

Building community resilience

Report prepared for NZ Society of
Local Government Managers
(SOLGM)
by Dr Roger Blakeley

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**New Zealand Society of
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Executive Summary

This work was commissioned by the New Zealand Society of Local Government Managers (SOLGM). The purpose is to present building community resilience as a key consideration for local authorities as they undertake their day-to-day work, and to introduce the key concepts of resilience thinking to managers and staff in local authorities.

A working definition of 'resilience' has been proposed as 'what enables people to survive, adapt and thrive in the face of shocks and chronic stresses'. 'Shocks' include storms, floods, droughts, earthquakes or volcanoes. 'Chronic stresses' encompass economic downturns which impact on the survival of businesses and employment; long-term demographic change such as declining population and limited rating base; and climate change impacts of sea level rise and greater frequency of storms and droughts. To illustrate the importance of resilience, the New Zealand Insurance Council expects natural disasters in any one year to cost around 1% of GDP or \$1.6 billion. The years 2013, 2014 and 2015 have been among the most expensive years ever for weather-related events.

The report sets out the key concepts and underpinnings of resilience. It relates inspiring stories from the Canterbury earthquakes recovery, Wellington, New York and New Orleans, that demonstrate resilience. It distinguishes between 'resilience', 'preparedness' and 'recovery'. It describes the work being done by Ministry of Civil Defence Emergency Management on the *National Disaster Resilience Strategy* review.

Finally, it discusses the role of local authorities in helping build community resilience, working in collaboration with government, business, communities, iwi, civil society, the social sector, science and research institutes. It recommends for discussion a framework for the role of local authorities in resilience of neighbourhoods, communities, districts/cities/regions, and the resilience of the nation. It proposes that all local authorities in New Zealand become champions of resilience, and take actions to manage risks and empower communities. The benefits of such leadership will be the safety and wellbeing of communities, and saving money in future Long-term Plans. Investment decisions now can avoid or mitigate major future costs of short-sighted infrastructure or land-use decisions, or the considerable costs of recovery from shock events.

The report acknowledges the work by Local Government New Zealand (LGNZ) on establishing the Local Government Risk Management Agency (LGRA) and recommends that SOLGM and LGNZ discuss how to ensure this work on Resilience and the work on the LGRA are seamlessly integrated and mutually reinforcing.

1. Introduction

In commissioning this report, SOLGM noted that international literature around urban and community development is increasingly moving to seeing communities as open systems, with a focus on the notion of the resilient community. Resilience focuses on the ability of communities to adapt to stresses and shocks, and is therefore a much wider concept than the traditional focus on preparedness and recovery.

SOLGM's Sector Futures Working Party (SWP) has identified the wider definition of resilience as a 'coming issue' for New Zealand. It reached this judgement after: discussions with those local authorities involved in the Rockefeller Foundation's global *100 Resilient Cities* programme (Christchurch and Wellington); recognising work being undertaken in central government towards a *National Disaster Resilience Strategy*; and considering lessons on recovery from the Canterbury earthquakes.

SOLGM wishes to present resilience as a key consideration for local authorities as they undertake their day-to-day work, and to introduce the concept of 'resilience thinking' to managers and staff in local authorities.

The purpose of the report is to:

- propose a working definition of resilience (which may be adapted from or directly use a definition or definitions from external sources)
- set out the key concepts and underpinnings of resilience
- distinguish between resilience, preparedness and recovery
- discuss the role of local authorities in helping build community resilience
- set the scene for future SOLGM work (including any recommendations as to further work that SOLGM should undertake)

This project has involved: an international literature search on community resilience; meetings in Christchurch with a wide range of people and organisations involved in the response and recovery following the Canterbury earthquakes; meetings with the Chief Resilience Officers for Christchurch and Wellington, appointed as part of The Rockefeller Foundation's global *100 Resilient Cities* programme; discussion with leaders of Civil Defence Emergency Management (CDEM) in Christchurch, Auckland and Wellington; discussion with government officials in the Ministry of Civil Defence Emergency Management (MCDEM), the Department of Prime Minister and Cabinet's Canterbury Earthquake Recovery Learning and Legacy Programme, and the National Infrastructure Unit in Treasury; discussion with LGNZ about the work on establishing a Local Government Risk Management Agency and how the SOLGM work on resilience relates to that; and a webinar on 5 April 2016 involving officers from 15 councils, including many smaller districts around New Zealand. This report completes the brief for the project. There are recommendations at the end of this report on follow-up action for SOLGM's consideration.

2. Working definition of resilience

The word 'resilience' is used in a variety of contexts, with subtle differences in meaning. The best definitions of 'resilience' and 'community resilience' include:

Resilience is the capacity of any entity – an individual, a community, an organisation, or a natural system - to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience¹.

Dr Judith Rodin, President, The Rockefeller Foundation

More succinctly:

Resilience is what enables people to survive, adapt and thrive in the face of shocks and chronic stresses².

100 Resilient Cities

A definition of 'community resilience', which has similar themes to the above, is given by the Wellington Region Emergency Management Office:

Community resilience is the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change³.

A definition of 'resilience' from the National Infrastructure Plan, 2011 is:

The concept of resilience is wider than natural disasters and covers the capacity of public, private and civic sectors to withstand disruption, absorb disturbance, act effectively in a crisis, adapt to changing conditions, including climate change, and grow over time⁴.

¹ Rodin, Judith (2015) *The Resilience Dividend: Being Strong in a World Where Things Go Wrong*, amazon.com, Barnes & Noble Booksellers, <http://resiliencedividend.org/>

² Rockefeller Foundation, *100 Resilient Cities*, <https://www.rockefellerfoundation.org/our-work/initiatives/100-resilient-cities/>

³ Wellington Region Emergency Management Office (2014) *Community Resilience Strategy, Second Edition, Building Capacity – Increasing Connectedness – Fostering Cooperation*, September.

⁴ National Infrastructure Unit (2011) *National Infrastructure Plan 2011*, Wellington: National Infrastructure Unit, The Treasury, www.infrastructure.govt.nz/plan/2011/nip-jul11.pdf

In discussions leading to this report, the author observed that people resonate strongly with the *100 Resilient Cities* definition above, for its succinctness and clarity, and that is recommended as the working definition.

3. Key Concepts and underpinnings of resilience

Concept of resilience and roots of resilience thinking

The Rockefeller Foundation document *100 Resilient Cities* expands on the concept of resilience:

Therefore, building resilience is about making people, communities, and systems better prepared to withstand catastrophic events – both natural and man-made – and more able to bounce back quickly and stronger. Humans are not born with resilience - we learn it, adapt it, and improve upon it. The same is true for organisations, systems, and societies.

The roots of resilience thinking are in the disciplines of ecology, engineering, and psychology, systems theory and the concept of 'adaptive capacity'.

Ecology

Carl Folke is a leading thinker in this discipline. He traced the roots of resilience thinking to the ecological literature of the 1960s and 1970s, including research by CS Hollings, a Canadian ecologist, about how populations of predators and prey maintained their functions and relationships in the face of sudden shocks and disturbances across time and space⁵. Another example is how forests, as a natural system, are constantly disrupted: by fire, drought, disease or development. However, forests can survive disruptions. They may over time 'return' to a functioning ecosystem similar to that previously, or 'transform' to a new system. Resilience is *not* about *not* changing. Forests change as they develop, with or without a significant disturbance or disruptive event.

Engineering

The second discipline that has contributed a great deal to resilience thinking is engineering; for example, networked infrastructure, reliability theory and redundancy, materials technology, shock absorption, ductility and controlled collapse. New Zealand has been a world leader in developing an earthquake design philosophy called 'capacity design'. It had its roots in 'fail safe' strategies in the aircraft industry. The idea was that a building would be designed so that under very severe earthquake shaking, major damage would occur in the beams, but not the columns - the columns are critical if the building is to remain standing. All those inside could then escape alive, even if the

⁵ Folke, C. (2006) *Resilience: The emergence of a perspective for social-ecological systems analyses*, Global Environmental Change, Vol 16, 253-267.

building was not repairable.

The author served on a New Zealand Standards Committee, comprising six members who wrote the New Zealand Code for Reinforced Concrete Buildings, 1976. Since that date every major concrete building in New Zealand has been designed according to that code. The code is based on the resilience philosophy of 'capacity design'.

The shaking in the Canterbury Earthquake of 22 February 2011 was extremely severe: twice the acceleration of gravity both horizontally and vertically. This far exceeded the earthquake code loadings. There were two major building collapses with tragic loss of life: the Pyne Gould building, which was designed before the 1976 code, and the CTV building, which was designed after the 1976 code, but was subject to human failings in design and construction, which have since been well documented. Many of the large buildings had to be demolished, but they had passed the ultimate 'resilience' test under 'capacity design', of remaining standing to allow the occupants to escape alive. The code had worked.

Psychology

The third discipline that has contributed to resilience thinking is psychology. There has been a paradigm shift in the discipline over the past two decades, away from its long-term concentration on 'dysfunction and pathology' (mental illness), and toward its more recent focus on 'resilience and health'. The recognition that some people and groups adapt better to the loss and destruction associated with disaster has stimulated the desire to develop this resilient capability. Douglas Paton, School of Psychology, University of Tasmania, undertook a study in 2005 for the Auckland Region Civil Defence Emergency Management Group, as part of a programme of work aimed at defining, understanding and measuring community resilience. He developed an evidence-based model, shown in Figure 1, that allows emergency planners to identify the personal, community and institutional factors that predict resilience⁶.

⁶ Paton, D. (2007) *Measuring and monitoring resilience in Auckland*, GNS Science Report, 2007/08, 88p.

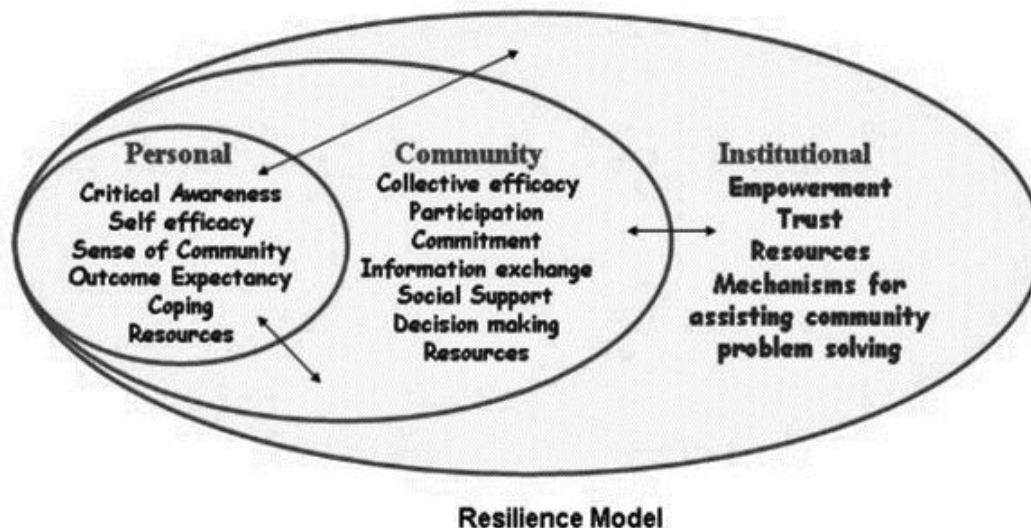


Figure 1. Resilience Model, after Paton⁶

This model could be applied to understanding the connection between people knowing about their hazards and risks, but few taking effective action to mitigate or manage them. For example, there were many people in Christchurch who had experienced the September 2010 earthquake, but failed to be any more prepared for the February 2011 earthquake. It has been said that emergency management and resilience is as much about psychology as it is about geology.

Indigenous knowledge, impacts on Māori of ōtautahi/Christchurch earthquakes

David Johnston, Director/Professor of Disaster Management, School of Psychology, Massey University⁷, led a project about resilient communities in New Zealand, across the continuum of hazard mitigation, preparedness, response and recovery – with a particular focus on indigenous knowledge. Building on research from the Canterbury earthquakes, the Rena oil spill, responses to economic shocks, and recovery from natural climatic events such as droughts and floods, the research has investigated post-disaster/shock community resilience in an urban area (Christchurch City), a secondary urban area (Kaiapoi), a mostly rural community (central Hawkes Bay) and a small, predominantly Māori community (Murupara). Research partnerships with these communities highlighted perspectives such as dependence of the individual on the whole, social connectedness (whakapapa and whanaungatanga), and responsibilities for guardianship of the environment (kaitiakitanga). The resilience model of Douglas Paton in Figure 1 was used, and proposed measures for facilitating and evaluating community resilience were developed.

⁷ Johnston, D. (2015) *Understanding Factors that Build Resilience in New Zealand*, Completed Projects, Report for MBIE, Director/Professor of Disaster Management, School of Psychology, Massey University, https://www.google.co.nz/?client=safari#q=David+Johnston+NZ&gfe_rd=cr

Simon Lambert of Lincoln University has researched the impacts on Māori of the Ōtautahi/Christchurch earthquakes. Neighbourhoods with significant Māori populations are generally younger and poorer compared to the rest of the population. The eastern and coastal suburbs, Kaiapoi and Lyttelton, have significant Māori communities and were severely impacted by the earthquakes with many homes and streets affected by liquefaction:

The series of earthquakes experienced by residents of Christchurch have radically altered the physical and social landscapes of the city. Throughout the disaster, Māori institutions naturally and automatically helped non-Māori, underpinned by the cultural practices of manaakitanga and whanaungatanga. This manifestation of Māori cultural resilience enabled a considerable network of people and resources being available to Māori through whānau, marae and kura.

While resilience has become a commonplace term within the city, our results show the Māori experience thus far is best described as endurance: the 'bounce back' in people's well-being that this report interprets as resilience has yet to happen across Māori communities. This should not be a surprising conclusion at this stage of a recovery process that will take many years to complete.

Overall, Māori are remarkably philosophical about the effects of the disaster with many proudly working in their roles through a historic event of great significance to the city and country. Most believe that 'being Māori' has helped cope with the disaster although for some this draws on a collective history of poverty and marginalisation, features that undoubtedly contribute to the vulnerability of Māori to such events. Reducing our future vulnerability will require the collective continuance of our cultural practices and an increase in Māori economic wellbeing⁸.

Consideration of resilience by local government should look at the impact of this disaster on iwi/Māori and discuss the related implications under Te Tiriti o Waitangi.

⁸ Lambert, S. (2013) *Impacts on Māori of the Ōtautahi/Christchurch earthquakes*, Working Paper 2013-01, Te Whanake, Faculty of Environment, Science and Design, Lincoln University, https://researcharchive.lincoln.ac.nz/bitstream/handle/10182/5641/Lambert_Maori-Resilience_2013.pdf?

Systems thinking

All of the disciplines discussed, which together form the core of the concept of resilience, draw on systems thinking. A system is defined as a set of interrelated elements that interact with each other within some defined boundary, and which are organized to perform a function or to follow some purpose. The human body is a system, as is a forest, a community, a computer network, a company, a city, and a society.

The 'Feedback Loop' is an essential element of systems and of resilience thinking. Systems are self-regulating, meaning the elements behave and interact in such a way as to continue functioning to achieve the system's purpose, and for this the system relies on feedback loops. A simple example is that if people warm their hands in front of a fire, a feedback loop will tell them to pull back if they are about to get burnt. But in complex systems, such as a city or a community or an organisation, the cause and effect may not be closely related in time or space, and as a result people may be treating symptoms and not causes. Judith Rodin gives this example:

This is why, for so many years, the city of Medellin could not break out of its cycle of violence and poverty. It attempted to treat the symptoms, by shooting or arresting (or too often colluding with) drug dealers and street criminals, without addressing neighbourhood cohesion, transportation, education, access to basic needs, and other elements of the city system⁹.

Adaptive Capacity

The Canadian ecologist CS Holling argues that there are two different ways of looking at natural systems - as either 'stable' or 'resilient'. He says "stability represents the ability of a system to return to an equilibrium state after a temporary disturbance". He goes on to say there is a second view of systems and that concerns "another property, termed resilience, that is a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables"¹⁰.

The 'Adaptive Cycle' is often depicted as a loop with four phases: rapid growth, conservation, a 'release' of some kind – which can be caused by a disruption on the reaching of some threshold – followed by a period of reorganisation. 'Adaptive Capacity' is the capacity of a system to absorb change and disruption from external forces, and adapt or change in response.

⁹ Rodin, Judith (2015) *The Resilience Dividend, Managing disruption, avoiding disaster, and growing stronger in an unpredictable world*, Profile Books Ltd, London, The Rockefeller Foundation, 2015.

¹⁰ Holling, C. (1973) *Resilience and Stability of Ecological Systems*, Annual Review of Ecology and Systematics 4: 1-23, <http://www.jstor.org/stable/2096802>

An example of the adaptive cycle is what happens in a forest. Trees grow rapidly at first, they get bigger, more trees grow, and the forest expands. Gradually, as the trees mature and certain species come to dominate and crowd out new growth, the expansion of the forest slows. Then there may come some kind of release: perhaps a forest fire, logging if the forest is not protected, or a major storm, or disease which fells a large number of trees. The disruption may be a threat to the stability of the forest, or it may be a source of new energy and revitalization. If the forest can adapt, change character, continue to function, and still grow – even if with different species and character – it shows resilience.

The concept that systems are dynamic, never static or stable for long, and that disruptions are an essential 'natural' part of the never-ending cycle of adaptation and change, is fundamental to resilience thinking.

Another example is a phrase coined by the economist Joseph Schumpeter, 'creative destruction', which refers to the resilience of an industry or economy and the entities within it. In business, a company typically starts small, grows fast, expands, and begins to consolidate its success. A small competitor creates a rival product, service, technology or business model that disrupts the industry - as Amazon's online retailing did with traditional booksellers, Netflix is doing with movie distribution, Uber is doing with taxi services and smartphones have done to change our lives.

A related concept is that of 'thresholds' or 'tipping points'. A threshold is reached when a chronic stress, such as global climate change, reaches a point where it becomes an acute event that results in an emergency which compels us to take extraordinary action and, eventually, rethink our vulnerabilities. Another example is when the global financial services firm Lehman Brothers collapsed in September 2008 after a long period of stress on the US financial system, it started financial panic that triggered the Global Financial Crisis. Even the Canterbury earthquakes occurred after a long period of stress in the earth's tectonic plates under New Zealand, and reached a tipping point with the sudden release of huge energy caused by slippage along fault lines.

Three global phenomena of the 21st century - rapid urbanization, climate change and globalization - are intertwined in a social-ecological-economic nexus. Humankind will be at risk if we lose sight of the complex signals of a degrading planet, pushed to the limits of its capacity to support our growth. That is why resilience thinking is so important at both global and local levels.

Social Capital

The concept of social capital has been popularized, in particular, by Harvard's Professor Robert D Putnam, who conducted a quasi-experimental study of subnational governments in different regions of Italy¹¹. He found that although all these regional governments seemed identical on paper, their levels of effectiveness varied dramatically.

¹¹ Putnam, R (1993) *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton: Princeton University Press

Systematic inquiry showed that the quality of governance was determined by longstanding traditions of civic engagement (or by their absence). Voter turnout, newspaper readership, membership in choral societies and football clubs - these were the hallmarks of a successful region. In fact, historical analysis suggested that these networks of organized reciprocity and civic solidarity, far from being a secondary effect of socioeconomic modernization, were a precondition for it:

No doubt the mechanisms through which civic engagement and social connectedness produce such results - better schools, faster economic development, lower crime, and more effective government - are multiple and complex. While these briefly recounted findings require further confirmation and perhaps qualification, the parallels across hundreds of empirical studies in a dozen disparate disciplines and subfields are striking. Social scientists in several fields have recently suggested a common framework for understanding these phenomena, a framework that rests on the concept of *social capital*. By analogy with notions of physical capital and human capital - tools and training that enhance individual productivity - "social capital" refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit.

Prime Minister Jim Bolger delivered a series of four speeches in 1997 on the theme of 'social capital'. Here are some excerpts:

It is now recognized that Big Government didn't work in the economic field and my argument is that by itself it can't deliver in the social field either, and that we need a partnership between Government and the community to start rebuilding the 'social capital' of the nation...

Four characteristics are found in communities that manifest civic trust: a sense of belonging, social cohesion, family support systems, and the nurturing of individual potential.

As one academic said of a number of strong communities he studied: "they were not civic because they were rich - far from it - they were rich because they were civic"¹²

Daniel Aldrich has studied building resilience and the critical role of social capital in post-disaster recovery. The abstract of his book¹³ states:

Building Resilience highlights the critical role of social capital in the ability of a community to withstand disaster and rebuild both the infrastructure and the ties that are at the foundation of any community. Aldrich examines the post-disaster responses of four distinct communities—Tokyo following the 1923 earthquake, Kobe after the 1995 earthquake, Tamil Nadu after the 2004 Indian Ocean tsunami, and New Orleans post-Katrina—and finds that those with robust social networks were better able to coordinate recovery. In addition to quickly disseminating information and financial and physical assistance, communities with an abundance of social capital were able to minimize the migration of people and valuable resources out of the area.

¹² Bolger, J (1997) *Together Communities*, Prime Minister's speech in Palmerston North on 17 May, 1997

¹³ Aldrich, D. (2012) *Building Resilience: Social Capital in Post-Disaster Recovery*, The University of Chicago Press books, ISBN:9780226012896, August, <http://www.press.uchicago.edu/ucp/books/book/chicago/B/bo13601684.html>

Resilient Organisations stressed the need for a multi-capital model with both physical capital, such as infrastructure, and social capital. Mary Richardson, GM, Customer and Community, Christchurch City Council said that policies that build trust, civic engagement and equity will build strong social capital that will create resilience in the face of shocks. Karen Banwell's PhD thesis is examining why some communities responded well to the earthquakes, and others did not. Urban form, such as compact cities and cul-de-sac street layouts, creates better social connectedness and greater resilience, which has important implications for the way we design our cities, towns and communities. Several others also stressed the importance of social capital.

Sustainable development

Risk management and resilience is an integral part of a sustainable development approach to cities and regions. (This is illustrated in Figure 5, page 27). Dorothy Wilson commented for this report:

The importance of resilience is coming into sharper focus in an age of increasing national and global uncertainties and unpredicted events. Whereas sustainability keeps an holistic short- and long-term focus on the relationship between people's needs and the earth's capacity to sustain itself, resilience concentrates on how to most effectively deal with change. As such, resilience has many of the same tenets as sustainable development. It reflects the Principles of the Agenda for the 21st Century (Agenda 21) agreed at the Rio Conference in 1992, which talked about building community understanding of the challenges facing the world, developing ownership of them and being involved in formulating solutions. This reinforces the importance of having strong, connected, involved communities and NGOs, and healthy relationships and partnerships with councils and governments.

Risk management could therefore be seen as the underpinning of resilience, focused on policies, plans and practical steps to deal with disasters of any sort, often led at a local authority/government level, but fundamentally dependent on the existence of strong resilient communities and businesses which are actively enabled to be involved in their formulation.

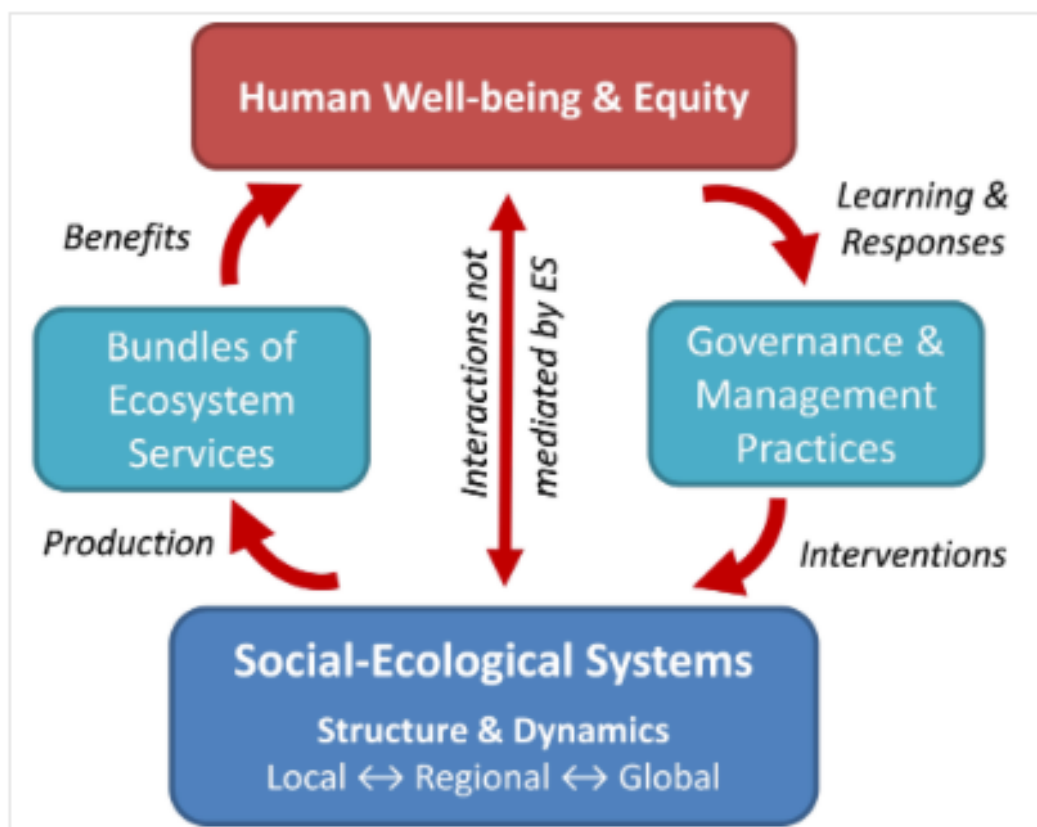


Figure 2 Ecosystems and Well-being, after SAPECS¹⁵

Chrissie Williams gave a presentation on the 'The importance of the natural environment to health and well-being in a disaster' in February 2016¹⁴. It included the diagram in Figure 2 from SAPECS (2016)¹⁵, which shows the cycle of human well-being and equity, governance and management practices, social-ecological services and bundles of ecosystem services. Chrissie Williams made the point that nature's ecosystem services contribute to the well-being of New Zealanders in a disaster. Disaster risk is the product of hazard (such as earthquake, liquefaction, landslides, flooding) and vulnerability (such as development near the coast, waterways and on the Port Hills), centralized infrastructure, limited readiness and low local social capital. Resilience is enhanced by reduced vulnerability and reduced exposure to the hazard.

¹⁴ Williams, C. (2016) *The importance of the natural environment to health and well-being in a disaster*, presentation to People in Disasters Conference, Environment Canterbury Regional Council, 26 February.

¹⁵ SAPECS (2016) *South African Program on Ecosystem Change and Society*, case study of the international Program on Ecosystem Change and Society, <https://www.sapecs.org/about/>

Public health, equity, psychosocial recovery

The responsibility for psychosocial recovery from the Canterbury earthquakes has been passed from the Canterbury Earthquake Recovery Authority (CERA) to the Canterbury District Health Board and Ministry of Health. The principles of the psychosocial recovery process include:

- Most people will recover from an emergency event with time and basic support.
- Support in an emergency event should be geared toward meeting basic needs.
- A continuum from self-help to more intensive forms of support should be provided, within a clear referral and assessment framework.
- Those at high risk in an emergency event can be identified and offered follow-up services provided by trained and approved community-level providers.
- Co-operative relationships across agencies, sound planning and agreement on psychosocial response and recovery functions are vital¹⁶.

Psychosocial effects can go on for many months and years after the event that caused the trauma. Canterbury was subject not only to a single event, but also to thousands of aftershocks. People were subject to additional stresses such as ongoing insurance claims.

Susan Bidwell and Rebecca Dell set out factors that can affect people's wellbeing in recovery after a disaster, from a public health perspective. They included:

- Equity: those with financial resources generally recover faster from disasters than those without. Rebuilding offers opportunities to create a more equitable community but needs careful planning and oversight or the less well-off may be further disadvantaged
- Housing: communities that are displaced suffer more adverse effects and take longer to recover, particularly if they are separated from their social networks or relocated far from their original areas.
- Social cohesion and community resilience: most people derive their major support in a disaster and its aftermath from relatives and friends. Those who lack these support networks are likely to be particularly vulnerable¹⁷.

Professor Regan Potangaroa presented a paper on the experience of Māori and Polynesians in the eastern suburbs of Christchurch following the February 2011 earthquakes:

The eastern suburbs of Christchurch are where a large proportion of Māori and polynesians reside and it is also one of the areas that was most affected by the February 2011 earthquake... The surveys were completed in the last week of April and the first week of May 2011. They suggest that the impact of the earthquake for those at the 'bottom of the

¹⁶ Ministry of Health (2007) *Planning for Individual and Community Recovery in an Emergency Event, Principles for Psychosocial Support*, National Health Emergency Plan.

¹⁷ Bidwell, S., R Dell (2011) *Long-term planning for recovery after disasters: Ensuring health in all policies*, A paper prepared by Community and Public Health Information and Analysis, Canterbury District Health Board, June, <http://www.cph.co.nz?Files/LTPRecovery-HIAP-fulldocument.pdf>

pyramid' was greater than other disasters measured overseas and that Helen Clark's comparison to Haiti may have been more accurate than she imagined, despite the huge difference in death toll (Christchurch 185, Haiti 250,000). The paper outlines how disasters touch the poor, the most marginalised, including women and girls. It is these people who suffer the greatest impact¹⁸.

4. Principles of Resilience

The Rockefeller Foundation, in its *100 Resilient Cities* document, identifies seven qualities that allow resilient cities to withstand, respond to and adapt more readily to shocks and stresses. They are:

- * Reflective: using past experience to inform future decisions
- * Resourceful: recognising alternative ways to use resources
- * Robust: well-conceived, constructed and managed systems
- * Redundant: spare capacity purposively created to accommodate disruption
- * Flexible: willingness and ability to adopt alternative strategies in response to changing circumstances
- * Inclusive: prioritise broad consultation to create a sense of shared ownership in decision-making
- * Integrated: bring together a range of distinct systems and institutions¹⁹.

The *100 Resilient Cities* document has examples of how these qualities of resilience are demonstrated. It also identifies the following principles:

Resilience enhances sustainability. Resilience and sustainability both require that we see the world as a complex system and demand fundamental change in the way people think about how we depend on it. Managing for resilience – building the adaptive capacities to withstand and recover quickly from shocks and stresses – enhances the likelihood of sustainable development in changing environments where the future is unpredictable.

Resilience is a shared responsibility: Building resilience is not the task of a single actor or a single sector, no matter how innovative or passionate. Rather, building resilience requires partners from every sector: governments who must create the right policies, plans and infrastructure investment; businesses who ensure the functioning of our economic systems; communities and civic institutions who must organise to be more flexible, responsive and robust; and organisations and individuals who have the core skills required to adapt and cope.

¹⁸ Potangaroa, R. (2016) *Measuring resilience through quality of life: The experience of Māori and polynesians in the eastern suburbs of Christchurch following the February 2011 earthquakes*, People in Disasters Conference 2016, Canterbury District Health Board, February, <http://www.peopleindisasters.org.nz/abstract.asp?id=176>

¹⁹ Rockefeller Foundation, 100 Resilient Cities, <https://www.rockefellerfoundation.org/our-work/initiatives/100-resilient-cities/>

In December 2013, Christchurch was selected by The Rockefeller Foundation to take part in the global *100 Resilient Cities* Network. Christchurch Mayor Lianne Dalziel, speaking on the 5th anniversary of the 22 February 2011 earthquake, said:

Christchurch has always been known as the garden city, but that now means so much more than flower gardens. Christchurch will be known for its resilient food co-ops, environmental sustainability and energy efficiency. This gives a whole new meaning to what our future garden city will be all about...Five years on, the city's infrastructure is much more resilient and there is a much more caring community environment where people look after each other²⁰.

The Wellington Region Emergency Management Office's Community Resilience Strategy, September 2014, offers two principles for resilience in today's world:

It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change. *Charles Darwin, Naturalist*

We are living through the most immense transfer of power from institutions to individuals in history. *Nancy Gibbs, Managing Editor of Time Magazine*

5. Stories of Resilience

Stories showing examples of practical community resilience can be a powerful way of illustrating the concept. The following stories were told to the author (sometimes several times) during this project.

Examples from Canterbury earthquakes

1. Sam Johnson and the Student Volunteer Army

Local students, led by Sam Johnson, organised a remarkable Facebook campaign, which grew a communication network in the space of a week from 5,000 to 24,000 people. They coordinated 10,000 people to help clean up the city²¹.

Sam Johnson identified what worked well: the value of a simple and clear purpose; a diverse leadership team of 15 people; distributed and non-hierarchical leadership with high trust; high social capital; delegated autonomy to team leaders to make decisions; multilayered media and other communications including mainstream media, social media and word of mouth; invitation to anyone to help regardless of skills; focus on supporting health and wellbeing of volunteers; importance of digital technology skills, and the

²⁰ Mayor Lianne Dalziel, REDnews, 22 February 2016 <http://www.westpac.co.nz/rednews/christchurch-5/a-word-from-mayor-lianne-dalziel/>

²¹ YouTube video on Sam Johnson, Student Volunteer Army
<https://www.youtube.com/watch?v=Se0pbPn2OXw>

valuable contribution that volunteers could make to support agencies in checking out people's welfare.

Lessons learned about what could have worked better included: if council managers had held greater delegated authority during an emergency, there would have been faster decisions in the 'response' phase, eg use of parks; if community organisations had been previously invited to meet with council and Civil Defence Emergency Management teams in the 'readiness' phase, they would have been able to contribute to planning and had better social connections to apply under the immense pressure of the 'response' phase.

This story illustrates the resilience principle of a community's capacity to act effectively in a crisis, in this case by rapid mobilisation of volunteers to help those in need.

2. Rachael Fonotia and the Aranui Community Trust, Christchurch

Rachael Fonotia manages the Aranui Community Trust (ACTIS). Aranui is a low socio-economic area, but it has a strong community where people mostly know their neighbours well. ACTIS was established 10 years ago, and was therefore already well connected with its community, and with government agencies such as MSD, Christchurch City Council and non-government organisations. They secured funding for their community; for example, through MSD's Stronger Communities Action Fund (SCAF) and a Heartland contract. In Aranui, 70% of households do not have a computer, so ACTIS distributed a printed newsletter to 3,000 homes. The Trust has released a video on Facebook which shows three major developments after the Canterbury earthquakes: a new housing project by Housing New Zealand (finished in April 2016), a new school, Haeata (opening in 2017), and a new community centre (opening mid-2016). In each case there has been a close working relationship with the community²². The Aranui Community Trust, other community organisations and Christchurch City Council have prepared an *Emergency Response* information booklet released in December 2014 and distributed to households in Aranui, Avondale, Bexley and Wainoni. The plan is designed to help households to prepare themselves for an emergency, and guide the community's response to an emergency.

This story illustrates the ability of a community to survive, adapt and grow in the aftermath of a shock.

²² Aranui Video Update , Aranui Community Trust Incorporated Society (ACTIS), 2016
<https://www.facebook.com/AranuiCTIS/videos/vb.672619062867862/820809244715509/?type=2&theater>

3. Lyttelton Time Bank

The Lyttelton Time Bank²³ existed before the Canterbury earthquakes. Time banking is a way of trading skills in a community, using time rather than money as the measure for trading. Teach a child to read, and someone else will walk your dog. Help the elderly to carry their bags, and someone else will sew you a bag. It has a one plus one formula. A member of the time bank does an hour's work for another member, and earns a credit of one hour. They can use that credit to ask a member to do something for them; for example, child-minding, gardening, graphic design, or legal advice. Each transaction is logged into the time bank. The Lyttelton Time Bank has 435 members. The former Lyttelton West School was a member at the time of the 2010 and 2011 earthquakes. Members could earn a credit by supporting early childhood reading development at the school. In return, the school children earned credits by doing jobs in the community like gardening, ironing and producing a weekly radio show. The children learned to interact with the community. The approach illustrates the African saying: "It takes a village to raise a child".

Following the Canterbury earthquakes, the Lyttelton Time Bank was a ready-made mechanism for building and mobilizing resources in the community. Mayor Lianne Dalziel commented that the Lyttelton Time Bank was an example of evidence that where communities were well organized before the earthquakes, they did better in the response and recovery phases that followed.

This story illustrates the *100 Resilient Cities*' quality of a community which is 'Robust: well-conceived, constructed and managed systems'.

4. Ryan Reynolds and Gap Filler

A resilient initiative that sprang up in response to the destruction caused by the Canterbury earthquakes is Gap Filler, led by Ryan Reynolds. It is an organisation dedicated to finding creative, innovative and communally significant ways to use and develop vacant lots throughout the city. There is no shortage of these following the demolition of seismically unsafe buildings. Gap Filler's projects include a miniature golf course, spreading hole-by-hole on abandoned lots throughout the city, and the Pallet Pavilion, an outdoor performance venue pieced together out of shipping pallets with the help of 250 volunteers. The Pavilion was so well liked that approximately \$80,000 was raised through crowd-sourcing to keep the space in operation for an additional year. Greening the Rubble and Life in Vacant Spaces are two similar organisations giving 'transitional' function to the vacant lots in the city.

²³ Lyttelton Time Bank

<https://www.youtube.com/watch?v=gN6QvhoY6F4>
www.youtube.com/watch?v=mEEcPqqA_6Y

These initiatives have had a huge effect in promoting and encouraging social cohesion by re-enlivening Christchurch's streets - creating activity and fun, where there were once only grim reminders of the earthquakes and their toll²⁴.

This story illustrates the *100 Resilient Cities*' quality of 'Resourceful: recognizing alternative ways to use resources'

5. Wage Subsidy Scheme

In the days following the 22 February 2011 Canterbury earthquake, Peter Townsend, CE of the Canterbury Employers Chamber of Commerce, made an urgent phone call to Hon Bill English, Deputy Prime Minister and Minister of Finance. It was a call for help. The destructiveness of the earthquake meant that many businesses were in danger of going under, and many employees would lose their jobs. The Minister moved swiftly. The Government, through the Ministry of Social Development (MSD), created the Christchurch Earthquake Support Package, to provide financial support to affected employers and employees. The Government's main concerns were to remove uncertainty about jobs and businesses in Christchurch, and help people pay their bills.

The six-week package was made up of two components: the Earthquake Support Subsidy, which gave companies \$3,000 gross to pay an employee for six weeks (\$500 gross a week) or \$1,800 gross to pay a part-time employee for six weeks (\$300 a week); and the Earthquake Job Loss Cover, a subsidy for those who were unable to contact their employer or whose employer had closed the business permanently. The subsidy involved a \$400 weekly payment for six weeks to full-time employees and \$240 a week for part-time employees.

People were encouraged to apply online. Applicants could call a 24/7 government helpline or visit one of seven Work and Income offices in Christchurch. Ministry staff designed and built the online Earthquake Employment Support System during a weekend, using rapid deployment methodologies for system development. MSD operated the system in partnership with IRD and Westpac. The system began to operate six days after the earthquake, with \$53 million paid in the first week. By the end of June 2011, 20,000 employers and 50,000 employees had received a combined total of \$202 million. The total costs of developing the system were estimated to be about \$250,000. Strong ministerial and departmental sponsorship meant extremely tight control, with decisions made almost immediately. The extreme and special circumstances allowed MSD to rethink its 'normal' business, and what they had learned from this experience to provide better, faster services and to consider the implications of minimal verifying. The Controller and Auditor-General provided a report on the project²⁵.

²⁴ Gap Filler with Ryan Reynolds <https://www.youtube.com/watch?v=TbhHkuB9uLA>

²⁵ Controller and Auditor-General (2012) *Part 3: Financial support in Christchurch after the February 2011 earthquake*, Report of the Office of the Auditor-General New Zealand, 'Realising benefits for six public sector technology projects', 2012, <http://www.oag.govt.nz/2012/realising-benefits/part3.htm>

This story illustrates the *100 Resilient Cities*’ quality of: ‘Robust: well-conceived, constructed and managed systems’, developed and implemented at pace.

6. Tom Thomson, EPL (Elastomer Products Ltd), Christchurch

Tom Thomson, Managing Director of EPL (Elastomer Products Ltd), which makes plastic extrusion products like milk tubes used in cow sheds, told his story. He was visiting his plant in Thailand, when the Canterbury earthquake of 22 February 2011 struck. His family alerted him to the earthquake. They were safe but his ex-wife was killed in the CTV building collapse. He tried to find out what had happened to his business, but communications were chaotic. He managed to get back to Christchurch 2 days after the earthquake, to find his Bromley plant had been severely damaged, with potential loss of jobs to his 125 New Zealand-based staff, 80 of whom worked in Christchurch, and financial ruin to his company.

He pulled his management team together, and said: “We’re going to save the company. Who’s in and who’s out?” His management team came in behind him. His first task was to marshal the resources to stabilise the building, to make it safe for staff and get the plant operational again. (He secured the last generator in Christchurch). His principle was: “if you look after your people, they will look after you”. Tom said: “that was returned in spades”. Prime Minister John Key visited the plant in May 2011 and said to staff: “What you guys have achieved is simply incredible”. Meanwhile, Tom obtained insurance payment, began the process of identifying a site to build a new plant, and chose the Portlink Industrial Park. After overcoming a variety of bureaucratic challenges, the plant was designed, consented, constructed and opened in late 2014.

Tom, who has been President of Plastics New Zealand for many years, reflected on what he had learned from this experience. He was able to use his contacts to get two B-trains of large drinking water containers manufactured in the North Island and brought to Christchurch, where they were much needed. The civil defence structure was not able to deliver them to the people who needed them, so he arranged the delivery himself. He said that council needs a different set of rules that can be applied to ensure resilience in an emergency of this enormity.

This story illustrates the resilience of a firm that was able to withstand a shock, act effectively in a crisis, adapt to changing conditions and grow over time.

Example from Wellington

8. Island Bay tsunami risk awareness

The Wellington Region Emergency Management Office's Community Resilience Team engages with diverse communities, to encourage local people to develop new solutions. For example, the Island Bay community recognised their tsunami risk and came up with a solution to raise public awareness, by painting a blue line across the main road to indicate where the Tsunami Safe Zone starts. The Seatoun School took serious note that it is within the area at-risk from tsunamis. They decided to build an accessway to allow evacuation. The school raised \$25,000 and Wellington City Council contributed \$15,000 to allow the accessway to be built. The project went on to receive the Global Award for Public Awareness from the International Association for Emergency Management in 2012.

This story illustrates the *100 Resilient Cities*' quality of 'Inclusive: prioritise broad consultation to create a sense of shared ownership in decision-making'.

Example from New York

9. Lower Manhattan Dryline, urban flood protection infrastructure

Following the devastation of Hurricane Sandy in October 2012, The Rockefeller Foundation funded a *Rebuild by Design* competition. A major resilience issue exposed by the hurricane was the vulnerability of New York to coastal flooding. To address this, a project called *The Dryline*, an urban flood protection infrastructure in Lower Manhattan Island, was chosen and received US \$176 million of federal funding. It includes a 12 km infrastructural floodwater barrier, with shutters that close in an emergency, and large areas of public space with parks, seating, pavilions, bicycle shelters and skateboard ramps²⁶.

This story illustrates the *100 Resilient Cities*' quality of 'Redundant: spare capacity purposively created to accommodate disruption'

Example from New Orleans

10. Revitalisation of New Orleans after Hurricane Katrina

Hurricane Katrina hit the Gulf Coast on 28 August 2005, and caused devastation, particularly to New Orleans. The process of planning for revitalization began in late September 2015 with the formation of the Bring New Orleans Back Commission. There were many challenges before the vision for a revitalised New Orleans emerged. Judith Rodin described what happened:

²⁶ Rockefeller Foundation, *100 Resilient Cities*, <https://www.rockefellerfoundation.org/our-work/initiatives/100-resilient-cities/>

In addition to an improved education system and a new approach to environmental issues, the vision for a revitalised New Orleans is one of innovation and economic growth. Not only is the population growing; there has been a 'brain gain', an influx of smart, energetic, entrepreneurial people who are attracted to the area because of the opportunities it presents. In 2006 and 2007, moving to New Orleans was like "committing to the wild, wild West," says Leslie Jacobs.

As a result, the pace of economic activity in New Orleans has picked up remarkably, and the goal is to become a hub of innovation along the lines of San Francisco and Silicon Valley...The city has become nationally recognized as a hotbed of business creativity and innovation, named by Forbes as the number 1 "brain magnet". *Inc.* magazine ranks New Orleans as the "coolest start-up city" in the country²⁷.

This story illustrates the capacity of a city to withstand a catastrophic event and over time bounce back stronger: New Orleans has emerged as a hub of innovation.

Example from Japan

11. Fukushima Daiichi nuclear power plant

In Japan on 11 March 2011, a Richter magnitude 9.0 earthquake triggered a tsunami, and killed nearly 20,000 people. The Fukushima Daiichi nuclear power plant was so badly damaged it is now recognised as the second-worst nuclear disaster globally, after Chernobyl. The nuclear power plant suffered catastrophic damage and a partial meltdown, and its reactors released dangerous quantities of radiation. Although no deaths directly resulted from the nuclear plant dysfunction itself, 270,000 citizens were made refugees by the disaster, with about 100,000 of them losing their homes.

The National Diet's Fukushima Nuclear Accident Independent Investigation Commission's report says that one of the causes was a distressing lack of diversity of views. 'Groupthink' made it possible for a group of highly skilled and experienced engineers and administrators to miss signals about the facility's vulnerabilities, both before the tsunami struck and as the crisis turned into a disaster²⁸.

This story illustrates the resilience principle of the importance of diversity of thinking to avoid 'groupthink' and achieve robust solutions.

²⁷ Rodin, Judith (2015) *The Resilience Dividend, Managing disruption, avoiding disaster, and growing stronger in an unpredictable world*, Profile Books Ltd, London, The Rockefeller Foundation, 2015.

²⁸ Rodin, Judith (2015) *The Resilience Dividend, Managing disruption, avoiding disaster, and growing stronger in an unpredictable world*, Profile Books Ltd, London, The Rockefeller Foundation, 2015.

6. Resilience Frameworks

100 Resilient Cities

The *100 Resilient Cities* initiative by the Rockefeller Foundation uses a City Resilience Framework, shown in Figure 3. The framework includes four 'dimensions', and three 'drivers' within each dimension. They are:

- 1 Health and wellbeing
 - Meets basic needs
 - Supports livelihoods and employment
 - Ensures public health services
2. Economy and society
 - Fosters economic prosperity
 - Ensures social stability, security and justice
 - Promotes cohesive and engaged communities
3. Infrastructure and environment
 - Provides reliable communication and mobility
 - Ensures continuity of critical services
 - Provides and enhances natural and man-made assets
4. Leadership and strategy
 - Promotes leadership and effective management
 - Empowers a broad range of stakeholders
 - Fosters long-term and integrated planning

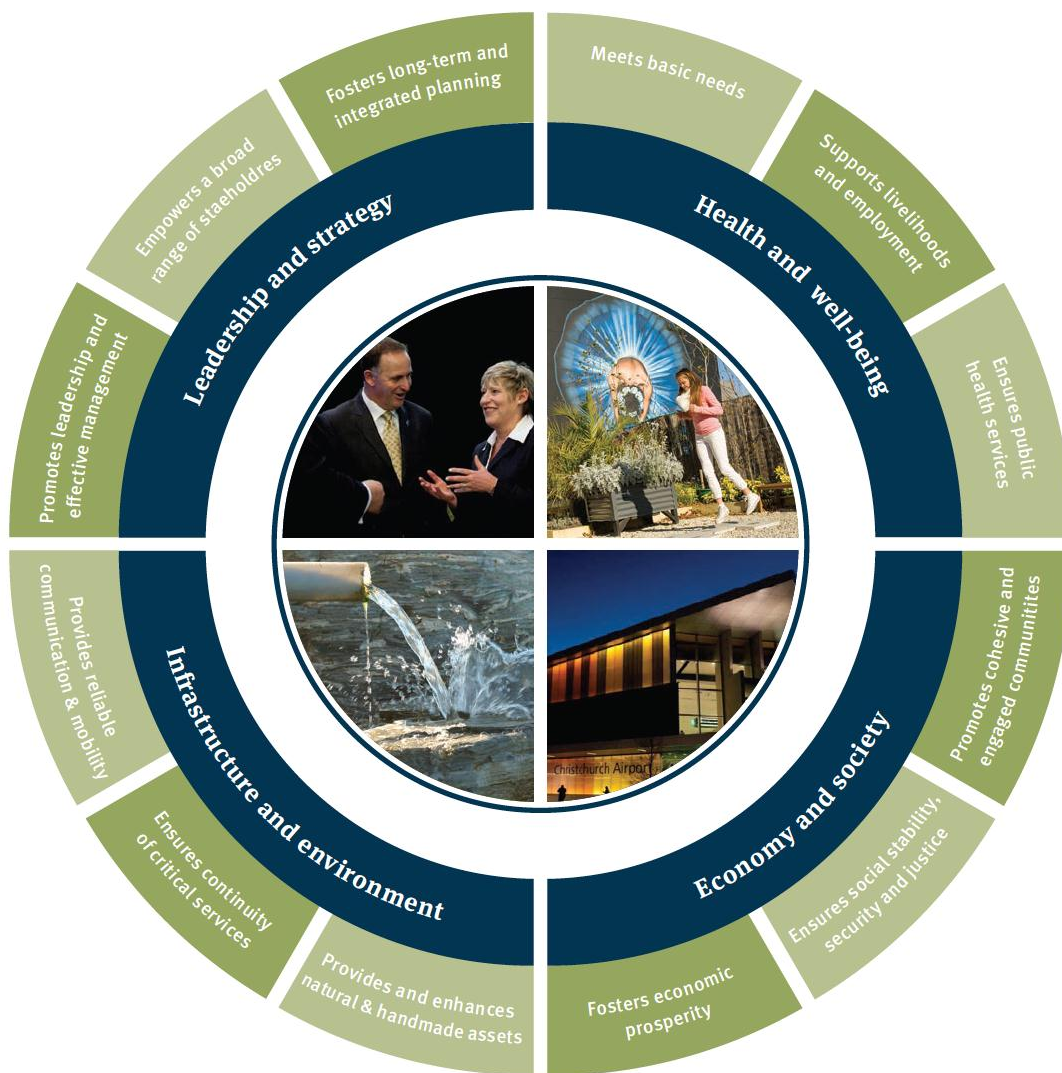


Figure 3. *100 Resilient Cities*: after Christchurch City Resilience Framework

Christchurch

Christchurch was among the first 33 cities selected from over 400 city applications to join the 100 Resilient Cities network. The letter of application was one of Christchurch Mayor Lianne Dalziel's first official acts. The Mayor explained her definition of resilience as:

A community is not the co-location of houses – that's a suburb. Leadership is not a position you hold – it is a mark of your character. And resilience is not being strong in the face of adversity – that is stoicism. Resilience is about the capacity to plan and prepare for adversity, the ability to absorb the impact and recover quickly, but more importantly, it's about the ability as a community to adapt to a new environment, to thrive in the face of adversity and to co-create our new normal. And it is in that space that we see the world of opportunity that our disaster has offered us²⁹.

Mike Gillooly was appointed the Chief Resilience Officer, Christchurch City Council. Christchurch completed a Preliminary Resilience Assessment in September 2015²⁹. This assessment summarises resilience strengths, challenges and opportunities, and provides the foundation for developing a resilience strategy for Greater Christchurch.

The following themes emerged from the first stage of research and consultation:

1. Housing affordability and accessibility
2. Securing the city's future in eastern parts of Christchurch
3. Understanding risk and tools for mitigation
4. Community and social cohesion
5. Community leadership
6. Building trust between community and decision-makers
7. The role of innovation
8. Urban form

Four focus areas have been identified based on these underlying themes, which will become the 'paths of inquiry' for the second stage of the strategy process:

1. Participative leadership and governance - fostering community leadership and more participatory forms of decision-making
2. Securing a prosperous future - fostering innovation and attracting new people and ideas to the local economy
3. Understanding and responding to future challenges - ensuring communities are better prepared for whatever the future brings
4. Connected neighbourhoods and communities - ensuring communities are healthy, affordable and safe.

Darren Wright, Chair of the Community Forum set up by CERA, said that a lesson is that council should be flexible enough to allow the community to take initiatives, and be bold enough to accept there will be some mistakes. Perhaps in the readiness phase, a different set of 'rules' to normal should be worked out that will apply in the response and recovery phases. He also talked about the difficulty of government and council working out who is 'in control' during the heat of the response and recovery. He suggested that perhaps, on a national basis, there could be worked out in advance a threshold above which the financial and economic impacts are so large that the government takes control, and otherwise control is with the council and the community, for response and recovery.

²⁹ Christchurch City Council (2015) *Greater Christchurch Preliminary Resilience Assessment*, Christchurch, September.

Wellington

The Wellington Region Emergency Management Office (WREMO) *Community Resilience Strategy*³⁰ takes a community engagement and empowerment approach to emergency management. It outlines how the WREMO will engage with diverse communities and apply a wide range of tools to empower them to survive and thrive after an emergency event. It is broadly driven by three strategic objectives, which are: build capacity, increase connectedness and foster cooperation.

Figure 4 shows WREMO's Community-driven Emergency Management model. It is described in the Strategy as follows:

The model below represents WREMO's systematic approach of turning resilience theory into operational practice by linking households and businesses to their neighbours, then to the larger geographical community through to the official CDEM structure. The foundation of a resilient community begins in the home and workplace, where people have the greatest effect on their own lives. The majority of the tools in this Strategy are aimed at the bottom levels and do not require external guidance from an Emergency Manager. In contrast, the Resilience Team primarily engages with community leaders to help them drive change and help others be better connected and prepared for a disaster. At the top of the pyramid, and occupying the smallest amount of space, is a supportive CDEM actively supporting all of the stakeholders through all phases of Emergency Management. Each level is dependent on the others surrounding it, with the formal and informal response connecting through the Civil Defence Centre.

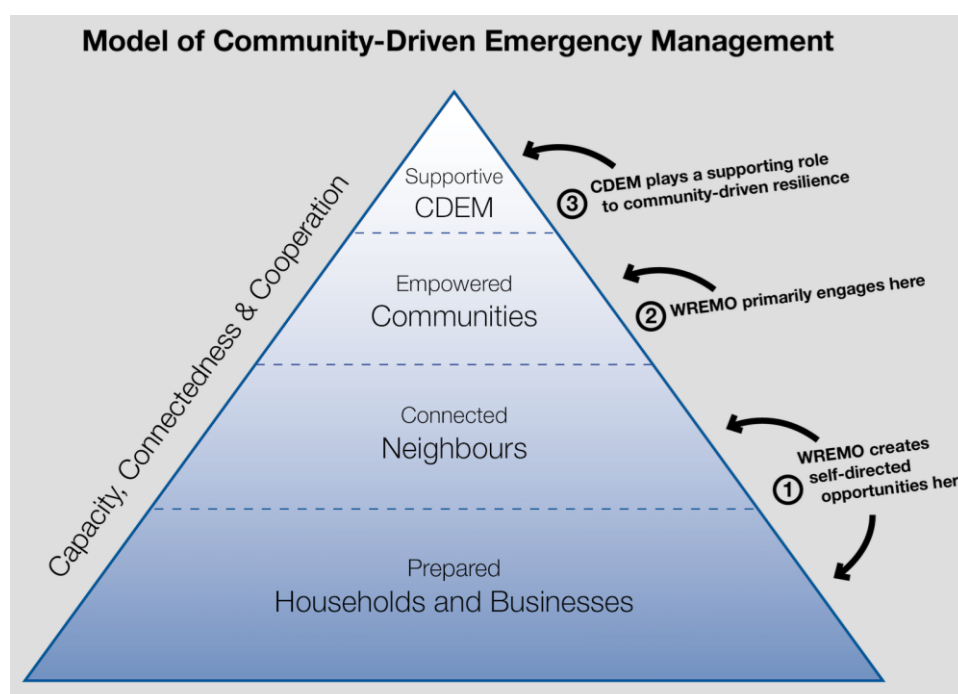


Figure 4 A Model for Community-Driven Emergency Management, after WREMO³⁰

³⁰ Wellington Region Emergency Management Office (2014), *Community Resilience Strategy, Second Edition, Building Capacity – Increasing Connectedness – Fostering Cooperation*, September 2014

The WREMO concept could be called an 'iceberg' model. The visible part of the iceberg is support by 8/9 of its volume below the water line, just as the 'visible' CDEM is supported by the empowered communities, neighbourhoods, households and businesses.

In 2013, the Wellington Region was selected as an international Centre of Excellence in Community Resilience through the United Nations Integrated Research on Disaster Risk programme.

Wellington City followed Christchurch by becoming one of the 100 Resilient Cities in the second round of selections. Mike Mendonça, Chief Resilience Officer, Wellington City Council, is following a similar approach to that described above by Mike Gillooly, Chief Resilience Officer, Christchurch City Council (see page 22).

Mike Mendonça's analysis is that there is a confluence of three big issues:

1. The Sendai Framework: shift from 'managing disasters' to 'managing risk';
2. Infrastructure: 70% of the infrastructure that will be in place by 2050 hasn't been built yet; and
3. Climate Change: The Parliamentary Commissioner for the Environment's report on sea level rise has huge implications for local government across the country³¹.

"We have a unique opportunity to get things right for the next 100 years"

Other points he made were: that resilience has to be community-driven, the great majority of people are rescued in disasters by their neighbours, and the importance of the role of Lifelines groups.

Kapiti Coast District Council, in the Wellington Region, had a difficult experience with resilience thinking. They plotted on maps the inundation zones due to projected sea level rise and decided to identify on LIM reports where properties were within the inundation zones. This followed a good principle of transparency. It also evoked a strong negative reaction from affected property owners, which forced the council to rethink its position. This experience is well known and may make other councils cautious. Nevertheless, if we are to be a resilient nation, transparency of information about risks is very important.

³¹ Wright, J. (2015) *Preparing New Zealand for Rising Seas: certainty and uncertainty*, Wellington: Parliamentary Commissioner for the Environment

Auckland

Earlier this year, Auckland Council and Auckland Civil Defence Emergency Management released a Draft Group Plan entitled *Working together to build a resilient Auckland 2016-2021*³². After considering submissions, the plan is now being finalized.

The vision in the draft Plan is: *Working together to build a resilient Auckland*.

It includes the following five goals:

1. Reduction: Reducing risks from hazards in Auckland
2. Readiness: Increasing community awareness, understanding, preparedness and participation in emergency management.
3. Response: Enhancing capability to manage disasters
4. Recovery: Enhancing Auckland's capability to recover from disasters
5. Auckland-specific Goal: Building resilience to disasters into Auckland's communities and businesses

It includes the following approach to developing resilient communities:

- Shared responsibility: in adversity, people and communities are the true source of strength; resilience is a shared responsibility
- Ownership and participation: everyone must play a part through networks - government, business, community
- Trust: trusting and open relationship with stakeholders is essential to build and sustain resilience across communities
- Social values: recognise that beliefs, ideas and values are critical to community development and social change

It includes a Framework for Action to Build Resilience, based on the following activities:

- Knowledge through education
- Volunteer participation
- Emergency Management planning
- Business and organisational resilience
- Strong partnerships
- Capability and capacity
- Information and communication technologies
- Recovery – 'Build Back Better' principle
- Auckland's communities
- A safe city
- Co-created research
- Leadership and governance
- Liveable city

³² Auckland Civil Defence Emergency Management and Auckland Council (2016) *Working together to build a resilient Auckland*, Auckland Civil Defence and Emergency Management Draft Group Plan 2016 – 2021, Summary document

John Dragicevich, Director, CDEM Auckland, stressed the importance of the spiritual connection in a community, illustrating from his personal experiences in West Auckland and South Auckland, where a strong 'spirit of the community' is a powerful driver of resilience.

The next section moves from resilience frameworks to discuss one of the key elements of resilience, infrastructure.

7. Infrastructure Resilience

The Thirty Year New Zealand Infrastructure Plan

The Thirty Year New Zealand Infrastructure Plan (2015) has a theme of resilience running through it. The vision is:

'By 2045 New Zealand's infrastructure is resilient and coordinated and contributes to a strong economy and high living standards'.

Lindsay Crossen, Chair, National Infrastructure Advisory Board says "To be effective, long-term planning will need to consider a range of questions: does an infrastructure solution meet demand; is it compliant; is it fundable; does it add to resilience; is it affordable; does it meet aspirations for local, regional and national economies?"³³

National Infrastructure Unit - January 2014

The National Infrastructure Unit produced a one-page summary on Infrastructure Resilience in January 2014. It includes the model in Figure 5. It makes the distinction between:

- Risk Management, being about Known Knowns and Known Unknowns; and
- Resilience, being about Unknown Unknowns

It shows risk management in the wider context of Resilience, and both of these within the scope of sustainability. It links to the Treasury Living Standards Framework³⁴. It says that economic costs can be materially reduced by a resilience approach, thereby relieving long-term pressures on local and central government budgets.

³³ National Infrastructure Unit (2015) *The Thirty Year New Zealand Infrastructure Plan 2015*, Wellington: National Infrastructure Unit, The Treasury, August
<http://www.infrastructure.govt.nz/plan/2015>

³⁴ The Treasury *Living Standards Framework*
www.treasury.govt.nz/abouttreasury/higherlivingstandards/his-usingthefr...

It sets out attributes for resilience:

- Service Delivery: focus on national, business and community needs
- Adaptation: national infrastructure has the capacity to withstand disruption, absorb disturbance, act effectively in a crisis, and recognize changing conditions over time.
- Community preparedness: infrastructure providers and users understand the infrastructure outage risks they face and take steps to mitigate these.
- Responsibility: individual and collaborative responsibilities are clear between owners, operators, users, policy-makers and regulators.
- Interdependencies: a systems approach applies to identification and management of risk (including consideration of interdependencies, supply chain and weakest link vulnerabilities).
- Financial strength: financial capacity to deal with investment, significant disruption and changing circumstances.
- Continuous: on-going resilience activities provide assurance and draw attention to emerging issues.
- Organisational performance: Leadership and culture, Networks and Change-Ready are capabilities conducive to resilience.



Figure 5. Risk, Resilience and Sustainability, after National Infrastructure Unit (NIU)

The NIU one-page summary on Infrastructure Resilience also includes:

- Game Changers (first order)
 - Maintain national focus on resilience, for example through the 30-year New Zealand Infrastructure Plan
 - Regional vulnerability assessments, which could be part of regional plans
 - Champions of resilience (Note: this report for SOLGM recommends that councils take on this role)
 - Interdependencies (cascade failures, multi-hazards)
- Game Changers (second order)
 - Re-mobilise 'Lifeline utility operators'
 - Challenge current paradigms (eg adopt a 'fail-safe' approach as on page 4 under 'Engineering', rather than a low-damage approach which would be more expensive)
 - Denser urban forms (which create more connected and resilient communities)

Smart Cities - LINZ, February 2016

Land Information New Zealand (LINZ) has produced a one-page summary on 'Creating smarter cities for safer communities'. New sensing technologies (for example, those that monitor traffic congestion) allow cities to be actively managed and monitored.

Investment in these technologies is seen globally as an important next step in managing urban environments. The availability of this type of accurate data, and how it can inform investment decisions, is critical to determining how smart cities might improve social outcomes, community wellbeing and resilience.

In 2014/15 LINZ obtained Better Public Services funding from Treasury, to invest in projects which support gaining a better understanding of how cities operate. Such knowledge could lead to the development of an integrated smart city national network, or 'smart nation'. This will support resilience.

Asset Metadata (shared data) Standards – LINZ and MBIE, February 2016

Metadata standards refer to 'data about data'. It is structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use or manage data resources and knowledge. There is a current Metadata Standards Project involving LINZ, MBIE, Treasury, local councils, central government, and private industry. It relates to three critical pieces of public asset infrastructure: roads, three waters and buildings.

This project will provide for a common approach to use of data. It will therefore help improve the way we manage that infrastructure, and make our built environment more resilient.

The next section moves from how to achieve resilience, to how to measure whether we have achieved it.

9. Measuring Resilience

This section discusses how we can measure both the resilience of an organisation, and community-facing resilience, such as transport infrastructure.

Measuring Resilience of Organisations

Resilient Organisations is a research and consulting group focused on helping organisations, industries, and economies to thrive in any environment. It is a social enterprise, aiming to maximise the positive social impact of its work. Its advice includes resilience benchmarking and advising on the best ways to improve resilience.

The research of Resilient Organisations has resulted in the model shown in Figure 6. Resilience of an organisation depends on three inter-related capabilities:

- Leadership and culture
- Networks and relationships
- Change ready

Resilience indicators are shown in Figure 6.

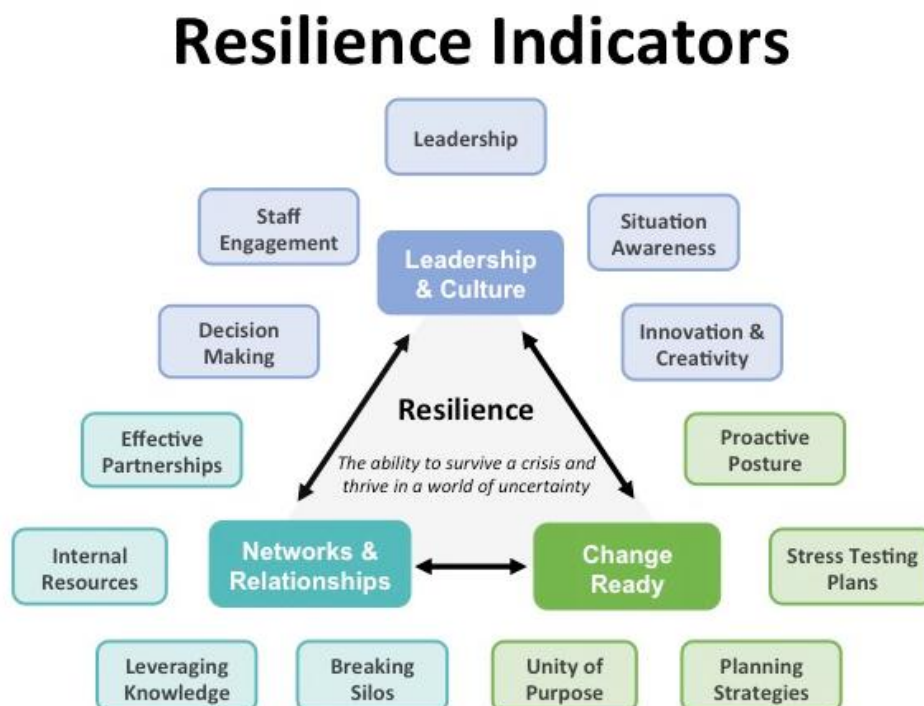


Figure 6. Resilience Indicators, after Resilient Organisations

The Resilient Organisations' website (<http://www.resorgs.org.nz/>) has a benchmark resilience tool. It is a survey intended to measure the resilience of an organisation, allowing it to benchmark itself against other organisations in the same or related industries. Such benchmarking can support sector and supply-chain resilience initiatives, as well as provide the organisation with a self-analysis of resilience strengths and weaknesses to support the business case for internal resilience initiatives.

Also on the website is a paper from National Science Challenges: Resilience to Nature's Challenges, on 'Resilience Benchmarking and Monitoring Review'.

Measuring Resilience of Communities

On page 5 there is a reference to the work of Douglas Paton on measuring and monitoring community resilience. As discussed on page 9 of this report, social capital is a driver of community resilience. Measurements of indicators of social capital will therefore also be indicators of community resilience. Many councils survey their communities on indicators of social capital, such as trust of institutions and connectedness.

Measuring Resilience of Transport Infrastructure

AECOM New Zealand Ltd has undertaken research for New Zealand Transport Agency (NZTA) on "measuring the resilience of transport infrastructure"³⁵. A broadly quantitative approach to measuring resilience is proposed, with a range of specific measures/categories.

This section has referred to work to date on measuring the resilience of organisations, communities and transport infrastructure. Further work should be undertaken to develop measures of resilience, both at an organisational level, and at an outcomes level relating to resilience of communities, infrastructure, districts, cities, regions and the nation.

The next three sections deal with the relationship between resilience and recovery, resilience and the 4Rs of Civil Defence Emergency Management, and the review by MCDEM that will lead to a *National Disaster Resilience Strategy*.

³⁵ Hughes, J. and K.Healy (2014) *Measuring the resilience of transport infrastructure*, NZ Transport Agency research report 546, Contracted research organisation: AECOM New Zealand Ltd, February

9. Recovery

The Canterbury Earthquake Recovery Learning and Legacy (CERLL) team, led by its Executive Director, Elizabeth McNaughton, is enabled by the Department of the Prime Minister and Cabinet (DPMC). The purpose of the CERLL programme is to collate and present relevant insights, information and experiences that will better equip leaders, communities and those directly involved in disaster recovery.

Using design thinking to test and refine them, the team has developed five recovery themes that apply across the recovery system. The themes fit across the recovery environments. The diagram in Figure 8 shows the interplay of the themes and recovery environments. Features of it are:

- It has the community at the centre
- The five 'petals' of economic, built, natural, and social components of resilience are as in the model developed by MCDEM, with the addition of a cultural component
- The five circles in orbit are the themes of recovery - the essentials to get right: understanding the recovery context, leadership and governance, resource allocation, communication and engagement, conditions of innovation.



Figure 8. Model of Recovery, after CERLL programme

The CERLL programme aims to effect positive change so we can learn, prepare and act more effectively to complex challenges and shocks.

The programme will achieve this by:

- EQ Recovery Learning Website – an online collection of learning products
- Learn, Prepare, Act Report – a collection of transferable, system-wide learning creating an actionable plan for disaster recovery
- Tools for practitioners – a collection of tools and resources to assist effective disaster recovery

In her previous role at New Zealand Red Cross, Elizabeth McNaughton co-authored (with Jolie Wills of New Zealand Red Cross and David Lallemand of Stanford University) a report entitled “Leading in Disaster Recovery: a companion through the chaos”³⁶. After past disasters, people frequently said: ‘If only we had known what to do’. Here was an opportunity to create a learning legacy from the Canterbury earthquakes recovery. It involved distilling the wisdom of more than 100 leaders in recovery in New Zealand and internationally, and has resulted in a companion (document) to serve and support others.

The report begins with the whakatauki (Māori proverb):

Ehara taku toa, i te toa takitahi

engari he toa takitini

Mine is not the strength of one alone, it is the strength of many.

The companion has nine key messages from leaders in disaster recovery around the globe:

1. Having a noble purpose – people are the purpose
2. Being ethical – it takes courage to do the right thing
3. Being intentional – hope is not a method
4. Making decisions – perfect is the enemy of the good
5. Keeping perspective – seek wise counsel
6. Leading with empathy - it’s about real connection
7. Being innovative – because you have to
8. Supporting the team – people...not human resources
9. Prioritising self-care – to be effective

On leadership in recovery, the companion says:

Leadership in recovery is different. It is chaotic, where black and white becomes many shades of grey. It will require more from you as a leader than any other role you’ve ever had. It’s a horrible opportunity.

³⁶ McNaughton, E., J.Wills, D. Lallemand (2015) *Leading in Disaster Recovery: a companion through the chaos*, New Zealand Red Cross, download from: preparecenter.org/resources/leading-in-disaster-recovery

You will think harder and faster. You will do more, feel more, learn more than ever before. It will require all the skills you have and all the skills you don't yet have. Recovery is not business as usual. It is challenging at every level and deserves superb leadership.

The companion includes the diagram in Figure 9. It tells us that it is typical and normal: to experience a sense of camaraderie, unity and optimism in the early stages; for recovery to be a long, protracted journey; for people to have a hard time along the way; for ongoing stress to make it challenging to retain optimism, tolerance, the ability to problem-solve and empathise; and for the majority of people and communities to 'recover' and grow from the experience.

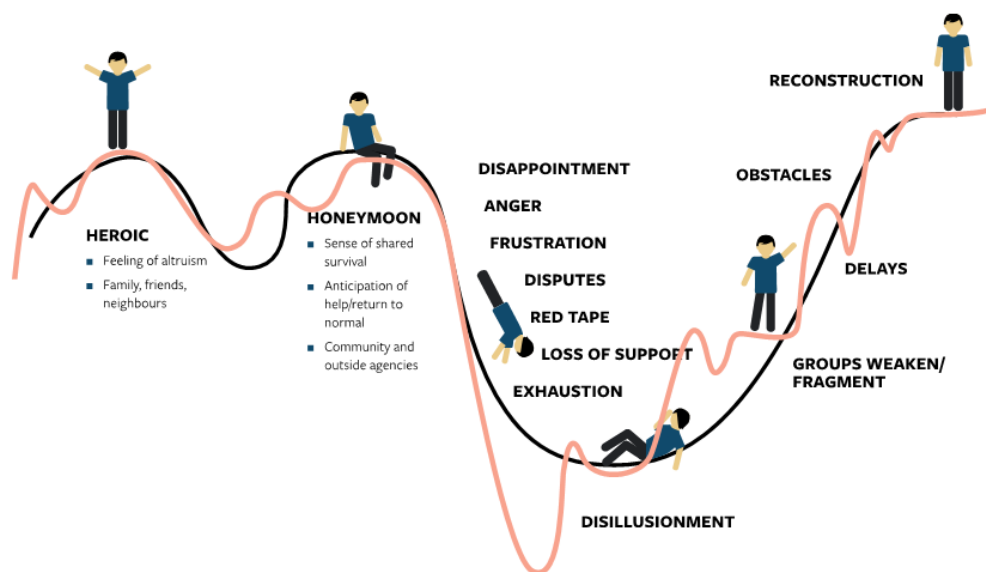


Figure 9. Psychological phases of recovery (Original source: Australian Disaster Manual, Emergency Management Australia).

10. Relationship between Community Resilience and the 4Rs of CDEM

The National Civil Defence Emergency Management (CDEM) Strategy sets out New Zealand's integrated approach to civil defence emergency management. It includes the four areas of activity, known as the '4Rs'. They are:

* **Reduction:** Identifying and analysing long-term risks to human life and property from hazards; taking steps to eliminate these risks if practicable, and, if not, reducing the magnitude of their impact and the likelihood of their occurring.

* **Readiness:** Developing operational systems and capabilities before a civil defence emergency happens; including self-help and response programmes for the general public, and specific programmes for emergency services, lifeline utilities and other agencies.

* **Response:** Actions taken immediately before, during or directly after a civil defence emergency to save lives and protect property, and to help communities recover.

* **Recovery:** The coordinated efforts and processes to bring about the immediate, medium-term and long-term holistic regeneration of a community following a civil defence emergency.

There is a difference between Community Resilience (as defined at the start of this report) and *Reduction, Readiness, Response* and *Recovery* (as defined by the National Civil Defence Emergency Management Strategy above). The following quotes illustrate the difference:

While the traditional Command and Control model emphasises a centralised, top-down approach, appropriate for the official portion of an emergency response, the Communicate and Collaborate model supports a partnership approach between community leaders and government to develop resilient solutions from the outset.

Community Resilience Strategy, Wellington Region Emergency Management Office³⁷

For our Council, it could mean a whole new approach to governance and I am open to that. We should be looking at a co-creation framework with a much more engaged community. If the earthquakes taught us one thing, it's that there is strength in our communities coming together to take charge of their destiny

Christchurch Mayor Lianne Dalziel, 24 September 2015³⁸

Any entity can build resilience. Too often, however, resilience thinking does not really take hold until a galvanising event or major shock – such as Superstorm Sandy – brings the need into high relief. But we should not need things to go terribly wrong for us to work to make them more right. We need to take action, and we need to do so in anticipation of disruption, in advance of shocks, in preparation for stresses – not after they have started to wear us down.

Dr Judith Rodin, President of The Rockefeller Foundation³⁹.

The 4Rs are a framework for conceptualising the disaster cycle and how the Civil Defence Emergency Management (CDEM) work changes throughout that cycle. Each action taken in those four areas should contribute to a more resilient society. The mode of operation is only 'command and control' in the 'response' phase of an emergency. In the 'readiness' and 'recovery' phases the approach is that of community development.

The extra dimension that current international thinking on resilience brings is the emphasis on building 'adaptive capacity', so that no matter how unpredictable and large the impacts of a shock or chronic stress, the community has the capacity to survive, adapt,

³⁷ Wellington Region Emergency Management Office (2014), *Community Resilience Strategy, Second Edition, Building Capacity – Increasing Connectedness – Fostering Cooperation*, September.

³⁸ Mayor Lianne Dalziel (2015) *Christchurch signs-off first stage of Resilience Strategy*, press release, Christchurch City Council, 24 September, www.scoop.co.nz> Regional

³⁹ Rodin, Judith (2015) *The Resilience Dividend, Managing disruption, avoiding disaster, and growing stronger in an unpredictable world*, Profile Books Ltd, London, The Rockefeller Foundation.

and grow. Concepts of an engaged community are also at the heart of community development. So what is different? As the Mayor of Christchurch said, there is strength in communities coming together to take charge of their destiny. The power of resilience thinking is that we should not all need to go through a Canterbury earthquake to learn that lesson: we need to take action now with our communities to help them build the capacity to take charge of their own destinies.

11. National Disaster Resilience Strategy Review

Sarah Stuart-Black, Director, MCDEM and Jo Horrocks, Principal Adviser, Emergency Management, MCDEM explained that MCDEM is reviewing the current *National Civil Defence Emergency Management Strategy*, based on the 4Rs: Reduction, Readiness, Response, and Recovery, with a vision of a “*Resilient New Zealand*”. There will be a new *National Disaster Resilience Strategy*.

MCDEM has set out the context of this review:

- The current CDEM Strategy has guided CDEM for 14 years.
- There is an opportunity to strengthen NZ’s ability to minimise the impact of disasters on our communities. International best practice is to “manage risk” rather than “manage disasters”.
- In March 2015, New Zealand committed to the Sendai Framework for Disaster Risk Reduction, 2015 – 2030⁴⁰.
- The intent is to examine where efforts would be best directed across the four priorities in the Sendai Framework: 1. understanding disaster risk; 2. strengthening disaster risk governance to manage disaster risk; 3. investing in disaster risk reduction for resilience; 4. enhancing disaster preparedness for effective response, and to ‘build back better’ in recovery, rehabilitation and reconstruction.

The model in Figure 10 shows:

- integration across the components of resilience of the nation: social, economic, infrastructural, environmental, cultural capital and governance
- the operational drivers of resilience: households, communities, cities/districts, society

⁴⁰ United Nations Office for Disaster Risk Reduction (UNISDR) (2015), *Sendai Framework for Disaster Risk Reduction, 2015-2030*, United Nations, www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf



Figure 10. Concept of National Resilience, after MCDEM

It is intended that this model could help provide a framework for the *National Disaster Resilience Strategy*.

The final sections of the report discuss the role of local authorities in building community resilience. First, the legislative basis.

12. Legislated role of local authorities in helping build community resilience

The role of local authorities in helping build community resilience is derived from the Local Government Act 2002 (including the latest amendments). The following relevant provisions are quoted from the Act:

Section 10: Purpose of local government

(1) The purpose of local government is—

- (a) to enable democratic local decision-making and action by, and on behalf of, communities; and
- (b) to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.

Section 11A Core services to be considered in performing role

In performing its role, a local authority must have particular regard to the contribution that the following core services make to its communities:

- (a) network infrastructure:
- (b) public transport services:
- (c) solid waste collection and disposal:
- (d) the avoidance or mitigation of natural hazards:
- (e) libraries, museums, reserves, and other recreational facilities and community amenities.

Section 14 Principles relating to local authorities

(1) In performing its role, a local authority must act in accordance with the following principles:

- (b) a local authority should make itself aware of, and should have regard to, the views of all of its communities;
[...] and
- (g) a local authority should ensure prudent stewardship and the efficient and effective use of its resources in the interests of its district or region, including by planning effectively for the future management of its assets; and
- (h) in taking a sustainable development approach, a local authority should take into account—
 - (i) the social, economic, and cultural interests of people and communities; and
 - (ii) the need to maintain and enhance the quality of the environment; and
 - (iii) the reasonably foreseeable needs of future generations.

Local authorities also have responsibilities relating to community resilience under the Civil Defence Emergency Management Act 2002; for example, section 12 ‘Local authorities to establish Civil Defence Emergency Management Groups’. There are also elements of resilience within the functions of local authorities under the Resource Management Act 1991 (RMA) and the Land Transport Management Act 2003.

The Government has introduced the Resource Legislation Amendment Bill 2015 into Parliament. The principal proposed amendments are to the RMA. The Bill adds a single matter of national importance to section 6 of Part 2 of the RMA: ‘the management of significant risks from natural hazards’. This follows recommendations from the Canterbury Earthquakes Royal Commission. It extends to earthquake-related matters and beyond inundation, subsidence and other flooding-related risks. For example, a significant risk of natural hazards will be a circumstance under which a consent authority can refuse subdividing consent. The Bill is still before the select committee.

This report for SOLGM on resilience recognises the initiative of Local Government New Zealand (LGNZ) to establish a Local Government Risk Management Agency, as described in the next section.

13. Local government risk management agency (LGRA)

On 5 June 2015, Local Government Minister Paula Bennett and Civil Defence Minister Nikki Kaye announced that:

An establishment board will be formed to assess whether local government's management of the risks from natural hazards to infrastructure and other assets can be strengthened. The \$1.6 million initiative will be jointly funded by the Crown and Local Government New Zealand (LGNZ).

The board will work closely with local authorities, LGNZ, and officials from the Department of Internal Affairs, the Ministry of Civil Defence and Emergency Management and The Treasury, to investigate the feasibility of a local government agency dedicated to risk management and insurance. If it considers the proposed agency should be established, it will prepare a business case for the Government to consider.

A concurrent review will also look at the existing funding arrangement between central and local government to restore certain infrastructure after emergencies, such as for water, wastewater, stormwater and river flood control. Under this arrangement, the government reimburses councils up to 60% of certain restoration costs.

It is expected that the establishment board will provide a comprehensive report to Ministers and LGNZ on the feasibility of the proposed agency by June 2016.

A progress report provided to the local government sector by LGNZ in February 2016 included:

The LGRA Establishment Board met in early February to consider a draft business case for a Local Government Risk Agency. The business case reflects the findings of a number of reports and the views of local authorities. The draft business case recommends establishing a LGRA and implementing it in two phases with an initial focus on assets and natural hazards, acknowledging that risk-based asset management will be integrated into the overall enterprise risk management practices of local authorities.

- Phase 1 will focus on closing the identified information and capability gap to bring New Zealand local authorities up to a higher standard for risk management and capability. For this, local authorities need support to gather more information of a consistent quality about their infrastructure and assets, assess their risk management maturity, and identify what needs to be done to close the gap.
- Phase 2 would focus on growing and maintaining a financially sustainable risk management capability.

The approach discussed in the business case is consistent with international moves to draw people's attention to preventing new risks, reducing existing risks, and strengthening resilience so communities and nations can recover from disasters more quickly.

Treasury will release a discussion document on the 60/40 review in April.

The Establishment Board will continue to reinforce the importance of the local government sector being able to consider the LGRA proposal and 60/40 review proposal in tandem.

The LGRA's primary focus is on planned risk management by local authorities. Good risk management will contribute to community resilience, as it relates to New Zealand's natural hazard environment and infrastructure. This provides the basic services that sustain people and communities.

The next section presents a proposed framework for local authorities' roles in resilience.

14. Recommended Framework for Local Authorities' Roles in Resilience

Figure 11 shows a proposed framework to start a discussion of local authorities' role in achieving resilience for households, communities, districts/cities/regions and the nation. This framework has been developed in collaboration with Jo Horrocks of the Ministry of Civil Defence Emergency Management (MCDEM). It specifically focuses on what local authorities can do to support/enable/build resilience (that is, not what others might do, nor what communities might do themselves). In other words, it is an empowerment model.

The model has drawn on WREMO's community-driven 'iceberg' model (see Figure 4, page 23). It recognises that resilience is strongly driven at the level of households and businesses, connected communities and empowered communities. It also recognises that local authorities can support and provide an enabling environment in many ways. For example:

- *Prepared households and businesses*: supporting preparedness through awareness-building activities and opportunities to take action; and
- *Connected communities*: supporting and creating opportunities for community activity that builds trust and reciprocity.

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Figure 11. Roles of local authorities in resilience

The suggested new framework includes the WREMO model of 'bottom-up' community-driven resilience, and has added to it 'top-down' local authority risk management, that includes:

- *Governance of risk and resilience*: championing resilience; having a resilience strategy or high-level objectives, a risk management framework, robust organisational resilience, and a centralised understanding of city/district/regional risks that is used throughout the business; and

- *Risk-informed management*: managing assets, services, natural resources, spatial planning, urban design, and economic development, with risk and resilience objectives in mind.

In the centre of the model the yellow diamond shows a partnership between CDEM and empowered, resourced and strong communities, where local authorities' roles are:

- *Empowered communities*: building community capacity to resolve daily challenges and reduce risk through communication and collaboration; and
- *Supportive CDEM*: facilitating reduction, readiness, response, and recovery activities for organisations and communities.

The model has grown from a comment made by a representative of one of the councils who participated in the webinar on 5 April 2016 that: "In reality, we have both 'bottom-up' community-driven resilience, and 'top-down' risk management".

In carrying out the above roles it is important that councils (elected members and staff) first understand the 'stressors' of their district, city or region and neighbouring authorities. This requires understanding the risks and hazards in their community's 'hazardscape' and collaboration between regional council, territorial local authorities and iwi. It should involve RMA planners, CDEM hazard analysts, consenting teams, district and river engineers, and lifelines teams.

Councils with small communities in remote rural areas face particular challenges. They face multiple hazards but have a low rating base with which to fund their infrastructure. The leadership that councils provide to achieve resilience is particularly important in those communities.

It should also be recognised that while the model shows resilience is bottom-up driven at the community level, and local authority risk management is top-down driven, there are other roles that local authorities play to enhance a resilient system/society. For example, local authorities create an enabling environment for business which contributes to economic development; local authorities are responsible for environmental policies, plans and initiatives such as RMA regional and district plans, clean air policies, and climate change action plans, which contribute to environmental sustainability and resilience; and local authorities strengthen CDEM lifelines utilities groups, and healthy/safer cities programmes support community resilience.

The model in Figure 11 includes CDEM's role. It also allows for resilience in the face of chronic stresses which may not involve CDEM directly, except where the chronic stress may lead to an emergency shock.

Of course, local authorities' role depends for success on collaboration with many sectors and agencies, which is discussed in the next section.

15. Collaboration with other sectors and agencies

Resilience requires collaborative action between all sectors and agencies. This covers local authorities, government agencies (eg MCDEM, DPMC and National Infrastructure Unit in Treasury), business, infrastructure providers, community, iwi, social sector agencies (eg NGOs, MSD, District Health Boards) and science/research agencies (eg CRIs). Figure 11 has been developed to show the role of local authorities in resilience. The concept could also be used to show how any organisation or sector (for example, government, business, social sector, or science/research institutes) contributes to resilience. The green part of the diagram representing community-driven resilience stays more or less the same, but the blue part (and all the small text) changes to tailor it to the organisation or sector. To illustrate this, Figure 12 shows how the contribution of all sectors could be recognised and integrated to achieve resilience.

This would include recognition of the role of 'New Zealand Inc' or a joined up all-of-government approach at the national level, as the strategic enabler (provider of national direction, support, systems and tools). To be effective, the relationship between central and local government should be a strategic partnership of collaboration, not just consultation. Local government is the natural fit for the role of resilience champion at the regional, city/district level, encouraging collaboration between all organisations.

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Figure 12. Proposed model to show collaboration between all sectors to achieve resilience To give an example where collaboration is vital, WREMO is developing a Pre-Disaster Recovery Framework. This could be a key to achieving resilience if the knowledge is applied in an integrated and holistic way, across all sectors.

Another example is the considerable work from Crown Research Institutes (CRIs) and universities in the name of resilience. However, much of this is disconnected from local government, the 'owners' of the risk from natural hazards. Local government should be calling for the effort to be joined up with the need, through commissioning the science. SOLGM should discuss this with the CRIs such as GNS Science.

Resilient New Zealand is a group of business and NGO organisations comprising Beca, BNZ, IAG, Red Cross and Vodafone. It has produced a report 'Contributing More: Improving the Role of Business in Recovery', with recommendations which are: "starting points for collaboration between government, local government, NGOs, industry bodies and businesses to identify and develop ways to build resilience and effectiveness in recovery"⁴¹. The recommendations include:

- Be proactive
- Improve risk management
- Strengthen disaster plans
- Invest in agility
- Build relationships and networks
- Plan to strengthen community resilience
- Focus on recovery in Civil Defence Emergency Management
- Develop a national blueprint for major disaster recovery

15. Conclusions and Recommendations

Conclusions

1. 'Resilience' has been defined as 'what enables people to survive, adapt and thrive in the face of shocks and chronic stresses'. 'Shocks' include storms, floods, droughts, earthquakes or volcanoes. 'Chronic stresses' encompass economic downturns with impact on survival of businesses and employment; negative social conditions such as long-term effects of crime, child abuse, family violence, obesity or racism; long-term demographic change such as a declining population and a limited rating base; climate change impacts of sea level rise and greater frequency of storms and droughts.

2. There are demonstrable, practical and financial benefits to councils in taking a strong leadership role in resilience. They include:

- Ensuring the safety and wellbeing of their communities;
- Enabling the sustainability of their district, city or region; and
- Saving money in future Long-term Plans, through investment decisions now that avoid or mitigate future costs of short-sighted infrastructure or land use decisions, or the major costs of recovery from shock events; and through empowering communities to greater self-reliance.

⁴¹ Resilient New Zealand (2015) *Contributing More: Improving the Role of Business in Recovery*, www.resilientnewzealand.co.nz

3. Resilience includes both:

- Planned risk management such as organisational risk frameworks, business continuity, financial risk management, risk-informed management of assets including infrastructure, natural resources and environmental plans, regional spatial planning, RMA regional and district plans, urban design and economic development. This involves planning for 'known knowns'⁴², where variability can be readily described, and 'known unknowns', where there are limitations on information and assumptions have to be made; and
 - Adaptive capacity, which is the capacity of people, communities and systems to adapt in the face of unpredictable change. This comprises 'unknown unknowns', such as risks in complex systems with dynamic interdependencies. Actions required are building organisational and community capability, through leadership and culture, networks and relationships, and being change-ready.
4. The two elements of resilience, 'planned risk management' and 'adaptive capacity', are both vitally important:
- The LGNZ initiative to establish a Local Government Risk Management Agency (LGRA) has a primary focus on the 'planned risk management' element of resilience. From a community perspective, resilience cannot happen if local authorities have not prepared the foundations well: the infrastructure must be in place. Community resilience is an outcome of good risk management as it relates to New Zealand's natural hazard environment and infrastructure. These are the basic services that sustain people and communities, subject to the rate-payers' willingness to fund them; and
 - The SOLGM initiative to commission this report on Building Community Resilience has a primary focus on the 'adaptive capacity' element of resilience. This recognises the international trend to see communities as open systems, with the wider definition of resilience as the adaptive capacity of a community to survive, adapt and thrive in the face of complex and unpredictable change.

These two elements of resilience are essential parts of the whole, and the initiatives by LGNZ and SOLGM are therefore mutually reinforcing.

⁴² Webster, J (2013) *Understanding the Cynefin framework – a basic intro.*, September 29
<http://www.everydaykanban.com/2013/09/29/understanding-the-cynefin-framework/>

5. The Ministry of Civil Defence Emergency Management (MCDEM) is reviewing the current *National Civil Defence Emergency Management Strategy*, based on the 4Rs: Reduction, Readiness, Response, and Recovery, with a vision of a 'Resilient New Zealand'. A new *National Disaster Resilience Strategy* is being developed. MCDEM has already signalled that this will reflect New Zealand's commitment to the 'Sendai Framework for Disaster Reduction , 2015 – 2030' and will require a shift to 'manage risks' from 'manage disasters'. This demands prepared households and businesses, connected and empowered communities and a supportive CDEM structure. Work on this should also be seamlessly integrated with the local government initiatives on resilience described in 4, above.

Recommendations

My recommendations focus on Figure 11, Roles of local authorities in resilience. These proposed roles are crucial in achieving resilient neighbourhoods, communities, districts/cities/regions, and a resilient nation. Figure 11 reflects that LGNZ's *Local Government Risk Management Agency* initiative (with a focus on the functions in the upper triangle) and this SOLGM *Community Resilience* initiative (with a focus on the functions in the lower triangle) are mutually reinforcing.

I propose that SOLGM make the following recommendations for discussion to the councils and chief executives of all local authorities in New Zealand:

1. That all local authorities prepare comprehensive enterprise risk management plans (with their CCOs), including:
 - Understanding their risks: hazards, stresses and shocks, exposure of assets, and vulnerabilities of their communities and people.
 - Reducing existing risks: reducing hazards, reducing exposure and vulnerability, incentivising investment in risk reduction, risk transfer and insurance.
 - Minimising the creation of new risk: risk forecasting, modelling and assessment, standards, codes and practices, and incentivising resilient development (for example, climate change adaptation through land use provisions under RMA district plans that take account of projected sea level rise).
 - Strengthened resilience: business continuity plans, building adaptive capacity, readiness for response, and creating the environment for effective recovery and to build back better.
 - Working together: governance, inclusiveness, improving connectedness through networks, partnerships, co-benefits and co-creation, outreach and facilitating uptake.

2. That all local authorities take on the role of champions of resilience with their communities, districts/cities/regions, including working collaboratively with government agencies, business and infrastructure providers, communities and civil society, iwi, social sector and science/research institutes.
3. That all local authorities implement the proposed model of community resilience and local authority risk management in Figure 11 including:
 - i) governance of risk and resilience: having a resilience strategy or high-level objectives, a risk management framework, robust organisational resilience (that is, get their own house in order), and a centralised understanding of city/district/regional risks that is used throughout the business.
 - ii) risk-informed management: ensure that they build resilience objectives and capability into managing assets and infrastructure, services, natural resources, spatial planning, urban design, and economic development.
 - iii) ensure there is a supportive CDEM organisation: facilitating reduction, readiness, response and recovery activities for organisations and communities.
 - iv) build adaptive capacity through empowered communities: building community capacity to resolve daily challenges and reduce risk through communication and collaboration.
 - v) provide for connected neighbours and communities through supporting and creating opportunities for community activity that build trust and reciprocity.
 - vi) support prepared households and businesses: preparedness through awareness-building activities and opportunities to take action.

Future Work

My recommendations for follow-up work to this report are:

1. SOLGM and LGNZ discuss how to ensure this work on Resilience and the work on the LGRA is seamlessly integrated and mutually reinforcing.
2. Subject to 1 above, the follow-up work is:
 - This report is circulated to all councils and local authority chief executives, with an invitation to comment on the report, and in particular the proposed model in Figure 11 and the three recommendations above.
 - The feedback on the report from councils/chief executives is discussed between SOLGM and LGNZ, and the follow-up action on the report is agreed between SOLGM and LGNZ.

- The proposed model in Figure 11, Roles of Local Authorities in Resilience, as it may be amended following feedback from councils/ chief executives, is then jointly (SOLGM and LGNZ) discussed with MCDEM to seek agreement on how this is presented in the *National Disaster Resilience Strategy*.
- SOLGM and LGNZ convene a meeting with other sector representatives including government (MCDEM, National Infrastructure Unit, Treasury), business and infrastructure providers (Resilient New Zealand, New Zealand Council for Infrastructure Development), community and civil society (Red Cross), iwi, social sector (MSD, DHB), science/research (GNS Science), to talk about the opportunity for better integration of the contribution that each sector could make to resilience.
- Further work is done, using case studies showing how the concepts of resilience have been operationalized, as a useful practical guide to local authorities on implementing resilience (feedback during this report has been that such a practical guide would be helpful to local authorities, and the preparation should engage stakeholders who have practical experience of resilience).

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