Developing a National Inter-City Resilience Network

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Abstract

The purpose of this paper is to inform stakeholders on the factors and facilities required to develop a successful national-level inter-city network for resilience-building. Previous research revealed variations and discrepancies in the resilience status of New Zealand's major cities. It is desirable that all cities within a nation possess enhanced and relatively comparable resilience capabilities. This research studies the feasibility and operability of a national intercity resilience network to bridge the existing gaps between the cities through networking, collaboration, and knowledge sharing. This study was conducted in New Zealand as a case study. Literature review, stakeholder focus groups in New Zealand's major cities, and local and international semi-structured expert interviews were used to determine findings. The study revealed that an effective national-level resilience network needs a collaboratively identified common vision, formalised agreement, ease of use, a network management body, peer-to-peer relationship building, and effective knowledge exchange. The United Nations Sendai framework for Disaster Risk Reduction advocates for a collaborative approach towards resilience building, and therefore the findings of this paper can assist countries who are considering a collaborative approach for resilience in-line with Sendai.

Keywords: Resilience, Urban Resilience, National Resilience, Resilience Network, Resilience Collaboration, Intercity Resilience

Introduction

With the continual increase in frequency and magnitude of disaster events experienced around the globe, building disaster resilience in communities, cities, and countries is a priority. Resilience is defined as the ability to absorb the effects of a disruptive event, minimise adverse impacts, respond effectively post-event, maintain or recover functionality, and adapt in a way that allows for learning and thriving (Stevenson et al., 2015). Current international efforts to reduce disaster risk and build resilience are bound by the Sendai framework for Disaster Risk Reduction 2015-2030 (SFDRR) (UNISDR, 2015). The SFDRR calls for a better understanding of disaster risks and vulnerability, strengthening disaster governance and accountability, and strengthening the resilience of various disciplines and fields. The SFDRR endorses collaboration at the local, national and global levels to share knowledge, lessons learned and good practices to strengthen and develop resilience. It also calls for dialogue with various stakeholders including scientific, academic and technological communities and the utilisation of existing and indigenous knowledge (UNISDR, 2015).

This paper explores the concept of developing a national-level intercity resilience network and aims to present the requirements for developing a successful national-level intercity resilience network based on a study of five participant cities in New Zealand. An assessment of the level of resilience of the largest urban cities in New Zealand identified a large disparity in each city's resilience knowledge and activities and led to the suggestion that there was a need for a more collaborative approach to build resilience (Mannakkara et al., 2017), which formed the background to this study. This paper begins with an introduction to collaborative knowledge-sharing networks and how they can be used for resilience-building, followed by the methodology adopted for this study and results obtained. The paper concludes with a list of requirements in the areas of structure and management, and performance and facilitation that need consideration in the design and establishment of a successful intercity resilience network.

Collaborative Knowledge Sharing Networks

Collaborative knowledge sharing networks are formed between cities (intercity) as well as between stakeholders within a city (intracity). Both intercity and intracity networks are based around creating collaborative networks and relationships between stakeholders allowing them to exchange information and knowledge and work collaboratively towards a common goal (UN-Habitat, 2002; Gimenez et al, 2016). Sharing of knowledge, systems, tools, and resources can aid stakeholders and cities enhance their relationships and institutional capacities (Docherty et al., 2004). Thus, opportunities to learn from each other, learn with each other and collaborate to produce new knowledge, are all advantages of collaboration and knowledge sharing networks. Furthermore, collaboration and knowledge sharing provides cities with opportunities to complement each other's resources, align policies and standards, reduce staff costs, provide access to expertise, enhance trust and communication to solve problems, and reduce negative spill-overs (Warner, 2006; Bossuyt and Steenbergen, 2012; New Zealand Auditor General, 2004; Keiner and Kim, 2007; LeRoux et.al., 2010).

Keiner and Kim (2007) who studied transnational sustainability networks reported that temporal and spatial scales can be detrimental to intercity collaboration and cooperation, especially when combined with cultural details and differences between stakeholders. Tjandradewi & Marcotullio (2009) reported that intercity schemes may not be feasible where wider community participation is required. Lee and Jung (2018) discussed that differences in participant city size, socio-economic status, political conditions, leadership inclinations or partisanship may jeopardize the success of national intercity schemes. They suggested that grouping cities based on similarities as well as coordination between local authorities and central governments can aid the success of intercity schemes. Lieberman (2017) believed that similarities exist between cities even if they are not readily recognisable and that they can be identified through initiating discussions. Lgoe (2017) added that differences between cities can be overcome if the welfare of people is placed as a core principle.

Requirements for a Successful Collaborative Knowledge Sharing Network

Ease and efficiency of information flow, reciprocity, understanding, leadership, clear objectives, and united goals and direction were identified as critical factors for intercity network development by Tjandradewi & Marcotullio (2009). Studying collaborative emergency management and networks, Kapucu et al. (2010) declared that trust and commitment were the cornerstones of networks and collaboration schemes. De Villiers (2009) stated that support and policy from both the Central and Regional Governments, careful partner selection, resources, quality of management, stable organizational structures, formalized agreements, regular communication, and broader community involvement all nurture the success of intercity relationships. Van Lindert (2009) illustrated that administration support can be a success factor for international intercity collaboration.

Knowledge management is a critical aspect of a network. Knowledge can be implicit and explicit, with Bollinger & Smith (2001) defining explicit knowledge as "clearly formulated or defined, easily expressed without ambiguity or vagueness, and codified and stored in a database", and implicit knowledge as "the unarticulated knowledge that is in a person's head which is often difficult to describe and transfer". Each knowledge type requires different transfer modes and means (Van Ewijk & Baud, 2009), which needs to be considered in formulating the knowledge management system of a network. The provision of adequate Information and Communication Technology (ICT) resources and infrastructure, staff capabilities, training in ICT, and compatibility between systems are important for knowledge sharing in networks (Riege, 2005).

Enthusiastic leadership was identified by Abrahams (2016) and Reige (2005) as essential to the sustainability of collaborative schemes and networks. The management strategies of the networks need to be flexible to foster participants' interaction, reduce complexities, promote information sharing, develop incentives schemes, change roles and responsibilities, foster network self-organization and enhance communication (Keiner and Kim, 2007; Agranoff and

McGuire,2001; Suda, 2015). Nakamura et al., (2010) added that incentive schemes and fund allocation are also necessary to promote participation.

Existing Collaborative Knowledge Sharing Networks for Resilience

In 2013, the Rockefeller Foundation launched the 100 Resilient Cities program (100RC) with the mission "to catalyse an urban resilience movement" and "help cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st Century" (100 Resilient Cities, 2019a). The 100RC is an international intercity network which provides its participant cities financial and logistical guidance to establish a "Chief Resilience Officer" (CRO) to lead the city's resilience efforts; expert support to develop a "Resilience Strategy"; access to solutions, service providers and partners from the private, public and NGO sectors; and membership to a global network of member cities who can learn from and help each other (100 Resilient Cities, 2017).

The "Making Cities Resilient Campaign" (MCRC) was launched by The United Nations Office for Disaster Risk Reduction (UNISDR) in 2010 with the aim of supporting sustainable urban development through encouraging resilience actions, enhancing local level understanding of disaster risk, and stimulating local and national governments to commit to prioritising disaster risk reduction and climate change policy (UNISDR, 2012a). The campaign is led by the UNISDR, but is self-motivating, partnership, and city-driven, guided by a list of "Ten Essentials for Making Cities Resilient" developed in-line with the Sendai Framework (UNISDR, 2013). The campaign offers its member cities with partnerships, networks and practical tools and resources (UNISDR, 2013). In its first phase from 2010-2015, the MCRC developed the "Ten Essentials for Making Cities Resilient Checklist", (UNISDR, 2012b), the Local Government Self-Assessment Tool (LG-SAT) and the Handbook for Local Government Self-Assessment Tool (LG-SAT), (UNISDR, n.d.).

The Academic Network for Disaster Resilience to Optimise Educational Development (ANDROID) was another international intercity resilience network that was in place from 2011 to 2015, (University of Salford, 2011a, 2011b; Salim, 2012). The network was led by

Salford University's Centre for Disaster Resilience and funded by the European Commission with the aim of promoting co-operation and innovation among European Higher Education bodies. ANDROID's mission was to promote research in the area of disaster resilience, create learnings to raise awareness and establish a common understanding among stakeholders of the importance of disaster resilience education, and build the capacity of educational institutions to strengthen the link between research, teaching and informing policy.

Apart from these international intercity resilience networks there are emerging small-scale disaster resilience networks at the city-level, such as the Tulsa Disaster Resilience Network in the US (Disaster Resilience Network, 2017), and formal and informal community networks for resilience (National Science Foundation, 2018; McCann et al., 2016). However, no substantial information was found on the development and operation of intercity networks established specifically for resilience-building within a country, which presented an opportunity for exploration in this study.

Research Method

The findings for this paper were obtained through a qualitative case study conducted in New Zealand. Case studies provide an in-depth understanding of processes and cases which are under-studied and are suitable for extensive exploration of issues and challenges (Kumar, 2011). The overarching aim of this research was to identify the key features necessary to develop a successful national-level intercity resilience network, and therefore a case study approach was deemed most appropriate. A previous study conducted on the resilience status of New Zealand's cities and the conclusion that a more collaborative approach towards resilience was required for the country (Mannakkara et al., 2017) formed the basis for exploring this topic in New Zealand. The following section provides some background on disaster resilience in New Zealand.

Disaster Resilience in New Zealand

New Zealand faces great challenges when it comes to disasters. New Zealand's geography is unique and faces great challenges from natural disasters as a result of its volcanoes, earthquake fault lines, and position in the Pacific Ring of Fire leading to risk of tsunamis from earthquakes in the Asia-Pacific region. The country also faces weather-related hazards resulting in frequent flooding, landslides and high winds, (Officials' Committee for Domestic and External Security Coordination, 2007).

The governing framework for disaster management in New Zealand is the Civil Defence Emergency Management (CDEM) Act 2002, which guides the National CDEM Strategy and the National CDEM Plan, and is administered by the Ministry of Civil Defence and Emergency Management (MCDEM). The National CDEM Strategy which expires in April 2019, is being replaced by the new National Disaster Resilience Strategy which will set the long-term vision for New Zealand's emergency management, with a strong focus on building community and societal resilience, (New Zealand Government, 2019).

An analysis of the state of resilience in New Zealand's seven largest urban cities revealed that there were significant differences in how each city perceived resilience (Mannakkara et al., 2017). The level of hazard mapping, infrastructure resilience, resilience planning and strategies, and levels of community resilience varied between the cities. Mannakkara et al. (2017) reported that some cities had insufficient information on resilience-building concepts and theories, little knowledge on measurement and assessment processes, and experienced funding constraints that hindered their quest for resilience. Larger cities typically seemed better informed, developed resilience plans, identified and prioritised projects to enhance resilience, and secured financial, human and other resources for resilience-building. Two cities are currently members of the 100RC (see above section "Existing Collaborative Knowledge Sharing Networks for Resilience") (100 Resilient Cities, 2019b) and were found to be well connected, had dedicated Chief Resilience Officers and had developed

comprehensive Resilience Strategies (Wellington City Council 2017; Christchurch City Council, 2016). Other cities had dispersed resilience initiatives.

Data Collection

The sample population for this study was purposive. Purposive sampling involves deliberate population selection because they share a specific characteristic or feature which will provide the opportunity for detailed exploration and understanding of themes (Ritchie and Lewis, 2003). Furthermore, purposive sampling is suitable for case study approaches (Kumar, 2011). The seven largest cities of New Zealand which were studied by Mannakkara, Wilkinson and Milicich (2017) were invited to participate in this study, since they constituted nearly 74% of New Zealand's population (Statistics New Zealand, 2018). Five out of the seven cities agreed to participate, and data was collected through semi-structured interviews and focus group discussions. Please see Table 1 for information on the participant cities.

Semi-structured interviews provide a balance between flexibility and structure, allowing deeper and full exploration of targeted areas (Ritchie and Lewis, 2003), and the nature of this research required subjective insights from stakeholders in specific areas, therefore semi-structured interviews were chosen for data collection from some participants. Focus group discussions provide the opportunity for grouping a range of participants, and allows the opportunity to discuss opinions leading to more refined and deeper insights (Ritchie and Lewis, 2003). Thus, focus groups were held grouping stakeholders within cities. The participants for this study were selected on the basis of being directly involved in the resilience-building process of each city, in whichever way they chose to define resilience, with considerable experience, and were from the City Councils, CDEM Groups, Lifelines Utilities Groups and relevant private consultancies of each respective city. Focus groups were held at the respective city council premises of cities 2, 3, 4 and 5 over the period of July to October 2018 consisting of members from the city councils, CDEM groups and private consultancies who were available to take part. Arranging a focus group in city 1 was not successful, and the city's Chief Resilience Officer offered to provide views on behalf of the city in a semi-structured interview. Other semi-structured interviews were held with key

stakeholders such as the Lifelines Group, UNISDR, and an expert consultancy identified through the workshops and literature review. Please see Table 2 for the list of participants. Other stakeholders were not included in this study due to practical reasons such as timeframes, funding, and availability of participants.

Table 1: Participant City Profiles (Source: Statistics New Zealand)

City	Population	Area (km2)	Common Hazards (In order of highest to lowest risks)	Current Disaster Management System
1	521,500	444	Earthquake, Storms, Tsunami, Floods	Resilience Strategy, CDEM Plan
2	1,695,900	1,086	Floods, Volcanic, Tsunami, Earthquake	CDEM Plan, Development Strategy, City Plan
3	305,000	178	Earthquake, Storms, Tsunami, Floods, Volcanic	CDEM Plan, Regional Strategy
4	468,800	877	Floods, Land Instability	CDEM Plan, City Council Plans
5	624,000	608	Earthquake, Tsunami, Floods	Resilience Strategy, CDEM Plan

Table 2: List of Participants (Source: Authors)

Stakeholder Type	Data Collection Method	Code	Number of Participants	Organisation
City 1	Semi-structured Interview	C1	1	City Council
City 2	Focus Group	C2	2	City Council
City 3	Focus Group	C3	3	City Council
City 4	Focus Group	C4	15	City Council, CDEM Group, Private Consultancy
City 5	Focus Group	C5	12	City Council, CDEM Group
Other	Semi-structured Interview	P1	1	Lifelines Group
Other	Semi-structured Interview	P2	1	Private Consultancy
Other	Semi-structured Interview	P3	1	UNISDR

The interviews and focus group discussions were designed to collect the subjective views of the resilience practitioners regarding their perceptions, requirements, preferences and desired main characteristics of a potential national intercity resilience network. Interview questions and focus group discussion topics were developed based on the findings from literature. Interviews were approximately one hour in duration and focus group discussions were approximately two hours.

Data Analysis

Thematic data analysis was used to analyse the data collected. Thematic data analysis refers to the process of familiarisation with the data, identifying similarities and patterns from within the collected qualitative data, analysing them and reporting emerging themes (Braun

& Clarke, 2006). It is characterized by its flexibility, ease and ability to highlight similarities and differences, generating unanticipated views, and summarise key trends, (Braun & Clarke, 2006). All interviews and focus group discussions were audio-recorded, transcribed and thematically analysed. Some of the themes were pre-determined from literature (inductive), while others emerged from within the data (deductive).

Findings

The Need for an Intercity Resilience Network in New Zealand

As Tjandradewi & Marcotullio (2009) stated, the existence of a gap or driving demand is a critical factor for the success of a network. Most participants agreed on the need for the establishment of an intercity resilience network in New Zealand to assist with resilience-building as a national effort (P1, P2, P3, C2, C3, C4 and C5). P2 stated "I think there is a need. It is just about being clear what it is. I think there would be value". Only C1 disagreed with the notion of needing a resilience network in New Zealand with the view that there are better opportunities to learn from international cities and preferred to join international networks. C1 also inferred that other cities such as City 3 may not prioritise resilience and therefore would not have common goals in a network setting.

Mutual learning and collaboration were the most frequently mentioned motives for having a network in place. A participant from C4 stated "we have the opportunity to learn from each other. You don't have to go and reinvent the wheel", while a participant from the focus group in City 5 added "there were great examples of resilience activities that were going on in the smaller cities" that provided learning opportunities. Practitioners, especially from smaller councils, expressed their desire to learn from larger and more experienced councils. There was a clear interest in the resilience projects and initiatives conducted by larger cities. For example, Cities 2, 3 and 4 were interested in the progress of City 1 on issues concerning Sea Level Rise. Meanwhile, City 1 was praising the approach of City 2 on the same issue. A resilience network that facilitated knowledge sharing and collaboration between cities can offer the perfect alternative to capacity building.

The "power to convene" theme was suggested in the focus group held in City 5. "Power to convene" refers to the facility for stakeholders to meet when required and discuss and collaborate on rising issues, challenges as well as disaster events. A participant from C5 stressed its importance, "I think it is the power of a network to convene. It is not only about learning, but about getting together and working together".

Collective advocacy was also a recurring theme. At C5, a participant in support of collective advocacy stated "it is like fish swimming in a school. You have strength in numbers". C1 suggested, "I think there is power in connecting on resilience. That's probably more around advocacy to central government". C1 however recalled Local Governments New Zealand (LGNZ), which is a national-level organisation responsible for advocacy on behalf of local authorities with the Central Government (LGNZ, 2017), and stated that "I think it's really worth bearing in mind that that is exactly why LGNZ exists, and we should be using their existing frameworks to nationally advance the resilience agenda".

Enhancing relationships with peer practitioners and between organizations in a network setting was considered an advantage that can help with better communication and foster cross-planning activities. A participant from C4 stated "in my experience, face-to-face meetings are most effective. Knowing people beforehand, knowing what their capabilities are, learning about people in a social context as well as a work context, is beneficial". It was evident from the discussions that resilience practitioners from different cities wanted to know and be familiar with each other. Peer-to-peer familiarity was thought to facilitate information and data requests directly between practitioners. Establishing the connection with academia was also desired to initiate research into areas of need and facilitate the transfer of research outcomes into practice. Unanimous agreement on the importance of a network enhancing relationships through face-face meetings was evident from C2, C3, C4, C5 and P1.

The issue of the capability for "reciprocity" between cities in a national network was raised by most of the participants. Some cities within New Zealand had the required expertise,

resources, and funding for resilience activities and had already developed strong resilience-building initiatives. This led to some of the larger cities (e.g. Cities 1 and 5) consider their role in the resilience network to be more "donor"-oriented. C5 expressed: "We've got something to offer, but we do need support in terms of money and time to be able to provide support". Some participants within C5 deliberated that investing in sharing knowledge, experiences, tools, and systems with other cities may prove more cost-effective than extending resources and aid during disaster events. Other practitioners in C5 stated that sharing knowledge and tools with other cities would lead to "growing the influence and impact of our city on a national context" which is a good outcome.

Key Requirements for establishing a Successful National Intercity Resilience Network

Several key requirements for establishing a successful national intercity resilience network were revealed through the collected data. The requirements can be categorized into two groups, Management and Structure Requirements, and Performance and Facilitation Requirements.

Structure & Management Requirements: It was suggested that the network should have a management and administration body to act as the main planning body for the operations of the network, to coordinate the network activities, and facilitate member's issues and requirements. A participant from C2 questioned "Who would do the logistics, the organizing of the meetings, the agenda? You need a programme manager". P3 also strongly supported the existence of a management/administration body within the network that is solely appointed to run the network. A participant from C4 stated "I think it's important that there's that admin support. There's got to be somebody whose job is to run this thing. Otherwise, it'll just drift off".

The question of scope and who is to be included in a national intercity resilience network was prevalent within the discussions. Some participants stressed that resilience-building is a multi-stakeholder process and therefore should include all resilience practitioners. "It should

not be just local government. You need the economic part, social partners, private enterprises, small to medium-sized businesses, lifeline utilities, all who contribute to the final result" (C2). On the other hand, some suggested that the network should start with a certain focus, such as an infrastructure inclination and broaden gradually, P3: "There needs to be a balance between ambition and focus. I think it should start with a focus, and then as it gets momentum, tangible outcomes and evolves, the scope can expand. But I wouldn't start it as too broad or too ambitious in terms of scope". P2 agreed with P3 and stated "I like a narrower view in terms of saying we're talking about resilience to hazards and unexpected shocks and it falls under natural hazards and, say, climate change. And maybe a failure of infrastructure. But if we start talking about the bigger picture, things like societal inequality, it gets very muddy".

Affiliation of the network to a larger existing body or being a part of a well-renowned network was favoured by most participants. Some participants attributed the success of the UNISDR MCRC network to its affiliation with the United Nations (see section "Existing Collaborative Knowledge Sharing Networks for Resilience"). P2 mentioned "it should come under the banner of something, like the UN or global covenant of Mayors". P3 had a similar opinion and stated "from my experience, I think the UN brand is still seductive to cities. They want to be associated with it. In New Zealand, if you could develop a brand or associate with a major brand it would be appealing". Some participants like C2, P1, C3, C4, and C5 expressed agreement by suggesting that the network should be developed under an existing national network in New Zealand.

The formalisation of network participation was discussed as a requirement. Participants from C4 suggested devising proper agreements or Memorandums of Understanding (MOU) for partnerships between cities intending to enter into a collaboration scheme. They elaborated on the fact that such agreements should be supported by the mandates provided by each city which will assist in defining the scope and details of the collaboration.

Performance & Facilitation Requirements: Peer-to-peer learning was preferred over traditional research and learning venues, which was an incentive to be part of a network. A practitioner from C4 described peer-to-peer learning as "learning by osmosis". Another practitioner from C5 praised the learning exchange program conducted at the 100RC network where "you take people from a city and send them down to another city and work with that city on the challenges in that city which brings fresh perspectives and new learning. It is an immersion kind of thing".

Most of the participants indicated that they were already members of other existing networks (C1, P1, C2, C3, C4, and C5). Despite agreeing on the importance of a resilience network, participants expressed concern for the time and effort required. "We're all time-constrained" stated a participant in C3. A participant from C5 stated "we sometimes do it for the love of it and we try and do the work on top of our day jobs". "Make it as easy as possible" stated P1, which was a sentiment shared by all participants, indicating that the network needs to be clear and make their jobs easier, not harder.

One of the themes that unravelled during the discussions on network performance and facilitation was the importance of establishing periodic goals for network participants with specific outcomes. A participant in the focus group in City 5 suggested "I think it's a good thing if it was time-bound. We are going to do so or so, or practice so or so for the next X number of years, and then see the results". However, an issue was raised that with such goals smaller cities may be overshadowed by larger better-resourced cities. P3 opposed setting timeframes and tangible outcomes: "smaller cities should feel that they won't be overshadowed by the other cities. When you have a tangible deliverable for cities, there will be some tensions". As viewed by some participants, setting goals and targets may actually repel some cities from joining the network.

Mixed views were received on moderating and endorsing the information and knowledge being shared within the network. Some practitioners stressed the importance of information quality monitoring in order to ensure high quality and expert validation. A participant from

C2 suggested "having somebody who knows what best-practice looks like based on evidence or from their own experience" to moderate network content sharing. Other practitioners opposed the content moderation scheme, stressing that the network was to be comprised of professional practitioners who should be capable of assessing the reliability and validity of the content: "They don't need to be moderated. It's professionals working with professionals" (C3).

Concerning knowledge formats, some practitioners emphasized that the transfer of implicit knowledge into explicit knowledge was necessary but should be performed carefully. Their concerns stemmed from the fact that their past experiences with disaster-related documentation lacked clarity and caused confusion: "An epic amount of words, for a small amount of information" (P1). It was also revealed that the use of implicit knowledge has been prevented in many cases by the lack of political will to use such knowledge to make decisions. C1 claimed "we have an absolute abundance of (implicit) knowledge. That is not the gap. But I think that we have a gap, and it's in political leadership and the willingness to use that knowledge to make decisions".

Discussion

The interviews and focus groups showcased a congruent desire and need for a national intercity resilience network. There was a high awareness amongst resilience practitioners on the importance of sharing existing resilience knowledge and work collaboratively towards common solutions for the resilience challenges in hand. Prior experience of cities to natural disasters may have also enriched desire for continuous resilience knowledge sharing and learning.

The findings showed a high affinity and interest in mutual learning and collaboration. Mutual learning and collaboration were asserted as one of the major benefits of knowledge sharing and collaboration networks in line with findings from international literature (Warner, 2006; Bossuyt and Steenbergen, 2012; Sharifi, 2017; New Zealand Auditor General, 2004; Keiner and Kim, 2007; LeRoux et.al., 2010). While smaller cities in New Zealand with less

experience in formalised resilience-building activities were eager for the learning opportunities offered through a network with larger more experienced cities, it was recognised that there were opportunities to learn from smaller cities as well. The aim of the network is to make resilience-related knowledge and successful initiatives however large or small be available to all network participants for learning and sharing. The advantages of an intercity network approach towards resilience-building were discussed widely including the "power to convene" to unite to address specific issues, collective advocacy to unite together to make changes, and enhance and develop relationships between peers and with experts throughout the country to assist with best-informed resilience activities.

The study revealed that one city (City 1) opposed the establishment and participation of a resilience network within New Zealand, with the view that other New Zealand cities may not be aligned with City 1's resilience goals, which was discussed by Keiner and Kim (2007) as a common issue in intercity collaboration. City 1 had the view that it would be preferable to join international cities and networks who prioritised resilience. Conducting focus groups in other cities in New Zealand however, revealed that all the cities in this study prioritised resilience and were adamant to integrate resilience within their legislative and planning approaches. Such misconceptions with regards to strategic goals and directions between cities arise from the lack of communication and existing relationships between cities. Paulin and Edgar (2009) asserted that collaboration relies on existing relationships, and the lack of enthusiasm for participating in a network arises from inadequate pre-existing affiliations. On the contrary, being part of a network can aid in enhancing relationships between cities as suggested by Docherty (2009) and can be a positive experience.

With the need and use for a national intercity resilience network established, an important part of the discussions with the participants was around the requirements for successful network design. In terms of structure and management of the network, the participants' views emerged three themes: 1) the requirement for a management/administration body to run and manage the network, 2) the network being easy to use and undemanding in terms of time and effort, and 3) it should encourage and foster informal learning and knowledge

exchange between peers. Previous experiences with other networks cemented the need for the network to be a useful tool to assist their work, as opposed to an additional commitment. The network being a user-friendly, relaxed module will be required to gain the confidence and buy-in from cities to join. Lindert (20019) stated the importance of management and administrative support for international intercity collaboration, which was reflected in this case as well. Informal learning and knowledge exchange between peers can occur through exchange programmes, workshops, and seminars/webinars. Zanuso (2016) published an example of a successful exchange programme, the Rotterdam Exchange Programme under the 100RC where Chief Resilience Officers and their teams from nine cities facing water management challenges met in Rotterdam, and worked together to develop scalable solutions for cities of different sizes facing similar challenges. For the resilience network to be successful, such issues need to be taken into consideration in the early design stages.

Participant inclusion and network scope was a challenging issue with different views revealed. Although wide participation is ideal, it will be necessary to limit scope at the beginning stages of networks to improve practicality. Choosing the most suitable participant stakeholders within cities and between cities needs to be a carefully considered issue. In New Zealand since the current resilience efforts are typically led by City Councils and CDEM groups, commencing a network with these stakeholders might be the best option.

The concept of affiliation with a renowned network or being part of an existing network was appealing to the cities in this study. Such an affiliation would offer reputation, recognition and most importantly the necessary infrastructure, relationships, and resources to set up this network. Being part of an existing network would be a leveraging factor to encourage the participation of cities in the network. The final requirement for a successful network is a clear mandate and partnership agreement explaining member city roles, obligations and other details of the collaborations.

The findings confirmed many of the requirements for intercity network development from literature such as ease and efficiency of information, clear objectives, formalised agreements,

regular communication and administration support (Tjandradewi and Marcotullio, 2009; De Villiers, 2009; Lindert, 2009). Knowledge management was addressed; however, a discussion of required ICT resources for knowledge management and transfer did not seem to arise from the participants. Network leadership (Abrahams, 2016; Reige 2005) also did not emerge in the discussions as the view in New Zealand seemed to be an informal peer-to-peer network. A national intercity resilience network can definitely also benefit from considering the international intercity collaborative approaches adopted by the 100RC, (100 Resilient Cities, 2019a) and UNSIDR Making Cities Resilient Campaign, (Making Cities Resilient: My City is Getting Ready, 2019).

Conclusions

This paper explored the development of a national intercity resilience network. The intention of this paper was more so to understand how different cities with different challenges and ideas around resilience can be brought together, regardless of how they chose to define resilience. A general definition of resilience as an adaptive capacity to cope with, withstand and overcome disruptive events was used to frame the study. New Zealand was selected as a case study building upon a previous research conducted showing the large disparity in resilience initiatives and knowledge amongst the country's cities and a desire for a more collaborative approach towards resilience-building.

The initial step in developing an intercity resilience network needs to be an analysis of the needs, issues, and requirements of the identified participant cities. Getting stakeholders together and collaboratively exploring each other's concerns and identifying a common vision are suggested as a starting point to design and develop a mutually beneficial network.

This research identified that resilience networks can be used for mutual learning and for developing resilience solutions collaboratively. The network was seen to offer a platform for convening together when required and for collectively advocating and lobbying, as resilience practitioners, to the higher levels of government. Enhancing relationships and trust between stakeholders and cities were amongst the identified advantages of joining a resilience

network. In New Zealand, informal learning venues were preferred over traditional approaches, which shows that national networks need to be designed based on local needs and thus should not simply follow international network templates.

Requirements identified from this study to form a successful national-level resilience network included ease of use, minimal effort and time consumption, a network management/administration body, affiliation or being a subsidiary of an existing network, informal learning and knowledge exchange, and peer-to-peer relationship building. Launching the network with a specific focus and manageable scope is suggested until the network gains momentum. Setting time-bound deliverables is not encouraged, especially in a network including participant cities of varying sizes, capabilities and resources. A formalised agreement and mandate for the network need to be set with a practical knowledge management system that captures both implicit and explicit knowledge.

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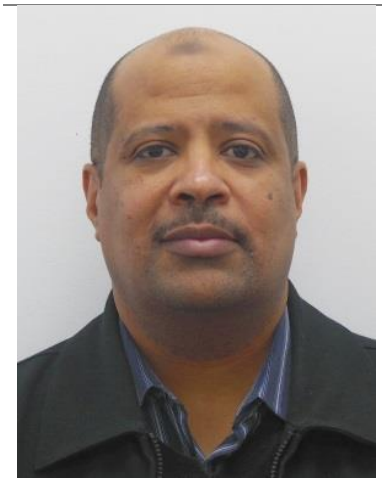

Elrasheid is an experienced Construction Engineer. He attained his Bachelor's and a Master's Degree in Construction Engineering from the American University and a Master of Construction Management from Auckland University of Technology. He was a Resident (Site) Engineer for more than ten years, after which he turned to Project Management and attained his Project Management Professional (PMP) certification from the PMI. He also worked at the United Nations Children's Fund, UNICEF as a Consultant Project Manager where he worked in disaster affected areas. Currently, he is a Ph.D. candidate at the University of Auckland, New Zealand.

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