Fit-for-purpose Resilience in Aotearoa New Zealand: Challenges and Recommendations

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1 Executive Summary

The question of how organisations design and implement appropriate and effective resilience strategies for different stresses (e.g. sea-level rise), shocks (e.g. earthquakes) and contexts is attracting great interest. In this report we investigate issues connected to fit-for-purpose resilience in Aotearoa New Zealand by examining Rockefeller 100RC frameworks and interviewing policy and practice experts. Despite many organisations developing strategies to enhance resilience, we reveal a contradiction between the multi-dimensional resilience often talked about by researchers, and the uni-dimensional resilience that dominates practice. By understanding the reasons underlying this contradiction, we can better enable fit-for-purpose resilience responses more suited for addressing different stresses, shocks and contexts. The key challenges include:

- Institutional funding models do not tend to support a long-term focus, such as financing long-term climate resilient development pathways. Thus, prevailing resilience strategies favour shorter-term stability outcomes rather than adaptation or transformation – even when prevailing strategies are recognized as being ‘non-resilient’.

- While the need to ‘put people at the centre’ of resilience is widely accepted it is hard to operationalise, especially in addressing root causes and drivers of vulnerability. Furthermore, norms of funding, capacity, and expertise are seldom tailored to allow the deeper collaboration and engagement necessary for resilience-building and more transformative change.

- Resilience strategies associated with emergency response or maintenance of business-as-usual more closely align with operational norms and are seen as politically safer than more adaptive or transformative measures. Actors cite siloed information and legislation, weak central government direction, and a

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1 Aotearoa New Zealand acknowledges postcolonial heritage. We then abbreviate to Aotearoa across the rest of the report.
lack of government backing to support those resilience strategies designed to address uncertain, long-term or difficult decisions.

- Many resilience strategies lack the required practical action points to deliver effective change, and instead advocate resilience as a vague, aspirational goal. Measuring resilience was also considered to be generally unhelpful, due to the selectivity of data, the individual nature of the subject matter and the ways that it steered resilience strategies toward quantifiable logics that typically reinforce business as usual.

In revealing these findings, this research highlights how institutions and organisations aiming to deliver stress-, shock- and context-relevant resilience strategies need to carefully examine and address the ways that their structures, norms, practices and capacities privilege their ability to cope over the ability to adapt or change.

2 Overview

In this report we investigate issues connected to fit-for-purpose resilience in Aotearoa. The report begins by outlining the dimensions of resilience, tracing how resilience was tied to ecology, but has been adapted over time to include sociological aspects and geographical contexts. The resilience setting in Aotearoa is then overviewed as the country faces a unique suite of hazards which are likely to be exacerbated by climate change. Next the methods are outlined. The scoping phase began broadly, then paid deeper attention to the Rockefeller 100 Resilience Cities framework to examine resilience projects currently initiated in Wellington and Christchurch. The findings for this phase outlined a predominance of “absorb”-type responses. In phase two, empirical data was sought and semi-structured interviews were conducted with 23 experts. Data was triangulated to help understand why certain types of resilience are delivered more easily in Aotearoa. The report concludes with recommendations on how a more fit-for-purpose resilience may be achieved.
2.1 The Dimensions of Resilience

Given the significant threats of climate change and natural hazards, and the complex and unpredictable ways they interact with society, the question of how to build resilience attracts great interest. Originally developed as an ecological concept (see Holling 1973), resilience has been adapted over time to become associated with the integration of social and ecological systems (Adger 1997; Folke 2006; Berkes et al. 2003). Resilience is, however, notoriously difficult to define and can mean different things to different people. In part, this is due to the involvement of different disciplines and research traditions. For example, Zhou et al. (2010, 23-24) list 28 diverse definitions of resilience from Holling’s work in 1973 where resilience is defined as the: ‘amount of disturbance that can be sustained by a system before a change in system control or structure occurs’; to Pelling’s in 2003: ‘the ability of an actor to cope with or adapt to hazard stress’; to Aguirre’s 2006 definition: ‘a resilient social entity absorbs, responds and recovers from the shock; and improvises and innovates in response to disturbances’. The authors also outline four distinct themes in resilience studies; ‘resilience as a biophysical attribute, a social attribute, a social-ecological system (SES) attribute, and an attribute of specific areas’ (see Zhou et al. 2010, 22-26).

Authors (e.g. Davoudi, 2012; White and O’Hare, 2014) also help to provide clarity by identifying the differing dimensions of resilience and the different outcomes each provides. These encompass three areas: coping and recovery (stability and bouncing back); adapting within a system (marginal adjustments); or more transformative changes (system change). Each may be appropriate depending upon the nature of the problem, each may need different actors and agencies involved, and each present diverse issues for those aiming to translate the concept into practice. It is critical that the institutions that shape resilience strategies are fit-for-purpose, that is, the severity of shock or stress is matched to the focus of response (see Figure 1).
Figure 1: A resilience governance heuristic.
Source: Glavovic, White, Lawrence and Schneider, forthcoming, pp.5.

Figure 1 highlights the importance of governance and brings to the fore the related questions of resilience to what, for whom, why, where, when and how? We can also begin to reflect upon whether our responses are fit for purpose, or, put differently, are we delivering some types of resilience more easily than others? These kinds of questions are related to governance; the ways by which differing actors and agencies, whether formal or informal, or public or private sector, make decisions that affect society.
2.2 The Resilience Context in Aotearoa

The national and cultural context is important to this discussion. Aotearoa has a complex suite of natural hazard shocks evidenced by flooding, earthquakes, volcanoes, and landslides. These are being exacerbated by stresses like climate change, and some new hazards are emerging, such as rising ground water tables as sea-levels rise. As a consequence resilience has been, first and foremost, tied to disaster risk, response and recovery rather than, being embedded in climate change discourse. This has implications for delivery or operationalization of resilience strategies. For example, researchers reveal that the kinds of disciplines and experts involved in enacting resilience from this traditional hazard response perspective tend to be civil and technical engineers, civil defence emergency management teams, and infrastructure experts (see Lawrence et al. 2013; Lawrence and Saunders 2017), the institutional responses tend to be reactive rather than proactive and anticipatory (Boston 2017; Boston and Lawrence 2018; White and Haughton, 2017), and responses have been predominantly geared towards structural protection and driven off quantitative modelling, which is difficult to apply to many social concerns that shape vulnerability and resilience (see Cote & Nightingale 2011).

In contrast to ‘tame’ problems that lend themselves to traditional responses, climate change stressors presents a complex set of challenges for decision-makers because it is an ongoing process with both long- and short-term disturbances. It also includes uncertainty, variability and the need for anticipation of likely effects (Bell et al. 2017). Within traditional hazard and disaster risk reduction framing, emphasis is placed on enhancing the capacity of cities, infrastructure systems, and urban populations and communities to quickly and effectively recover from both natural and human-made hazards. The narrative of risks, responses, and responsible agencies, bolstered by catastrophic earthquakes sequences in Christchurch and Kaikoura in the past decade, has helped continue the dominance of engineered solutions to addressing technological problems. Technological solutions, such as flood defences, are
considered to be permanent solutions, when in reality they may increase long-term exposure to hazards by instilling a false sense of security on those ‘protected’ and increasing development opportunities. The remaining residual risk cannot be entirely mitigated and may increase in a changing climate. Each technological solution has a set life-span and performance criteria that may not necessarily match well with the changing nature of hazards and risks under climate change. Technocentric ways of operating, including the rational ordering of resilient objectives, mean that attention is paid to technical ways of knowing and seeing which prefer relatively predictable outcomes (Aldunce et al. 2014; Brown 2012; Tierney 2015; Haughton and White, 2017). For instance, Schneider, Glavovic & Farelly (2017) reveal community narratives on climate change impacts in two coastal communities in Aotearoa, arguing that: ‘despite laudable regulatory provisions, static responses to dynamic risks prevail and proactive adaptation is absent’ (2017, 1). Improved understanding of cultural-social ecological characteristics and capability building is needed to aid proactive adaptation and resilience-building.

The general mandate to ‘put people at the centre’ of resilience-building has a high profile in resilience literature, whether relating to disasters (Manyena 2006); post-disaster recovery (Campanella 2006); housing (Schilderman & Lyons 2011); infrastructure (Boin & McConnell 2007); organisations (Seville et al. 2008); or climate change stressors (Ministry for the Environment 2017). It is widely accepted that this empowers citizens and strengthens their capabilities, is positively associated with ethical issues associated with trust, accountability, and responsibility, and acknowledges that increasing risk profiles means that decisions will have a long-lasting effect on communities in the future. Set against this responsibility to make decisions on future risks is a political environment that has multiple competing agendas, funding streams and varied implications for the vulnerability of individuals, communities and wider society (O’Hare and White, 2017). Institutional norms and rules influence the logics of decision makers who also need to engage with contending
‘facts’ and ‘values’, or lack of certainty and consensus, when considering risk and resilience. This is apparent when climate resilience is being discussed because of the long timeframes of decisions that will be affected by increasing and changing risk profiles. In the absence of clear direction of agreement, the divergent political priorities of those in power are reflected through the ‘facts - values’ dichotomy, with facts traditionally promoted over values in evidence-based public policy (see Deyle & Butler 2013). However, risk analysts recognise both the fact-laden and value-laden nature of risk and argue that both perspectives need to be taken into account (Hansson 2010). This discussion highlights the need to pay particular attention to the important but often hidden role that authorities play in framing and designing resilience projects and strategies, and by extension resilience outcomes. As Swanstrom (2008, 16) puts it: ‘Resilience is shaped by laws, policies and very human institutions’.

To return to our opening discussion of ‘fit-for-purpose resilience’, this section emphasises the need to reflect upon the extent to which institutions are able to complement the more technical and short-term resilience responses centred on the ability to cope, with more flexible or agile responses that can address the uncertainties associated with impacts of climate change.

3 Methods

The initial scoping phase of the project captured details relating to a broad range of resilience policies, plans and responses that have been initiated across Aotearoa. We then used the resilience heuristic in Figure 1 to help build up an overview of; the various project aims, types of resilience they aim to achieve, how they mean to do it, and what success might look like. The heuristic is essentially an analytical tool to bring to light the stated values and outcomes within resilience projects and to contrast these with the approaches and delivery modalities used in practice. Used in this strategic way, the heuristic framework also enables insights about the overall balance of resilience initiatives within a wider portfolio of projects.
The Rockefeller 100RC City Resilience Framework was then selected because Aotearoa has Wellington and Christchurch that are part of the Rockefeller 100RC network. This enabled us to map resilience projects and potential outcomes at the city scale. Under the Rockefeller framework for Wellington, the strategy was developed through a series of ten workshops between June 2016 and March 2017 with different sectors including infrastructure groups, community groups and NGO’s using an ‘ideation generation’ method. Out of 600 ideas, 30 were put through resilience filters and form the basis of the current strategy. The 30 initiatives are the result of a combination of public consultation and engagement with over 200 people including infrastructure managers, researchers, community members, insurance, business and council staff across the wider region (for a full list see Wellington Resilience Strategy 2017, 109-115).

The aim was to use the heuristic tool (see Figure 1) to help reveal the influence of institutional processes, and start to gain insights into what types of resilience were being delivered and why. This data was collated into a table with each of the 30 programmes grouped according to: programme description; responses; resilience co-benefits; sector links; and type of resilience. The Christchurch 100RC framework was also assessed in the same way in order to compare the two projects, city specific risks and strategies in response. This stage was useful in providing a strategic overview of which resilience projects are being delivered. However, to investigate issues like why and identify implementation constraints, we needed to delve deeper and discuss with the actors and agencies involved with resilience more broadly.

As such, for the second phase of the project, we conducted twenty-three interviews with people working in the field of resilience. To get a wide view beyond the 100RC frameworks, the sampling strategy included people across Aotearoa with experience of community recovery, infrastructure, economic, organisational and natural hazard resilience, government personnel, consultants and utilities staff (see Table 1). The interviews were conducted between December 2018 and April 2019. Participants were
contacted by utilising professional connections and the snowballing technique (see Noy 2008).

<table>
<thead>
<tr>
<th>Professional field related to resilience</th>
<th>Number of interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities/Infrastructure (Engineering background) NZTA/CDEM/Lifelines</td>
<td>9</td>
</tr>
<tr>
<td>Geo-technical engineers/scientists (Climate science)</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
</tr>
<tr>
<td>Local and central government (MoE) (Operations and strategy)</td>
<td>2</td>
</tr>
<tr>
<td>Community development/social housing</td>
<td>5</td>
</tr>
<tr>
<td>Organisation/business/economic (Risk management)</td>
<td>2</td>
</tr>
<tr>
<td>Planning (PhD Engineering)</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

Table 1: Interviewee fields of expertise and numbers

The interview questions had four foci to help illuminate what types of resilience are being delivered and why:

1. The **characteristics of the stress and shock**, for example, slow onset or sudden stress/stock impacts.

2. The **intersection of facts and values** that structure how problems are perceived to reveal relationships between governance actors and any divergent or aligned values and interests.

3. The **structural dimensions of governance**, the institutional (norms and rules), political and/or technical factors that affect project design, and shape the ways in which decisions are made and actioned within a given project.

4. The **nature and evolution of resilience responses**, to gauge the learning and the integration of resilience within practice and its translation within projects.

Interviews were recorded and transcribed verbatim and analysed thematically (see Fereday and Muir-Cochrane 2006). Analysis of the interview data focused on ascertaining findings on the governance forces which shape resilience outcomes. A
final synthesis and thematic workshop was held with researchers from the Governance theme of Resilience to Nature’s Challenges National Science Challenge on the 8th March 2019 at the University of Waikato.

4 Which resilience projects are delivered in Aotearoa

4.1 Phase One: Scoping

In the first phase several issues of note emerged. First, in practice many initiatives lacked basic information, such as a clear definition of what resilience is defined as, how it might be implemented, or what the desired outcomes were. Second, specific implementation steps were largely missing and actionable processes typically vague or undefined. Third, resilience projects in the 100RC strategy varied markedly in scope, scale and output, making comparisons difficult. Lastly, many projects (i.e. 13 out of 30 actions for Wellington 100RC and 16 out of 25 actions for Christchurch) were either existing projects newly rebranded as ‘resilience’ under the strategy or a ‘scaling-up’ of what was already in place. As an indication, Table 2 and Table 3 provides a brief overview of the Wellington and Christchurch 100RC projects, a short description of the approach, and whether it is new or a scaling up of existing work.

<table>
<thead>
<tr>
<th>Resilience actions – 100RC Wellington</th>
<th>Description/approach</th>
<th>New or existing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve access to household resilience items</td>
<td>Education programmes, services and products</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Prepare for aging population</td>
<td>Symposia, loneliness survey to create index and mapping services for aged pop.</td>
<td>New project</td>
</tr>
<tr>
<td>Reduce homelessness</td>
<td>Te Mahana strategy investment</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Help communities build resilience</td>
<td>Regional and central city projects e.g. #wellynextdoor</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Support community spaces in taking on wellbeing and post-disaster roles</td>
<td>Re-vamp social spaces to incl. food production, shelter, water sources etc.</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Develop sustainable food networks</td>
<td>Connect and bolster current urban agriculture plans</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Develop disaster risk management plans for heritage areas</td>
<td>Inclusive management of heritage buildings</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Increase economic resilience of central city and outside hubs</td>
<td>Set of recommendations on vulnerability reduction; economic generation in hubs</td>
<td>New Project</td>
</tr>
<tr>
<td>Initiative</td>
<td>Description</td>
<td>Status</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>Help improve business continuity planning</td>
<td>WREMO business continuity including insurance</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Improve understanding of workforce trends</td>
<td>Diversification of economy</td>
<td>New Project</td>
</tr>
<tr>
<td>Introduce regulatory tools (including enforcement for resilience)</td>
<td>Assess regulatory responses to the impacts of SLR, earthquake, liquefaction, &amp; tsunami</td>
<td>New Project</td>
</tr>
<tr>
<td>Review Wellington Lifelines Group</td>
<td>Awareness of effect on communities of vulnerabilities in lifelines</td>
<td>Existing regional project</td>
</tr>
<tr>
<td>Maintain monitoring and evaluation of resilience goals</td>
<td>Resilient Wellington Steering Group</td>
<td>New initiative</td>
</tr>
<tr>
<td>Give Wellingtonians information to make decisions</td>
<td>Hazards information, Service connection &amp; opportunities, Virtual collaboration</td>
<td>Existing project</td>
</tr>
<tr>
<td>Virtual reality model of central city</td>
<td>Simulations of SLR 3D/VR model earthquakes</td>
<td>New project</td>
</tr>
<tr>
<td>Adaptation plan – comms &amp; engagement</td>
<td>Wellington city project SLR plan</td>
<td>New project</td>
</tr>
<tr>
<td>Encourage climate adaptation plans</td>
<td>Low carbon challenge Climate Change communication</td>
<td>Existing project</td>
</tr>
<tr>
<td>Recovery planning</td>
<td>WREMO, Communicate risks</td>
<td>New Regional project</td>
</tr>
<tr>
<td>Post-earthquake housing study</td>
<td>WREMO Assess gaps in capacity</td>
<td>New Regional project</td>
</tr>
<tr>
<td>Help make homes warm, safe &amp; dry</td>
<td>Investigate regulatory options for improving housing resilience</td>
<td>New project</td>
</tr>
<tr>
<td>Support insurance literacy campaign</td>
<td>ICNZ awareness of gap between assumption &amp; reality</td>
<td>New regional project</td>
</tr>
<tr>
<td>Understand scale on non-weather-tight homes</td>
<td>Targeted analysis of housing stock</td>
<td>New project</td>
</tr>
<tr>
<td>Assess the capacity for large-scale remote working</td>
<td>Assess telecoms ability to support remote working</td>
<td>New project</td>
</tr>
<tr>
<td>Improve water systems through ecological interventions</td>
<td>Cost/benefit analysis of ecologically enhanced water systems</td>
<td>New project</td>
</tr>
<tr>
<td>Explore options for sewage sludge disposal</td>
<td>Possible energy production</td>
<td>New project</td>
</tr>
<tr>
<td>Ensure emergency water supply</td>
<td>Delivery method investigation emergency water supply to key stakeholders</td>
<td>Existing project</td>
</tr>
<tr>
<td>Invest in water and wastewater resilience &amp; awareness</td>
<td>Accelerated investment programme</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Support flexible energy supply</td>
<td>Investigate incentivising uptake of tech for household energy independence</td>
<td>New project</td>
</tr>
<tr>
<td>Support widespread adoption of EV’s</td>
<td>Priority to contractors who use EV’s supported through district plan &amp; charging infrastructure implementation</td>
<td>New project</td>
</tr>
<tr>
<td>Leverage transport investment</td>
<td>Advisory project. Council as resilience champion &amp; active partner to reduce transport vulnerability</td>
<td>Existing project</td>
</tr>
</tbody>
</table>

Table 2: Overview of the resilience initiatives in the Wellington 100RC framework
<table>
<thead>
<tr>
<th>Resilience actions- 100RC Christchurch</th>
<th>Description/ approach</th>
<th>New or existing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop events/resources to help new residents connect</td>
<td>Increase levels of community engagement across Greater CC</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Improve support programmes for vulnerable people</td>
<td>Mental health support; psychosocial initiatives</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Consolidate and enhance network of local centres</td>
<td>Local councils to develop plans and encourage investment</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Promote transport alternatives</td>
<td>Greater access to variety of travel options</td>
<td>New Project</td>
</tr>
<tr>
<td>Community collaboration for healthy, safe facilities/places</td>
<td>Extension of community-led initiatives invest funding</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Improve quality of new and existing housing</td>
<td>Design and retrofit better quality forms of housing</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Develop a consistent source of housing research</td>
<td>Proactive planning, market assessment and policy focus</td>
<td>New project</td>
</tr>
<tr>
<td>Experiment with alternative forms of public participation</td>
<td>Create best practice with community engagement</td>
<td>New Project</td>
</tr>
<tr>
<td>Examine admin and regulatory processes</td>
<td>Simplify bureaucratic processes, training and capability of community leads</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Efficient use of resources, networking in communities</td>
<td>Data-base production, encourage collaboration</td>
<td>New Project</td>
</tr>
<tr>
<td>Funding for investment confidence</td>
<td>Investment in staff, assets and business resources</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Strong national and international connections</td>
<td>Develop marketing initiatives for overseas investors</td>
<td>New Project</td>
</tr>
<tr>
<td>Future proof physical infrastructure</td>
<td>Port and airport upgrade and recovery, invest in digital capacity</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Attract and retain overseas workers</td>
<td>Post-rebuild interest in CC, align edu/business skills</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Diversify economy, value-added production</td>
<td>Increase diversity of employment, research capabilities, increase wages</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Research and review global/technical trends</td>
<td>Future-proof investment in innovation</td>
<td>New project</td>
</tr>
<tr>
<td>Support social enterprise in driving change in community</td>
<td>Evolution of public services in not-for-profit sector</td>
<td>Existing project</td>
</tr>
<tr>
<td>Build sustainable food networks</td>
<td>Increase community gardens, support local food chains</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Restoration of indigenous biodiversity</td>
<td>Establish partnerships to drive sustainable ecological network</td>
<td>New Project</td>
</tr>
<tr>
<td>Agree objective risk evidence, communicate to communities</td>
<td>Continue to develop objective base of evidence to communicate to community</td>
<td>Existing project</td>
</tr>
<tr>
<td>Explore risk scenarios to inform risk reduction</td>
<td>Understand what risk management and risk acceptance are</td>
<td>Scaling-up</td>
</tr>
<tr>
<td>Develop risk reduction framework</td>
<td>Council/government implement regulation and manage risks</td>
<td>New Project</td>
</tr>
<tr>
<td>Review role of insurance as a tool for risk transfer</td>
<td>Inform risk mitigation and risk transfer for affordable premiums</td>
<td>Existing project</td>
</tr>
<tr>
<td>Community preparedness and risk acceptance/response</td>
<td>CD advice, encourage communities to get involved with planning for disruption</td>
<td>Scaling-up</td>
</tr>
</tbody>
</table>
Securing a future in eastern Christchurch
Meeting point of all goals above to support eastern CC

Table 3: Overview of the resilience initiatives in the Christchurch 100RC framework

Comparing the two tables, the suite of resilience initiatives for Wellington are loosely based around adaptation planning and infrastructure, whereas, Christchurch’s resilience projects are embedded in recovery and risk. Of the 25 new projects across both strategies, many linked to ‘absorb’, or ‘business-as-usual’ type resilience, which provides insights into what sorts of actors were working on projects connected to the 100RC strategy and aspects such as institutional logics. Key findings from this phase included:

- where we were able to easily interpret project goals to resilience types, there was a clear focus on “absorb” responses;
- the balance of the projects were significantly focused on business continuity / economic resilience areas, and the goals tended towards self-sufficiency and enabling other actors to take more responsibility for being resilient;
- actors in councils, government agencies, housing developers, and community organisations predominately design the projects.

We now turn to why the resilience projects tended toward either business-as-usual or absorb-type resilience responses. The evidence behind this finding was revealed by drilling down into key informant responses and provides clarity and rich detail on the factors that impact resilience approaches and outcomes.

5 Defining Resilience

While the popularity of resilience as a framing concept for managing shocks and stresses has grown in academic, policy, and practice contexts, there is also a burgeoning body of thought on the gaps in, and potential pitfalls of, resilience as a managerial tool. For example, these critiques highlight the vague treatment of the term, a lack of direction given to resilience outcomes, a failure to address trade-offs, and its epistemological bias towards technical responses (Béné et al. 2012; Cannon & Muller-
Mahn 2010; Duit, Galaz, & Eckerberg 2010). A key recurring message is that it is important to acknowledge the ambiguity of the term resilience, and clarify what is meant by it, and what it can achieve (see also Matyas & Pelling 2014; Zhou et al. 2010). Issues connected to ambiguous terminology, and its translation to institutional practices was recognised by a number of interviewees. For example, one respondent outlined that the link to ecology was seen as problematic when addressed in the context of slowly evolving hazards or stresses, and stated that:

The problem with resilience terminology is because it sprung out of the ecological sciences. Resilience in ecological terms is effectively a spring back, a rebound which is fine if you’re dealing with a shock, a one-off event or an event with frequency which can be relatively predicted, or has a long return period. But with slow onset impacts of climate change a rebound is a dangerous concept, because we need to be more transformative. Do we need to rebound to what was? (Interview 2.4.19)

Other interviewees similarly grappled with the term and the related terminology and its application. Participants frequently argued that resilience was too broad to be usefully defined. Many asked; what is it? What do you mean by it? Who has it? Who doesn’t have it? For instance: ‘Resilience means different things to different people and people tend to “cherry-pick” what they mean by it’ (Interview 22.2.19).

There were also stark differences between hazards, places, and people that serve to frame and reframe resilience definitions and terminology. For example, engineers tended to use a risk-based approach using likelihood and consequence assessments, even where climate change was involved and likelihoods could not be easily calculated due to uncertainties. Resilience was also linked to other terms which had an influence on framing and understanding, such as vulnerability, adaptive capacity, sustainability, acceptability, tolerability, risk, criticality, exposure, and sensitivity – many of which link to a natural hazards framing and a technocratic lens moulded by traditional responses to natural hazard risk.
Other respondents said that, given the definitional problems, when dealing with the public or communities, they avoided even using the term as it was not well received (especially in post-disaster Christchurch). Or resilience was not well understood outside of science and academia, or was interpreted as ‘policy-speak’ and therefore relegated to being ‘unhelpful’ (Interview 22.2.19). Other terms such as ‘well-being’ were becoming more commonly used instead.

This lack of shared understanding about the meaning of resilience might help explain why many respondents did not commit to a single definition of resilience but felt that it was a “good thing”, given its potential to enable communities to cope with shocks and navigate the uncertainty and complexity of longer-term stresses like climate change. There was also a general awareness that understandings of resilience were shaped by the organisations people were embedded in and that this in-turn had implications for the nature, purpose, implementation and outcomes of resilience projects. Issues which we now explore in more depth.

6 Why we deliver certain types of resilience: tabulated results

Interview data revealed six themes of interest:

(1) There is a natural disaster context in Aotearoa which shapes resilience framing, responses, and outcomes;

(2) Resilience projects and their outcomes are closely linked to institutional norms that predominantly promote short-term and largely technocratic protection-oriented responses;

(3) Funding further bolsters short term responses and longer term resilience-building projects are difficult to fund or are simply not funded;

(4) Measuring resilience also tends to link projects to existing pathways which reinforces business as usual responses;

(5) People-oriented resilience projects are harder to deliver and are seen as more politically risky; and,
(6) Resilience aspirations do not readily translate neatly into ‘actionable achievements’.

6.1 Aotearoa resilience is historically tied to natural disasters

Aotearoa has a complex suite of natural hazards evidenced by earthquake swarms in Christchurch and Kaikoura, but also include flooding, drought, volcanoes, and landslides. Given the country’s experience with natural hazards, especially over the last decade, this forms the basis of a strong discourse that affects resilience logics, such as risk-based assessment frameworks that are applicable to addressing sudden shock events but less suited to addressing stress-related long time spans, uncertain risks, and dynamic risk relations. Respondents argued that the legacy of natural hazards dominates the framing of resilience responses, as well as who is involved, and how action is taken. They explained:

In New Zealand we are very focused on hazards, we mainly deal with shocks and sudden events, that’s our core focus and framing of risks (Interview 8.2.19).

Resilience in New Zealand goes straight to natural disasters. Organisations will always talk about the hazard-scape and that being the most likely source of disruption. When we started research [post-Christchurch] we focused on disruption and getting through a crisis (Interview 6.3.19).

The focus on disaster risk drives a pathway towards those professions and disciplines that have historic agency in this regard, and the implementation of technocratic responses based in institutional norms, knowledge, and practices. For instance, in the predominant natural hazards framing of resilience, tolerability and acceptability are used as metrics to assess resilience. However, tolerability and acceptability point strongly toward absorb or stability types of resilience outcomes, because they are a snapshot in time based on perceptions of experienced risk by current generations. Measuring tolerability and acceptability in the natural hazards area inevitably defines what an acceptable level of risk might be, which will always be subjective because it is tied to current contexts and past experiences. For example, pre- and post-flood views of risk change dramatically with affected communities, even if the risk itself has
remained relatively static (see Kousky, Pratt & Zeckhauser (2010) for experience and non-experience of risk; Lawrence, Quade & Becker (2014) on flood risk perception in Aotearoa). Adding climate change to this risk matrix would affect the risk profile, changing the possibility, frequency and level of risk and therefore changing the perception and acceptability of risk.

6.2 Institutional norms drive short-term responses

There was perceived to be a lack of organisational capacity and funding for the longer timescales associated with engaging vulnerable populations on issues connected to climate change or attempting to deliver more people-centred resilience. This was often seen as a function of short political/electoral cycles, managerialism that seeks KPIs, and efficient expenditure and output delivery on a quarterly or annual basis. In short, a reason why the ‘business as usual’ types of resilience tends to be absorptive and short-term is, in part, driven by the disciplines, institutions, and funding timescales that relate to how it has historically been operationalised within institutions and their focus on sudden shock events. This is consistent with previous New Zealand-based research (for example, see Lawrence 2016). Respondents discussed timescale by commenting that:

The response to climate change involves a lot of the disaster resilience work that is related to more static hazards. But if you fail to take into account the changing nature of the risk over time; then your response will similarly fail (Interview 2.4.19).

It’s a combination of a) not knowing what you’re facing; b) thinking you can bail out; c) thinking that it’s never going to happen anyway; and d) thinking technology will save us. We struggle to look too far out because there are so many other things more immediate to deal with (Interview 2.4.19).

Climate change happens slowly so the biggest problem is that you often spend multiple government cycles and priorities change. For example, the current government is very much about putting community resilience back at the heart; the previous government was very much on building new structures and building their way out of some of these resilience challenges (Interview 9.4.19).
At a governance level one of the barriers [of addressing slowly evolving impacts] is the fact you’re going to have to engage in a very detailed way with constituents who are potentially affected so a lot of councillors are very hesitant to get into that space (Interview 11.4.19).

Resilience thus becomes subject to a gravitational pull towards existing ways of knowing and doing, which are more closely aligned with recovery, ‘absorb’- type resilience, or ‘business as usual’ responses. This framing focuses on risk assessments and infrastructure, which are, of course, only part of the suite of resilience options. Existing ways of knowing and doing fosters a tendency to fix up the damage *in situ* to get communities ‘back to normal’ and to reduce or manage the assessed risk in a locality. Interviewees repeatedly identified this issue as a problem for pursuing more social aspects of resilience or engaging with the longer timescales and more uncertain stresses and shocks associated with climate change. By promoting coping or ‘business as usual’ resilience responses in the post-event phases of natural hazards, it may even make places less resilient in the longer term in contrast to adaptations that could reduce vulnerability and avoid those damages in the future.

**6.3 Funding privileges short term technical responses**

A key finding was that funding was also skewed to short term technical responses to sudden events, e.g. tsunami early warning systems; stop-banks; sea-walls; evacuations; bolstering infrastructure; and protecting key utilities assets. As funding is moulded by institutional budgets, achievable actions located in current budget rounds are promoted over less defined responses to future risks. Climate change and slowly emerging impacts, therefore, are inherently harder to get economic (and political) buy-in.

It is worth mentioning that how the financial structure of public organisations is a barrier. Funding structures tend to support more towards a sudden event and there’s less stomach to put long term funding into looking at slow-onset change. Because the awareness and implications of that long-term are not well appraised in policy and political governance circles as well as the current insurance model doesn’t fit – it’s a bit of an uphill battle (Interview 11.4.19).
However, enhancing resilience has become a key element of preparedness for extreme events and stresses like climate change.

The constant challenge we have is a limited funding bucket, and something has to give. There is also a really big skew in funding, so for NZTA if something breaks and you wanted it fixed, you’d get 90% government funding assistance. But if you wanted to fix it proactively, you’d get 50% funding assistance, so why would you fix it before it happened? And from a political perspective, most politicians would like to build something than save something (Interview 9.4.19).

At the moment we’re [NZTA] relatively short term, 10 years, 20 years but we don’t think about sea-level rise and don’t build it into our thinking. We take an almost ‘we'll deal with it when it happens approach’. So, how do we change our funding model to allow us to think a bit more long-term? (Interview 9.4.19).

By and large it was argued that resilience initiatives that were not being funded tended toward a social framing of resilience, addressing social justice issues such as social housing, social recovery, homelessness, or age-concern (see Table 2). For example, projects focused on the latter two issues did not get funding or were abandoned in the 100 RC framework for city-wide resilience in Wellington (Interview 22.2.19).

Regarding social housing in particular, resilience is not something agencies hold providers accountable for when approving funding for projects. Rather it is about value for money in the short term:

When the government looks at funding applications, they put a weighting on value for money because there’s a limited pool of funding resources for social housing. They get that we want to provide affordable housing, but they don’t get the resilience. In the criteria in applications for our capital funding, I’d be confident in saying there’s no reference to resilience (Interview 23.1.19).

Resilience within organisations, as practiced by those who participated in this study, stresses the scientific, technical and rational, over the human and social. For example, it was explained that in Wellington the 100RC has allowed the Council to “leverage a whole bunch of science and engineering that otherwise we probably wouldn’t have” (Interview 22.2.19). However, a system emphasising social-technological-ecological processes fails to populate these systems with individuals. The complex realities of
how socioeconomic issues combine with ecological systems is not captured well by science and technological approaches.

6.4 Measurement is problematic

During interviews, the subject of measuring resilience and whether measuring can be useful was highlighted as another key issue. There were two differing conversations based around measurement and its efficacy. First, was selectivity, as some types of resilience were measured while others were not. Resilience initiatives that were measured were predominantly infrastructure-based projects, which were assessed in order to produce a cost/benefit analyses for decision-making or were driven by risk quantification. The consequence of linking measurement to risk/cost assessment means that projects may be directed down technical response pathways, this would not capture issues connected to communities with their diverse values and vulnerabilities (O’Hare and White, 2017). Measurement also has links with vulnerability discourse, especially in the community resilience lens. Many of the respondents also questioned the meaning of vulnerability in a resilience context, arguing that the two terms are allied and that vulnerability too was difficult to measure, especially when quantifying risk:

If risk assessment is conducted on two communities A and B, where A is classed as a lower socio-economic and a more vulnerable community than B, the risk would be more amplified because of their high vulnerability. So the council will then say, “I’ve got 100 million dollars to spend on an emergency water supply system, I am going to put it in Community A because they are higher risk”. But how have they defined vulnerability? Is it fair? Is Community A really more vulnerable? There’s a whole bunch of literature that says just because they’re poor, they might have better social connections. And that becomes really problematic very quickly (Interview 1.2.19).

Participants also explained:

There’s a whole bunch of literature that says poorer communities have better social connections, well that’s a big can of worms. When you start with subjective attributes that you’re trying to quantify, where does that lead you? We do these assessments in many cases to prioritise or rank something and make a decision.
And decision making tools are there to allocate spend and that’s when it can all grind to a halt (Interview 1.2.19).

The idea that you can monetise resilience is walking on thin ice in my view. The amount of effort that’s gone into cost-benefit analysis of investing in resilience initiatives is staggering and the amount of assumptions that go into coming up with a number is also staggering (Interview 1.2.19).

Metadata standards were rolled out nationally, but was not done collaboratively and just came out with a huge volume of standards and guidelines that were impractical. Volume two which covers risk, resilience, criticality, vulnerability and all these things, is in a completely invented language. So, some councils are now applying this, or are trying to and it’s not mandated, so it’s just a mess (Interview 1.2.19).

Consultants always try and compare cities, but every city is completely different. So, for my money there is not a lot of sense in comparing cities by trying to use a set of resilience metrics (Interview 22.2.19).

A lot of time and effort is wasted in trying to measure resilience. I do think it is useful to have some indicators, but a lot of people who like to do measuring and evaluating things try and design a framework that can, over time, measure a city’s progress. But actually when you think about people and climate change, it’s largely a waste of time... the only reason we care about any of this is because people living, working and playing in the city. So, it’s as much about attitude and culture as anything else, and like anything else, when you try and measure attitudes and cultures, you can do that using a satisfaction survey to reach as many people as we have [in Wellington]. But going anywhere beyond that is a sea of consultants and models which takes a crap load of input and then the output you get is bugger all (Interview 22.2.19).

6.5 People oriented resilience projects are harder to deliver

Interviewees agreed that while there was a clear mandate to ‘put people at the centre’ of resilience, people-oriented resilience projects were harder to deliver due to the rounds of engagement, length of process, and the lack of measureable outputs that decision makers preferred. Respondents explained that resilience initiatives ‘of all colours and stripes’ need to put people at the centre – linking to the Wellington 100RC project 12 – ‘Awareness of effect on communities of vulnerabilities in lifelines’ (see Table 2). It was positive that the value of putting people at the centre was taken as a given, often argued in research (e.g. Cannon & Muller-Mahn 2010; Kuhlicke 2013;
Smith & Stirling 2010), was widely acknowledged in practice, even by, for example, technical professions, such as these utilities technicians:

Resilience is about people. People and the resilience of infrastructures do have a link and we need our expert engineers to understand who is at the end of the power plug. For example, when we have outages there is an enormous impact on people who are dependent on power for medical support or those who might be economically or socially marginalised (Interview 11.1.19).

It doesn’t matter how robust or resilient your infrastructure is, it’s going to have an impact on people, so how do we enable communities to be more resilient? Without resilient communities there is little point to the work we [Lifeline Utilities Group] do (Interview 9.4.19).

The research findings suggest, however, that putting people at the centre was, in general, poorly actioned for three main reasons:

- Decision-makers adopted a top-down response to resilience and used ‘policy ready’ decisions in the short term with little ongoing community consultation, which resulted in actions not being followed up in an inclusive manner.
- Funding agencies have little financial and institutional backing for what they perceive as resource intensive lengthy processes that have no ‘measurable’ output or efficacy.
- Community resilience initiatives are heavily reliant on key actors who are (mostly) energised by response to adversity which cannot be sustained well in the long term and are often not welcome in risk adverse communities.

Interviewees recognised the gap between rhetoric and reality, and how ‘projects in community resilience are not getting funded, the community is frustrated and lessons are not getting written up or operationalised’ (Interview 22.2.19). This issue stimulated respondents to discuss how current funding and institutional arrangements require restructuring and the need for a culture of change that requires better communication and the development of trust across all institutions.

We’ve got to invest in having a conversation on what resilience means when people are at the centre. We’ve got to bring all the community together and
agencies with the power and control (i.e. money), and we’ve got to listen to each other and develop a new model, because the current model is not working (Interview 22.2.19).

Linking to this discussion, putting people at the centre requires investing in community and multi-stakeholder engagement, where there may be less control over outcomes. This shift in institutional norms is difficult to achieve and viewed as being potentially politically risky for decision makers who are responsible for budgets, or project management outcomes that demonstrate value for money within a set period.

In every council, decisions are signed off ultimately by elected members, and elected members like to get re-elected. They do that by not upsetting people and by not taking the steps they should be taking to prepare us for climate change (Interview 27.3.19).

We have the science, we have the knowledge [around risk assessment] but it’s not reflected in how we’re going to design our city because it’s not in the district plan... that takes a whole bunch of guts and political courage, through governance and accountability...we are trying to get our decision-makers to understand what the risks are and where they fit in and to understand that from a governance perspective they need to have the spine to make tough planning decisions for the future [of Wellington] (Interview 22.2.19).

The way land-use planning is legislated and implemented, and how councils all use different methods to implement their decisions was also seen as a constraint to achieving people-centred resilient outcomes. For instance:

We don’t have a consistent housing policy in New Zealand, especially how government partners with the community housing sector. We just lurch from one policy trial to another. And the resilience stuff gets lost in that ever-changing environment, you don’t actually know what the government’s priorities are (Interview 23.1.19).

There are concerns about the inconsistencies in the policy space. For example, the Building Act has a 50-year timeframe and the NZ Coastal Policy Statement has a 100 year time frame around land use. So when you put the building at 50 years and the land use at 100 years there’s an immediate disconnect (Interview 11.4.19).
6.6 Strategy without implementation?

It was often noted by respondents that there are glossy publications with resilience metrics and framing that achieve little, because they are not directly linked to action points (i.e. the Rockefeller 100RC and the National Disaster Resilience Strategy was cited).

Resilience strategies can very quickly deteriorate into getting a report out that’s all glossy and everyone signs off on, but nothing actually happens (Interview 1.2.19).

It’s a great weakness of our resilience work in New Zealand, we get so far in the process and then hand over information – we don’t actually do the ‘actioning’ part which is so critical. You are not really advancing anything because you’re not helping people think about their choices, trade-offs and values. You’re not helping their resilience at all, you’re simply giving them more information (Interview 2.4.19).

Resilience plans or strategies that are written without implementation in front of mind will not translate into such once published. At publication the party is over and the political sphere has had their announcement opportunity (Interview 11.1.19).

The 100RC strategy is really strong in developing a strategy but actually quite weak in terms of its ability to help implementation. A strategy for which nobody’s accountable for and for which there is no implementation plan is pretty much useless – it doesn’t do anything (Interview 22.2.19).

As outlined in the beginning of the report, completed resilience projects with tangible outcomes were difficult (if not impossible) to ascertain from the 100RC frameworks. Although a number of community initiatives, such as: #wellynextdoor; Life in Vacant Spaces; Ministry of Awesome; and Sister Cities in Christchurch have been implemented it is much less certain that the initiatives will (a) continue, and (b) lead to more resilient communities. Further, vague aspirational goals, for example, Goal 29 in Wellington, support widespread adoption of electric vehicles which is positive but lacks detail in how, or when, it will be achieved or if the goal has been implemented.
7 Recommendations: Fit-for-Purpose Resilience

We can now better appreciate how the legacy influence of risk management, natural hazards, legislative and funding frameworks, and institutional norms in Aotearoa have created a project-based landscape that is much more comfortable and effective at delivering absorptive resilience over other types of resilience. Rather than a predominance of absorb and stability types of responses to shocks/stresses, an amalgam of the three timescales (short- shock events, small to medium nuisance events, and slow changes in state) which shape responses would enhance the resilience to more ongoing and slowly emerging impacts or those that require more transformative changes because the changing risk state is taken into account.

That said, despite an acknowledgement that organisations need to change to enhance resilience, there is little evidence in practice, or indeed few empirical studies of how institutional transformation can be induced prospectively, based on foresight or minor incremental changes before events occur. The long-term lens required to respond to slowly emerging impacts does not fit comfortably within the institutional framings and governance frameworks currently available, particularly where there is frequent turnover of advisers, and decision makers with limited terms in office, and short electoral cycles. These findings support previous research, (e.g. Lawrence et al. 2013, 16) which outlined how most councils in Aotearoa: ‘are finding it challenging to address climate risks’ and there is a reduced political willingness of decision-makers to: ‘address climate change effects over timeframes beyond their terms of office at all scales of government’ leading to compromises (see also Handmer 2008; McDonald 2011). To allow for adaptive or transformational resilience to contribute to the suite of options, a deeper consideration of the forces that shape responses needs to be embedded in statutory and non-statutory provisions and projects. The flexibility to change over time is also necessary to respond to changing circumstances and needs.

While much progress has been made in raising awareness about the importance of resilience, and initiating projects under this concept, many questions remain about
how resilience is defined, identification of appropriate strategies for building resilience, barriers to implementation of these strategies, and limits to the potential effectiveness of these efforts. In particular, measuring resilience leads to a predominance of technocratic frameworks, conducted by consultants and engineers, and was identified as a problem that hampers shifting to more complex or people-centred resilience options. Recognising the limits to achieving resilience in economic and technical terms draws attention to how the costs of adaptation may exceed socially acceptable levels (see Adger et al. 2009; Rose 2007).

In order to think about resilience that might be transformational there were two projects that stressed spatial diversity in the supply of urban services and diversified economic activities along with greater social cohesion. One of them was urban food networks in Wellington (Project 6, Wellington 100RC) and a project on community resilience in the recovery-phase Kaiapoi, Christchurch called ‘You Me We Us’ (see https://youmeweus.co.nz/). Both projects deliberately promoted community resilience as a bottom-up, rather than top-down response at the local level and have been successful in linking the broader discourse on wellbeing to resilience by directly empowering communities to create several annual events which continually reconnect people in public space. However, the ‘rub’ is that these projects are place contingent, time consuming, rely on individual investment for their outcome, and have not been tested for efficacy based on indicators (i.e. are people more resilient?) to allow decision-makers to provide sustained institutional or financial backing.

Another issue emerged about measuring resilience at the community level. Community resilience measurement is linked to self-assessment by communities against their own sense of wellbeing or sense of readiness, which is highly contextual and variable at scale. For example, the Greater Christchurch region is a region diversely impacted by the Canterbury earthquakes swarms of 2010-2012, due to significant changes to the natural environment, including liquefaction, lateral spread near waterways, land level changes, and numerous rock-falls and landslides in
different suburbs (see Potter et al. 2015). Waimakariri district, one of ten across the Canterbury region is a mosaic of communities with different landscape connection, from low lying coastal areas to inland and higher land. Within Waimakariri, Kaiapoi is a low-lying coastal community with a quarter of the housing gone, 40 percent of the town centre having been destroyed with shaking and liquefaction versus inland Rangiora which was markedly less affected – they are two communities within one district that require quite different conversations about resilience related to context. How might we seek to take differing step towards community resilience that makes sense for different communities?

It should be noted that research participants did not readily locate themselves in ‘resilience projects’ per se. Instead, they were happy to discuss more generally challenges and implications of incorporating a resilience lens to their work. This links to our difficulty in isolating resilience projects within phase 1, where resilience is a positive attribute but one that becomes shaped by the professions and agencies involved. It was clear there is an obvious gap between the way academics and researchers talk about resilience and the way that organisations and professionals implement it in practice.

Table 3 outlines synthesised data from the interviews on what sorts of resilience are utilised in practice and how this influenced by how the problem is framed or the disciplines involved, etc. The second column illustrates how the shift to a more challenging resilience dimension needs to be based on fundamentally different foci.

<table>
<thead>
<tr>
<th>Focus</th>
<th>Absorb</th>
<th>Adapt and Transform</th>
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<td>Framing</td>
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<td>Climate Change, anticipatory and proactive</td>
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<tr>
<td>Disciplinary</td>
<td>Engineering/technical</td>
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<tr>
<td>Spatial</td>
<td>Infrastructure and economic</td>
<td>People and Places</td>
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<td>Financial</td>
<td>Annual budgets, clear benefits</td>
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<td>Temporal</td>
<td>Short-term shock,</td>
<td>Medium to Long Term, slowly evolving stresses</td>
</tr>
<tr>
<td>Methodological</td>
<td>Quantification, Cost/benefit analysis</td>
<td>Adaptive capacity/pathways, agile risk governance</td>
</tr>
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Table 3: Dominant institutional foci
7.1 Ways to operationalise fit-for-purpose resilience

A more fit-for-purpose resilience framework would enable more resilient outcomes to be achieved. For example, a suite of decision-making instruments that better account for the multiple ways in which people value and make decisions about the environment and their livelihoods/ lifestyles, that are aligned with the nature of stresses and shocks envisaged and experienced, and enable effective governance responses, would be more constructive than reliance on absorb responses geared towards business as usual.

In the face of ‘wicked problems’ like climate change, business as usual is untenable and transformational resilience becomes compelling for societal well-being. However, operationalising fit-for-purpose resilience takes political courage to implement, especially given the short-term nature of electoral cycles and the tendency to privilege private interests over public safety and sustainability concerns. Many people at councils around the country know that in some cases transformational responses will be required, however, there may be fragmented support and guidance, they do not have a solid dependable process for working through decisions of a transformational nature, and struggle to resource and undertake some of the harder decisions that climate change poses, for example, managed retreat in contrast to expenditure on hard protective structures. Working together, through more open communication across academia, scientists, governance actors and practitioners, progress may be made to address siloed institutional knowledge systems and to foster more innovative resilience-oriented practice. Although Lawrence et al. (2013) argued for a more integrated approach to managing climate change risk and the need for shared learning, this remains a challenge, in part due capacity, capability, availability of decision tools and coordination issues. However, it was noted by several key informants that, in Aotearoa, the science and academic community is encouraged by funders to work closely with practitioners and decision makers, and through practice-oriented
communication and lesson learning, progress is being made to operationalise resilience:

I think it’s just a matter of an alignment and refocus which would make a massive difference in our cities. I think we have come a long way and we’re getting a real benefit out of PhD students on the ground working with city officials to actually make a difference (Interview 22.2.19).

Foundational questions still need to be answered: Resilience to what, for whom; where when and how? Interviewees drew particular attention to foundational questions: Who pays? And who gets to make the decisions? Resilience strategies and guidelines have not addressed those issues in an open and transparent fashion. This may be less related to the pressing need to answer such questions and more related to the perceived level of political risk involved in tackling complex sustainability issues. However, many organisations are starting to take steps to address climate change into their resilience-building efforts. Further support will be needed to catalyse and sustain those embarking on this journey. The current political focus on climate change is heartening. Indeed, our current Prime Minister, Jacinda Ardern has outlined that climate change is the nuclear issue of our generation (Ewing 2017). There is now a more conducive political appetite at the highest levels, which may create opportunities based on implementation of the recommendations of the CCATWG (2018) regarding the governance and institutional changes needed for more resilience outcomes to be enabled. There is political buy-in for climate change and the impacts it brings, but resilience will need to permeate more fundamentally into organisational norms, right down to the funding of projects in councils and to practitioners working in communities. Fit-for-purpose resilience may also empower communities to develop agile responses that enable them to tackle the array of stresses and shocks they already face, and that will unfold over time, often in surprising ways. Key to building fit-for-purpose resilience is tailoring resilience responses that are stress, shock and context relevant and effective… and that together enable communities to realise community-wide aspirations in the short-, medium- and long-term.
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