 2015), and global agreements to commit to mitigating climate change impacts are now being embedded in the policy environment. Central government agencies are responding: the National Infrastructure Unit infrastructure plan, the Ministry of Civil Defence and Emergency Management resilience strategy, the classification of earthquake-prone buildings and the parliamentary commissioner for the environment's report on sea level rise. Treasury has embedded risk management as one of five key factors for policymakers to consider to achieve the vision of higher living standards for New Zealanders (see figure). As our wealth and standard of living has grown, so has our risk. Risk management enables policymakers to be better informed about the risks associated with action or inaction, to analyse critical information for prioritisation and resource allocation processes, and to target desired levels of resilience. Good risk management is the difference between evidence and knowledge, and intuition and luck.

Risk is defined by ISO 31000 as the 'effect of uncertainty on objectives', and while science continues to improve our understanding of the likelihood of natural hazard events, the consequences are not so well understood. The immediate impacts of these events are readily identifiable, if not quantifiable – lives lost or damage done to property – but much more difficult to assess is the impact on the economy, community health and well-being.

The uncertainty of when an event will occur, whether it be coastal erosion or an earthquake, and the impacts of these events does not measure up well against the perception of the immediate impact on property rights. This is often the greatest barrier to action. Local government has seen this time and again in the dialogue on actions to

Frances Sullivan is a Principal Policy Advisor with Local Government New Zealand.

address the threat of these natural hazards on our lives. Downward pressure on rates, coupled with increasing expectations of service delivery, have the potential to delay decision making and create gaps in investment that cannot be avoided in the long term, although it is not clear who will pay and when. These are issues that are being grappled with internationally.

Local Government New Zealand has developed a business case for a local government risk agency for government consideration. The initial focus of the proposed risk agency will be to close the information and capability gap in relation to local government assets (and associated services) and natural hazard risks. Local authorities want to take a more integrated and informed approach to risk-based decision making because these assets (three waters infrastructure (water supply, waste water and storm water) in particular) tend to be expensive (and ageing) and difficult to maintain, and are of critical importance to the local economy and community welfare. This would include the use of risk-based approaches for asset management and developing a better understanding of the risk/return trade-offs. The benefits expected from the proposed changes are:

- greater community resilience and welfare as a result of better risk management and governance; and
- improved national and local visibility (greater sharing and understanding) and cost certainty of risk exposure.

Benefits will also accrue to

- the Crown by way of its reduced contingent liability;
- communities by way of improved resilience and welfare; and
- local government by way of insurance premiums that are better value for money.

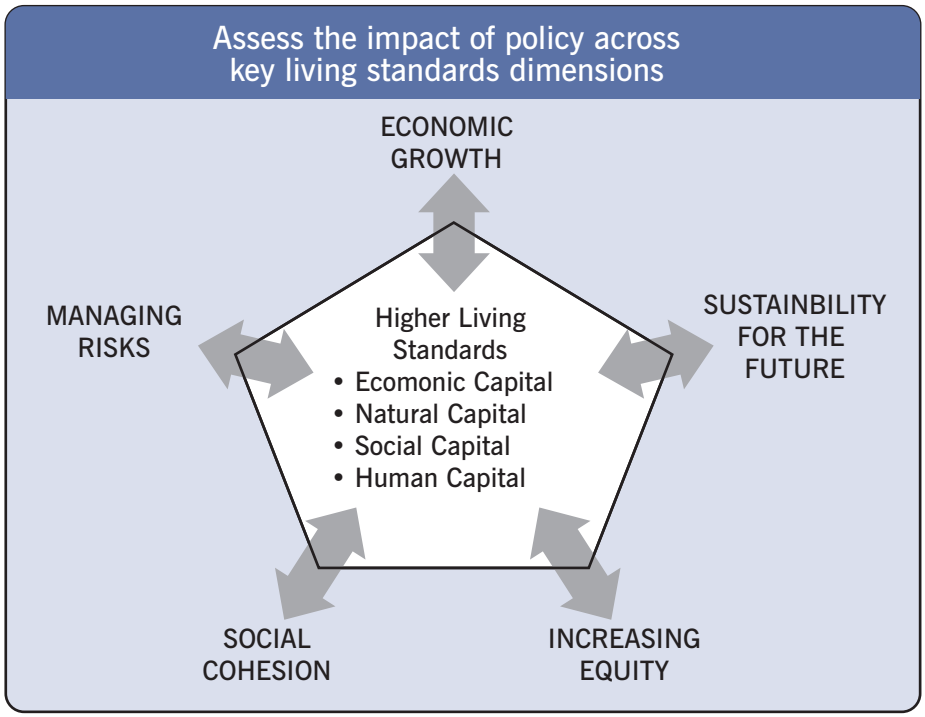
This work follows the Local Government New Zealand think piece on managing natural hazard risk (Willis, 2014) and insurance market review (Stobo, 2015). The think piece made three recommendations: for a national information portal; a policy platform: and a natural hazards and community resilience strategy. It also identified two core ideas that dominate natural hazard risk management:

- the need for issue- and place-specific responses; and
- the need for integration and collaboration in order to develop and deliver effective responses across the many players with a role to play.

Integration and collaboration are easier to require than they are to deliver, however. Don Lenihan describes the policy process as 'designed for a simpler world, where governments were busy building roads and bridges, regulating basic trade and commerce, and establishing law and order', and proposes five principles for rethinking the policy process, with a strong underlying theme of collaboration and integration:

1. Good policy is comprehensive: good planning and policy development should be comprehensive, in the sense that it should take important links to other policy fields into account.
2. Real progress requires public participation: societal goals are bigger than government in the sense that their achievement requires effort and action on the part of all. Climate change mitigation and health are both good examples. It takes more than good public transport and cycle paths to reduce reliance on private transport; it requires an informed and engaged public who are ready, willing and able to change their behaviours.
3. Societal goals require long-term planning: societal goals like wellness or climate change adaptation are long-term goals that require ongoing dialogue, action and adjustment. No single piece of legislation or strategy will achieve them; nor will they be achieved in the usual three-year mandate of a government.
4. Every community is different: issues that look similar at first glance are often very different just below the

> Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development. Increasing magnitudes of warming increase the likelihood of severe, pervasive and irreversible impacts for people, species and ecosystems. Continued high emissions would lead to mostly negative impacts for biodiversity, ecosystem services and economic development and amplify risks for livelihoods and for food and human security.
>
> — IPCC fifth assessment report



> Coastal defenses reduce the risk of floods today, but they also attract population and assets in protected areas and thus put them at risk in case the defense fails, or if an event overwhelms it.
>
> —Stephane Hallegate, senior economist, World Bank

surface, as, therefore, are the causes of and solutions to the problem. While this does not mean there is nothing useful to say at a regional or national level, it does mean that good policy making must allow for real flexibility in solutions and implementation at a variety of levels.

5. The public have new expectations: public expectations around transparency and accountability have changed. (Lenihan, 2012, pp.39-41)

Underpinning integration and collaboration, the application of these principles within local government is growing. The provision of natural hazard information to the public is taking on new dimensions, with Otago and Hawke's Bay recently setting up websites. The East Coast LAB (Life at the Boundary) is a collaboration between GNS Science, EQC, Massey University, NIWA, the Ministry of Civil Defence and Emergency Management, regional councils and the civil defence and emergency management groups from Hawke's Bay, Manawatu–Whanganui, Wellington and Napier. Given this region's proximity to the Hikurangi trench, the aim is to ensure that people living on the east coast of the North Island are aware of the hazards that affect them and know how to prepare and respond to natural hazard events.

Reinforcing the principle that every community is different, natural hazards caused by climate change are, by contrast, the long-term priority for Otago. The parliamentary commissioner for the environment has described sea level rise impacts on South Dunedin as 'a slow unfolding red zone'. The Otago Regional Council has recently released three videos, on the history of the landscape, the relationship between groundwater and land levels, and sea level rise and other risks, as the starting point for discussions about the future of South Dunedin and how the community responds and adapts to climate change.

Following the ACTA (avoid, control, transfer and accept) approach, most local authorities have some planning provisions that reflect climate-related risk based on current predictions (Lawrence et al., 2013). In a study of 99 local authority plans, Wendy Saunders of GNS Science found that a set of general risk management and/or 'all hazard' objectives and policies, alongside hazard-specific methods and rules, is a common approach in district plans, and that managing risk is becoming more explicit in regional policy statements and district plans (Saunders and Grace, 2015).

Conclusion

Consideration is needed about the choices that exist for addressing future risk and who will bear the costs. A World Bank report forecasts average global flood losses to multiply from $US6 billion per year in 2005 to $US52 billion in 2050 through increasing population and property value alone (Hallegatte et al., 2013). The risks from sea level rise and sinking land mean that large coastal cities could face losses costing $US1 trillion a year if these cities do not take steps to adapt, and while New Zealand cities do not feature in the list of those at risk, local authorities well remember the influence the Canterbury earthquakes had on the cost of insurance for infrastructure assets.

A risk management approach will enable local authorities to address priority issues with their communities. Infrastructure that provides core services to communities could be the first to be affected by rising sea levels and storm surges, rainfall events of greater frequency and intensity, and other natural hazard events. Despite this, there remains the potential for risk management to be viewed as part of the merry-go-round of favoured policy themes that come and go depending on the political leanings of the time. Yet, in light of increasing demands on budgets, and increasing demands on and expectations of services for both central and local government, risk management at its simplest supports prudent financial management and decision making in a constrained fiscal environment.

References

Hallegatte, S., C. Green, R.J. Nicholls and J. Corfee-Morlot (2013) 'Future flood losses in major coastal cities', *Nature Climate Change*, 3, pp.802-6

Lawrence, J. F. Sullivan, A. Lash, G. Ide, C. Cameron and L. McGlinchey (2013) 'Adapting to changing climate risk by local government in New Zealand: institutional practice barriers and enablers', *International Journal of Justice and Sustainability*, 20 (3), pp.298-320

Lenihan, D. (2012) *Rescuing Policy: the case for public engagement*, Ottawa: Public Policy Forum

Saunders, W. and E. Grace (2015) 'A case study of best practice natural hazard planning provisions in New Zealand', paper presented at the Roger Davis Research Symposium, Auckland

Stobo, C. (2015) *Local Government Insurance Market Review*, Wellington: Local Government New Zealand

Willis, G. (2014) *Managing Natural Hazard Risk in New Zealand: towards more resilient communities*, Wellington: Local Government New Zealand