Eastern Ontario's Leadership Council Economic Development

PRELIMINARY LITERATURE REVIEW

ECONOMIC RECOVERY AND RESILIENCE IN A REGIONAL LABOUR MARKET

(Recovery and Resilience Project)

A project undertaken by

Eastern Ontario Leadership Council (EOLC)

with the support of the

Ontario Ministry of Labour, Training and Skills Development

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TABLE OF CONTENTS

1. Executive Summary

Purpose of the Literature Review

With the onset of the COVID-19 pandemic, the Eastern Ontario Leadership Council, undertook a Preliminary Literature Review to understand 'resilience' in the context of regional economic development and especially regional labour markets. The review has proceeded sufficiently far to indicate that there are relatively few in-depth analyses that could be used *at a regional or local level* for resilience assessments or strategy development. Much of the work undertaken to date (mostly since 2008) has been at national (country) levels. In other words, if a *community or an entire region* wants to build a more resilient economy and associated labour market, the resource base upon which it can directly draw from is limited. In this sense, the EOLC is breaking new ground; this report should therefore be of relevance to many municipalities and regional bodies both in Canada and abroad.

> **"Regional economies are, in reality, complex adaptive systems that are subject to continual change and evolution"**
>
> Simmie, J. (2014). Regional Economic Resilience, A Schumpeterian Perspective.

The EOLC has articulated a desire to develop not just an assessment tool (resilience index) for regional and local use but also a set of resilience strategies that can be deployed to help communities and the region as a whole migrate to more stable --- and perhaps opportunistic --- ground. This literature review is the first step in developing the framework for both.

Preliminary Literature Review and Case Studies

This report represents the first draft of a report summarizing the *available public domain literature* considered to be relevant to the EOLC's Recovery and Resilience in a Regional Labour Market project. In all, more than sixty articles and other publications have been identified, and referenced at the end of this report. Note that the Preliminary Literature Review included searches specifically through publicly accessible web-based sources.

It is anticipated that as the Recovery and Resilience project progresses, additional resources and expertise may be identified. These will be added to the report and made available for public use. Documents cited in this Literature Review are available for stakeholder review in Dropbox and can be accessed by requesting permission from EOLC Project Coordinator, Kathryn Wood, at kwood4297@gmail.com.

2. Overview: What We Have Learned So Far

Key Observations:

This Preliminary Literature Review has generated a number of observations that are instructive for the Recovery and Resilience Project and stakeholders who seek to address the challenges of building resilience in Eastern Ontario:

1. **Resilience is thought of (and defined) differently in different places. Most, if not almost all, sources identify the difficulty in conceptualizing economic resilience.** Thus, it is important for policy makers, local officials and community members to conceptualize and agree upon notions of resilience before they start implementing strategies to build it and/or ensure it. How do you think we should define economic resilience?

Defining Recovery and Resilience

Term being defined	What does it mean short-term?	What does it mean long-term?
Recovery	Ability to respond to a crisis/ shock and implement recovery measures	Ability to return to pre-crisis/shock circumstances
Resilience	Ability to withstand a crisis/ shock	Ability to adapt to changing circumstances overtime

Our suggested definition of resilience: *A region's ability to withstand a wide variety of shocks that impact the regional economy, and adapt to changing circumstances.*

Examples of definitions of resilience:

- **Resilience as a Sum of Actions at Multiple Levels:** "Resilience results from the sum of all the different actions, strategies, investments, and anticipations that contribute to build that specific ability to deal with shocks, and that are undertaken ex-ante and ex-post, at different levels (individual, household, community, system, etc.)" (Béné, 2013).

- **Resilience as Policy-Induced Ability to Recover or Adjust:** "Economic resilience refers to the policy-induced ability of an economy to recover from or adjust to the negative impacts of adverse exogenous shocks and to benefit from positive shocks" (Briguglio, et al., 2008).

- **Resilience as Capacity to Adapt:** ''The capacity to adapt existing resources and skills to new situations and operating conditions. The term implies both the ability to adjust to 'normal' or anticipated levels

of stress and to adapt to sudden shocks and extraordinary demands. In the context of hazards, the concept can be thought of as spanning both pre-event measures that seek to prevent hazard-related damage and losses and post- event strategies designed to cope with and minimize disaster impacts" (Bruneau et al., 2003).

- **Set of Adaptive Capacities Fostered Through Interventions:** "… a process linking the myriad of adaptive capacities (such as social capital and economic development) to responses and changes after adverse events. Here resilience is as a set of capacities that can be fostered through interventions and policies, which in turn help build and enhance a community's ability to respond and recover from disasters" (Cutter et al., 2010).

"…on the long-run, resilience is not as dependent on a region's ability to repel shocks, but rather on their flexibility and adaptability to changing conditions"

Source: Giacometti, A., and J. Teräs. (2019). Regional Economic and Social Resilience, An Exploratory In-Depth Study in the Nordic Countries. NORDREGIO REPORT 2019: 2.

- **Resilience as Resistance and Adaptation**: "The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure" (Cox, 2015).

"… these analyses will allow us to find out whether… shocks are critical junctures and windows of change leading to transformative resilience and hence to new paths emerging out of the crisis."

Source: Gong, H., Hassink, R., Tan, J., and D. Huang. Regional Resilience in Times of A Pandemic Crisis: The Case of Covid-19 in China. *Tijdschrift voor Economische en Sociale Geografie, 111 (3),* pp. 497–512.

2. The study of resilience is in its infancy.

- A vast majority of the most relevant works were completed following the SARs and the Global financial crises of 2008-09.. Of the studies conducted after 2008-09, few analyses have explored regional resilience during and after pandemic crises. Thus, the effects of pandemic crises on regional economies and industries, as well as regional resilience, has not been heavily studied. This is in part due to the fact that qualitative and quantitative data is not available for study.

3. The literature notes particular challenges in measuring resilience.

- Much of the literature highlights the **difficulty in determining factors** which contribute to resilience, not only as a result of factors unable to be siloed from each other, but also the lack of consensus on what constitutes resilience and how resilience should be measured.

- Many also note that factors of resilience are not universal, but context and crisis-specific. In other words, complex factors, processes and arrangements which vary from one context to another shape resilience, and resilience may vary from one shock or crisis to another.

4. There are a number of recurring themes/ factors of resilience identified in the literature

Despite the challenges noted in measuring resilience, there are, however, a number of reoccurring themes/factors identified in the literature which are noted as contributing to resilience (see Table 1 below).

"In general, determinants that come to mind are a region's underlying growth dynamic, sectoral composition, export orientation and specialization, human capital, innovation rate, business and enterprise culture, its location, its institutional arrangements, and so on"

Source: Di Caro, P., and U. Fratesi. (2018). Regional determinants of economic resilience. *The Annals of Regional Science 60:235–240*. https://doi.org/10.1007/s00168-017-0858-x

Table 1: Factors Identified in the Literature, Organized by Thematic Area

Overarching Thematic Areas	Important Factors/ Themes of Resilience
1. Governance	Collaborative Governance and Policy (Regional and Local Cooperation)
	Nimble Governance and Policy
	Long-Range Planning- Integration of Resilience Thinking in Plans and Strategies
	Partnerships and Institutional Arrangements
	Establishment of Organizational Structures Specific to Recovery/ Prevention
	Sound and Effective Governance
	Well-Functioning Economic Policy Structures (Sound Labour and Product Markets, Framework Conditions and Political Institutions)
	Supportive Resource Flows/ Capital Buffer/ Stimulus Funds- for Targeted Industries, Local Businesses and Entrepreneurs
2. Economic Structures	Industrial Structure/ Sectoral Composition/ Supply Chains
	Diversification and Complexity
	Growth Dynamics
	Flexibility, Adaptability and Capacity for Change
	Accessibility and Factor Mobility
	Export Orientation and Specialization
	Competitiveness and Business Attractiveness
3. Innovation & Entrepreneurship	Institutional Supports for Start-ups and Entrepreneurs
	Capacity of Reorienting Skills, Resources and Technologies
	Embracing Technological Change and Adaptation to Restore Business and Industry Functions
	Climate and Culture of Entrepreneurship and Innovation to Ease the Entry of New Firms and Create Knowledge
	Encouraging Innovation and Entrepreneurship- New Technology Sectors
4. Human Capital	Flexible Human Capital and Labour Force- Transferability of Skills
	Flexible Labour Market
	Human Capital- Highly Skilled/ Experienced Workforce
	Accessible Transportation
	Ability to Retain Talent-Labour Market Attractiveness

See a full distillation of resilience factors broken down by crisis type see **Table 2 (page 18).**

1. Governance

The importance of the role of governance is heavily emphasized throughout the literature. There is much emphasis among the sources explored that that **resilience can be 'built in', via sound governance and policy making.** According to the literature, policymakers can play an active role in supporting resilient economies by addressing resources and efforts in the correct policy areas. **Public authorities at different levels have a key role in coordinating and building functioning systems** through the provision of services and by creating institutions and mechanisms of support for society and businesses to thrive.

The importance of collective and collaborative action is also explored. According to the literature, anticipating and reacting to shocks depends on the collective and individual actions of all actors in the region, as well as many from outside the region. Local/regional action can make a difference and both local and higher levels of public involvement/ collaboration are necessary.
The importance of collaborative governance is highlighted in Giacometti, A., and J. Teräs (2019): "…the volcanic eruption in 1973 in Vestmannaeyjar, the technological shock in Northern Ostrobothnia and Norrbotten and the oil price shock in Rogaland. In all these cases, the strong links between regional actors were not only important for coping with shocks but were also reinforced as a result of the collective efforts. This in turn strengthened their collaborative and entrepreneurial cultures for the years and challenges to come" (Giacometti, A., and J. Teräs, 2019).

In addition**,** other issues of governance including ***nimble and collaborative governance and policy*** (the ability to organize central actors and react during times of crisis, as well as governance and policy that can be altered and/or employed quickly), ***high-quality institutions*** (more effective government, greater voice and accountability, better control of corruption, etc.), ***collaborative institutional arrangements*** (including arrangements between various levels of government and the private sector), ***sound policy*** (including supportive policies to manage and mitigate crisis, strategies and policies specific to and inclusive of resilience, policies to establish agile innovation systems, address human capital and the structure of regional territorial capital, and regional

Factors of Resilience:

- **Nimble Governance and Policy**
- **Collaborative Governance and Policy**
- **Establishment of Supportive Organizational Structures and Policies**
- **Well-functioning Institutional Arrangements, Policies and Economic Structures**
- **Supportive Resource Flows/ Capital Buffer/ Stimulus Funds/ Access to Credit**
- **Policies to establish agile innovation systems, address human capital and the structure of regional territorial capital**
- **Effective and Targeted Regional Policy**
- **High-Quality Institutions (more effective government, greater voice and accountability, better control of corruption, etc.)**

"Policymakers can play an active role in sustaining resilient economies by addressing resources and efforts in the right policy areas without waiting for crises."

Di Caro, P., and U. Fratesi. (2018). Regional determinants of economic resilience. *The Annals Regional Science 60:235–240*. https://doi.org/10.1007/s00168-017-0858-x

"Public authorities at different levels have a key role in coordinating and building functioning systems through the provision of services and by creating institutions and mechanisms of support for society and businesses to thrive."

Source: Giacometti, A., and J. Teräs. (2019). Regional Economic and Social Resilience, An Exploratory In-Depth Study in the Nordic Countries. NORDREGIO REPORT 2019:2

policy directed in the right areas), ***the establishment of organizational structures specific to recovery and prevention***, and ***supportive resource flows*** both before and after crisis, are all indicated as essential to fostering resilience.

The importance of ***capital flows and supportive resources*** are discussed in terms of institutional backing to firm growth and expansion, as a means to help small business and entrepreneurs before and after a disaster (claims this can aid in the speed of recovery), and the importance of access to credit flows and stimulus funding during times of recession and/or crisis.

2. Economic Structure

The literature also pointed to the ***importance of the composition of industrial structures, sectors, and supply chains***. In particular, the literature noted the importance of ***economic diversification and complexity of economic structures, activities and markets*** (including diversification of employment, markets and industries, and the broadening and diversifying of supply chains and exports markets), which (according to the literature) spreads risk and wards off recession by allowing for a greater amount of stability when faced with shocks. Less dependence on foreign trade was also noted.

Factors of Resilience:

- Cross-scaled Linkages between Local and Regional Economies
- Diversification and Complexity
- Broadening and Diversifying Supply Chains
- Export Orientation and Specialization
- Competitiveness and Business Attractiveness
- Growth Dynamics
- Accessibility and Factor Mobility
- Enterprise Partnerships and Collaboration
- Well-Functioning Economic Structures

The role of ***well-functioning economic structures*** in building more resilient economies is also discussed. Sondermann (2016) **finds robust evidence that sound labour and product markets, framework conditions and political institutions increase resilience towards adverse shocks and reduces the incidence of crisis more generally**. In the presence of a common shock, a country with weaker economic structures can on average suffer up to twice the output loss in a given year compared to the country at frontier of institutional parameters. In a similar fashion, the likelihood of a severe economic crisis is reduced significantly if a country exhibits most ***flexible and adaptable institutions***.

Partnerships and collaboration, including enterprise partnerships, and linkages between industries are also mentioned as contributing to the resilience of industrial sectors (particularly service sectors). ***Cross-scaled linkages and collaboration between local and regional economies*** was also raised (i.e. local economies can benefit from the economic opportunities of the regional economy).

Eastern Ontario's Leadership Council Economic Development

Further, the importance of ***business and industry competitiveness*** is also noted. The competitive propensity of a region's firms and industries, and the importance of high-growth sectors, according to the literature, leaves businesses less cyclically sensitive and vulnerable to shocks.

At the community level, ***the accessibility of a community economy to a wide range of goods, services, and employment and business opportunities*** from its service centre, the importance of a ***strong base of community capitals*** (human capital, physical capital, natural capital, etc.) and a high level of factor mobility are noted as contributing to economic resilience.

3. Innovation and Entrepreneurship

There are a number of empirical studies which have underlined the significance of innovation and entrepreneurship to regional economic resilience.

Factors of Resilience:

- **Entrepreneurship**
- **Capacity to adapt and innovate- reorienting skills, resources and technologies**
- **Adaptive regional innovation systems and policies**
- **Climate and Culture of Entrepreneurship and Innovation**
- **Institutional support for start-ups/ entrepreneurs and their assimilation into regional knowledge networks**

In particular, the literature discusses the importance of ***the capacity for innovation***. At the firm level, it notes the significance of the ***innovative propensity and capacity of firms and businesses to adapt*** in the face of shocks, i.e. the ***ability of firms to adapt and adjust to new and changing circumstances*** following a crisis contributes to their economic resilience.

An article by Bristow, G, and A. Healy (2017), entitled *Innovation and regional economic resilience: an exploratory analysis,* provides supporting evidence on the idea that, in European regions, **the capacity for innovation is a crucial element for understanding the different performance of regional labour markets during the Great Recession**. They distinguish the European regions on the basis of three dimensions of innovation that are operationalised through different indicators: ***enablers of innovation, innovation activity and innovation outputs*** and find that innovation leaders either better resisted the crisis or came out of it more rapidly. The paper found that **regions identified as Innovation Leaders at the time of the crisis were significantly more likely to have either resisted the 2008-09 crisis or recovered quickly from it** (i.e. within 3years). This provides important insights for evolutionary approaches theorising the relationship between innovation and resilience. (By focusing on these three factors, the EOLC could support regional innovation --- through its forthcoming Municipal Innovation Certfication program --- and contribute to the region's economic resilience.)

"Innovation is thus a mindset and a capacity as much as an outcome of firm performance. Innovative regions may be better equipped to respond because they exhibit a protean attitude to the dynamics of and need for change."

Source: Bristow, G, and A. Healy. (2017). Innovation and regional economic resilience: an exploratory analysis. *The*

Note: Innovation Leaders include: region's with high levels of "enablers of innovation"- high population of tertiary education, public R&D expenditures, employment in knowledge-intensive services + employment in medium-high/high-tech manufacturing as % of total workforce, "innovation activity"- business R&D expenditures, SMEs innovating in-house, innovative SMEs collaborating with others, public-private co-publications, patent applications, and "innovation outputs"- technological (product or process) innovators (% of SMEs), non-technological (marketing or organizational) innovators (% of all SMEs), and sales of new to market and new to firm innovations as % of turnover.

Further, Bristow, G, and A. Healy (2017), also suggest that for the broader system (the organization, the community or society) to be resilient, it is not enough to innovate in technological terms. **Society needs to build the capacity for absorbing innovation.** Crucially, this suggests that it is not only the deliberate acquisition of knowledge that marks out human systems and makes them adaptive, but it is also the purposive deployment of that knowledge.

This signals an important message for policy makers:

> **"Whilst innovation does indeed build economic resilience, this is unlikely to be achieved simply through support for R&D activities and science and technology-led innovations. For economies to have the capacity to respond to shocks, enabling resistance or recovery, policies need to also promote the capacity for doing, using and interacting. Resilient economies are likely to have agile innovation systems which promote new combinations of activity, where organizations are willing to accept risks, and where adaptability is built into the behaviour and responses of key actors in the region."**
>
> Source: Bristow, G, and A. Healy. (2017). Innovation and regional economic resilience: an exploratory analysis. *The Annals of Regional Science, July 2017*. DOI: 10.1007/s00168-017-0841-6

Further, the ***relationship between adaptation, innovation and technology*** is also discussed throughout the literature. According to one article, ***a region's resistance to shocks depends primarily on the adaptability of a regional innovation system to external changing conditions***. Similarly, another article discussed the importance of ***firm ability to embrace technological change and adapt*** to restore business and industry functions following a crisis.

In terms of recovery following a disaster, Simmie (2014) takes up the argument that innovations drive economic recovery following cyclical phases of recession and depression. The performance of the regional innovation systems of two contrasting regions in England is examined. **It is shown that the long-term development of the regions' respective innovation systems contributed significantly to the long-run adaptation and consequential economic resilience of their economies in the face of periodic external**

economic shocks. **It is also argued that regional innovation systems policies can contribute to the adaptation of regional economies and therefore their economic resilience.** In this paper it is argued that the emergent collective innovation and adaptation of firms within a regional economy determines, to a significant degree, the long-run adaptive capacity and the short-term resilience, in the face of recessionary shocks, of a regional economy. **Innovation is not only of relevance in response to periodic shocks but also a key capacity in the ongoing need to compete especially in export markets.** This evolutionary process involves both the innovative upgrading of existing firms and the birth and development of new ones. The latter is particularly significant in the creation of new industrial and technological pathways (p. 107).

Further, the literature also indicates the importance of ***entrepreneurship*** to economic resilience. A study conducted by Jung (2015), entitled *The Impact of Entrepreneurship in Regional Economic Resilience: A Spatial Analysis of the US Gulf Coast Region*, examined **entrepreneurship as an important factor of regional economic resilience**. Analyzing the regional economic resilience of the regions affected by Hurricanes Katrina and Rita in 2005 and the 2008-09 Global Financial Crisis, the study finds that **entrepreneurship is positively related to employment and population growth in the affected regions**. According to the study, **regions with high entrepreneurial activities show higher levels of employment and population than regions with low entrepreneurial activities after natural disasters**. When other regional economic structures and the effects of hurricanes are controlled, the difference in the levels of employment and population is explained by entrepreneurship. Once the national economic recessions begin, however, the difference between high and low entrepreneurship counties disappears. This reflects that the role of entrepreneurship can differ according to the attributes of disturbances. Based on the empirical results, this study demonstrates that **entrepreneurship can be an important element of regional economic resilience**. To be specific, **its role is conspicuous in employment and population growth after natural disasters**.

Another source, claims ***entrepreneurial culture helps to ease the entry of new firms and create the capacity of reorienting skills, resources and technologies***. Lastly, the importance of the ***creation of institutional supports for start-ups and entrepreneurs***, as well as means to ensure their assimilation into regional knowledge networks is noted- to allow for entrepreneurs to contribute to the economic resilience of a region.

4. Human Capital

Quality and transferable human capital, and flexible labour markets, are also listed as essential factors to warding off and remaining resilient to economic shocks.

According to the literature, ***a flexible, adaptable and multi-skilled labour force acts as a "disturbance adsorption instrument,"*** allowing labour to shift from one sector (a sector hit by recession or shock) to another sector. Thus, identifying the importance of transferable skills to economic resilience.

In terms of flexible labour markets, the literature notes that ***regions with more flexible labor markets may be more likely to recover employment after it has been temporarily lost***. Specifically, right to work laws appear to have a positive effect on resilience. Another article notes that a ***flexible labour market shortens output returns and decreases output loss*** in the face of crisis.

Factors of Resilience:

- **Embracing of Adaptation, Innovation and Technology**
- **Entrepreneurship**
- **Capacity of firms to adapt and innovate- reorienting skills, resources and technologies**
- **Adaptive regional innovation systems and policies**
- **Climate and Culture of Entrepreneurship and Innovation**
- **Institutional support for start-ups/ entrepreneurs and their assimilation into regional knowledge networks**

The importance of the ***composition and quality of human capital*** is also discussed throughout the literature. According to one article, ***the relative capacity of a region to produce and create technological knowledge and to maintain it over time***, in particular during periods of economic crisis, is a key determinant of economic resilience.

"Economic development and capacity building require a skilled, trained, healthy and innovative workforce. The more skilled workers are in a community the quicker the local economy adapts to disturbances"

Source: Dinh, H., and L. Pearson. (2015). Specifying community economic resilience – a framework for measurement. Contributed paper prepared for presentation at the 59th AARES Annual Conference, Rotorua, New Zealand, February 10-13, 2015.

In relation to the quality of human capital, ***the importance of quality education and an experienced labour force*** is also noted. One study concluded that US counties with higher shares of relatively young workers (aged 25-44 years) on average had lower economic resilience, suggesting that having a more experienced labor force allowed US counties to cope better after the global financial crisis.

Surprisingly, having a more highly educated workforce, on the other hand, did not appear to make a county more resilient. Thus, ***the quality and composition of the labour force matters- quality education matched to the demands of a labour market*** is an important factor of economic resilience.

In addition, ***accessible transportation for the labour force*** was also noted as essential in the recovery from a crisis and in regard to economic resilience more generally.

5. Additional Factors of Resilience Worth Observing

In addition to the factors mentioned above, the literature makes note of a number of other factors that fall outside our thematic areas. These include:

1. Digital Connectivity

While the connection between digital connectivity and economic resilience is understudied, ***recent literature highlights the growing importance of digital infrastructure and connectivity to resilience, particularly in the face of crises***.

As noted by the literature, "realizing the benefits of digital technology in the workplace and as part of education and training, organizations are increasingly reforming the way we work and learn" (Fayez, R., and I. M. Al-Dakheel, 2020).

"An essential prerequisite for participation in the increasingly digital global economy is affordable telecommunications services. This is necessary to get a critical mass of the population online and acquiring digital skills, which in turn creates the potential for increasing adoption of digitisation in the economy as well as technology-enabled innovation."

Source: Ashton-Hart, Nick. (2020). Leveraging Digital Connectivity for Post-COVID Competitiveness and Recovery. A Special Focus on COVID-19 and the Commonwealth | ISSUE 162.

While ***digital connectivity is noted as a growing force transforming our lives and an increasingly essential prerequisite to accessing the global economy***, the literature notes that not only has Covid-19 accelerated the adoption of connectivity, but that future crises will be heavily intertwined with the digital transformation our society has already been undergoing, including the onset of automation, artificial intelligence, the internet of things, and others.

Further the literature notes, that **jobs that leverage digitisation generate more productivity and these are the very same jobs that can much more readily be performed remotely**, which is essential in the face of a pandemic and/or other crises.

Additionally, such **digital infrastructure will also be a gamechanger for micro, small and medium sized businesses**, which have been disproportionately impacted by Covid. "This impact has been largely due to the lack of integration of digital infrastructure in their workforce and challenges in getting access to capital..."

"If digital telecommunication infrastructure and applications are not equally available to all, regardless of location, those working and living in not served or underserved areas, such as many rural areas, are disadvantaged. This in turn restricts the ability of rural locations to grow economically, socially and culturally on their own terms."

Source: Roberts, L., and L. J. Philip. (2017 July). Rural resilience in a digital society (Editorial). Journal of Rural Studies 54 (2017) 355e359. DOI: 10.1016/j.jrurstud.2017.06.010

Lastly, the literature claims that **digital connectivity will play an essential role in closing the urban-rural divide**, and will play an indispensable role in ensuring the economic growth and resilience of rural communities.

2. Social Capital and Social Cohesion

The importance of social capital and social cohesion, regardless of the type of shock or crisis, are prominent factors leading to economic resilience among several sources of literature explored,

A number of studies have shown the important role of society at large, i.e. **the importance of** social capital and **organic local knowledge to** recovery and resilience. There is a trend among some of the literature that local and regional action is necessary, given local/ community knowledge of the needs of local economies and issues of blanket one-size fits all national solutions.

One study suggests that unsuitable **government disaster policy can actually undermine community rebound**. In other words, local community action and decision-making can be hindered by large-scale government edicts.

"While public authorities play an essential role in building resilience and recovering from crises, community plays an equally essential role."

Giacometti, A., and J. Teräs. (2019). Regional Economic and Social Resilience, An Exploratory In-Depth Study in the Nordic Countries. NORDREGIO REPORT 2019:2

The importance of strengthening community cohesion and bonds in order to work together and utilize available resources, during times of crisis is noted. According to a number of sources explored, social cohesion (including trust and confidence) contributes to the ability to self-organize and react in times of crisis. **"The capacity of a region to respond to changing conditions and all sorts of challenges appears to be tightly connected to human agency and human relations."** This includes social values and norms, loyalty, trust levels amongst people, sense of community and attitudes towards collaboration and driving change. "**There is a certain limit to what *public institutions can do, particularly when it comes to uncertain developments. Therefore, there is a need to rely on people and the society's ability to self-organise***" (Giacometti, A., and J. Teräs., 2019). Thus, the community spirit is crucial for coping with difficult times and remaining resilient in times of crisis.

"Individuals rebuild around one another. For this reason, it is vital that policy interventions free individuals to deploy their social capital as an asset in rebuilding."

Source: Chamlee-Wright, E. and Rothschild, D. M. (2007). Disastrous Uncertainty: How Government Disaster Policy Undermines Community Rebound. Mercatus Policy Series. Mercatus Center, George Mason University, No.9.

Eastern Ontario's Leadership Council Economic Development

Table 2: Preliminary Observations: A Distillation of Factors Affecting Economic Resilience																			
		Governance-Institutional Arrangements, Policies, and Economic Structures	**Supportive Resource Flows/ Capital Buffers**	**Culture and Resilience Thinking**	**Partnerships & Collaborative Culture**	**Industrial Structure/ Sectoral Composition / Industry and Business Ecosystems/ Supply Chains**	**Economic Diversification and Complexity**	**Export Orientation and Specialization**	**Competitiveness/ Business Attractiveness**	**Accessibility**	**Factor Mobility**	**Growth Dynamics**	**Flexible Labour Market**	**Human Capital; Quality of Education System; Transferability of skills**	**Accessible Transportation**	**Innovation and Entrepreneurship (Includes Technology)**	**Digital Connectivity**	**Social Capital-Perceptions, Trust, Confidence**	
Type of Shock	**Location**																		**Source**
Financial Shocks																			
Global Financial Crisis-08/09	EU labour markets															X Innovation			**Bristow and Healy (2017)**
Global Financial Crisis-08/09	EU regions-Unemployment resistance													X Technological/ knowledge creation and human capital		X Technological resilience			**Cappelli, Montobbio, and Morrison (2020)**
Global Financial Crisis-08/09 and Other Economic shocks	Regional economic resilience-European countries	X Policies -agile innovation systems, human capital and the structure of regional territorial capital	X		X	X			X					X		X			**Di Caro and Fratesi (2018)**
Post Global Financial Crisis-08/09	European Regions								X Open economies										**Fratesi and Rodriguez-Pose (2016)**
Financial Shocks and long-term changes	Britain (sub-national level)	X	X		X Local enterprise partnerships														**Broadbridge and Raikes (2015)**
Global Financial Crisis-08/09 (growth and employment)	US counties						X Higher levels of diversity to warding off recession but not subsequent growth						X Self-employed; Age of Workforce			X Entrepreneurship			**Goetz et al. (2016, March 7)**

Financial shocks (4 major recessions:1974-79; 1979-90; 1990- 2008; and from 2008 onwards)	UK regions-Regional Economic Resilience	X Effective regional policy; Government's fiscal stance in response to a deep recession may have consequences.	X Institutional support to firm growth and expansion. Access to credit flows.		X Linkages between industries-made certain sectors (particularly service sectors) stronger	X Industrial structure (but second to industry competitiveness)	X Diverse industrial sector is less vulnerable to shocks.		X Industry competitiveness			X Sectors with highest long-term growth are less cyclically sensitive	X Age of Workforce	X Workforce Skills		X			**Martin, Sunley, Gardiner, and Tyler (2015)**
Employment shocks	US				X local ownership insulates regions from economic shocks														**Kolko and Neumark (2009)**
Recessionary shocks	UK regions	X Regional economic structures and governance arrangements							X Competitive propensity of a region's firms							X Innovative propensity and entrepreneurial culture			**Martin (2012)**
Economic shocks	Two regions in UK	X Regional innovation systems policies-contribute to the adaptation of regional economies.														X Innovation and adaptation of firms			**Simmie (2014)**
Economic shocks	OECD countries	X Well-functioning economic structures-national level											X Flexible labour markets	X Quality of the education system-increases the employability of workers		X Climate of innovation to ease the entry of new firms			**Sonderman n (2016)**
Post-1970 Financial Shocks and Recessions	OECD countries	X Higher-quality institutions. Risk mitigated through prudential policies																	**Aida Caldera-Sánchez, et. Al. (2016, December)**

Natural Disasters																			
Disasters (general)	US	X					X Broadening and diversifying supply chains									X Embracing technological change and adaptation to restore business and industry functions			**Rose (2009)**
Disasters, Shocks and Emergencies	Nordic Regions	X Solid and efficient Institutions	X Financial buffer	X	X Collaborative culture amongst regional actors - excellent capacity for organisation and reaction	X	X Spreading risk through diversification of economic activities and markets- diversification of employment, markets, and industry.							X	X	X Spread highly skilled capital across all the smart specialisation domains to find more valuable innovation; Innovation and start-up funding			**Giacometti and Teras (2019)**
Hurricanes Katrina and Rita in 2005 and the Global Financial Crisis 08-09	US- Gulf Region		X Financial buffers and ways to help small business and entrepreneurs after a natural disaster can speed recovery													X entrepreneurs play important roles in the recovery of affected regions by increasing the number of employees and attracting people.			**Jung (2015, December)**
General Economic Resilience (Not Directly Disaster Related)																			
Economic resilience (general)	General (natural, economic, social and political).	X	X Community eco. resilience- Financial Capital; Natural Capital; Physical or Built Capital			X Cross-scaled linkages between local and regional economy	X Diversity of economic structure			X Level of accessibility of a community economy to a wide range of goods, services, and employment and business opportunities	X A strong base of community capitals in use and has a high level of factor mobility		X Need for a flexible multi-skilled labour force to act as a disturbance adsorption instrument	X The more skilled workers are in a community the quicker the local economy adapts to disturbances				X Enhances a community's ability to work towards collective goals; strengthening bonds to solicit support	**Dinh and Pearson (2015)**
Economic resilience (general)	General discussion	X			X Collective responses and strategies		X Regions whose export base is less concentrated are less more likely to be shock resistant.		X				X			X			**Hill et al. (2010, May 10)**
Economic resilience (general)	Scotland					X Business sector composition-													**Steiner, A., and J. Atterton. (2015)**

Pandemics																			
Covid-19	General				X Est. community level sharing economies; cooperatively owned firms														**Willman (2020, April 3)**
Covid-19	General			X														X	**Distasio, J. (2020, April 29).**
Covid-19	China	X Policy instruments- the role of support policies in times of crisis	X Role of stimulus funds					X Foreign trade dependence led to a less resilient economy											**Gong, Hassink, Tan, and Huang (2020)**
Covid-19	Common Wealth Countries																X		**Ashton-Hart, Nick (2020)**
Covid-19	Global																X		**Deloitte (2020)**
Covid-19 (General Crises)	Europe and World																X		**European Commission (2020, June 11)**
Covid-19 (General Crises)	OECD Countries	X Political and economic policies to safeguard and recover lost economic and societal functions from pandemics and other crises.																	**OECD (2020)**
Covid-19 (General Crises)	US		X														X		**Fayez, R., and I. M. Al-Dakheel (2020, August 20)**

- Importantly, there are a number of specific indicators regarding resilience and the labour market.

According to the literature, the **factors which contribute to labour market resilience** include:

Table 3: Factors Contributing Resilient Labour Markets	
Overarching Areas	**Specific Factors & Indicators**
Governance	Expenditures for active labour market policies
	Labour market attractiveness
	Flexible labour market regulations and policies (including macroeconomic policies)
Economic Structures	Strong support networks and financing for small businesses- includes capital buffers for recovery.
	Cooperative ownership (cooperatively owned firms/ worker cooperatives tend to retain labour during downturns)
	Diversified economies and markets- reduces frictional unemployment
	Labour market composition- service oriented (more resilient) vs. manufacturing oriented (less resilient)
Human Capital	Flexible Workforce/ Skills transferability- adaptable skill sets and labour mobility
	Workforce development and training- linked to development efforts, customized curriculum; fostering of creative class, entrepreneurs, and smart workers.
	High quality human capital- knowledge generation- innovative and adaptive thinking, quality education and skills related to the labour market
	Accessible transportation (supports labour market access)
Entrepreneurship and Innovation	Funding for start-ups and entrepreneurs
	Climate and culture of innovation and entrepreneurship- facilitate new businesses and firms
	Integration of entrepreneurs into regional knowledge sharing systems

Table 4: Top 5 Common Factors Contributing to Resilience (Regardless of Crisis or Shock- Across All Literature)
1. Sound Governance, Institutional Arrangements, Policies, and Economic Structures
2. Partnerships and Collaboration- At Every Level
3. Innovation and Entrepreneurship (Innovative propensity and entrepreneurial culture)
4. Capital Buffers- Supportive Resources/ Emergency Funds- for Targeted Industries, Local Businesses (Small Business) and Entrepreneurs
5. Human Capital- Flexible Workforce, Quality Education, Transferability of Skills

These Factors can also be divided by crisis/disaster type:

Table 5: Factors Specific to Crisis and/or Disaster Type (As Indicated by the Literature	
Economic & Financial Shocks	Industrial Structure/ Sectoral Composition/ Agglomeration Economies/ Industry and Business Ecosystems/ Supply Chains.
	Competitiveness (Industry and Firm) and Business Attractiveness
Natural Disasters	Culture and Resilience Thinking
	Accessible Transportation
Health Related Crises	Social Capital- Trust, Confidence, Social Cohesion, and Community
	Digital Connectivity
General Economic Resilience	Economic Diversification and Complexity- Diversification of markets (including exports), supply chains, industries and employment.
	Accessibility- level of accessibility of a community economy to a wide range of goods, services, and employment and business opportunities.
	Factor mobility- the ability to move factors of production - labor, capital or land - out of one production process into another.
	Social Capital- Trust, Confidence, Social Cohesion, and Community

5. There are many frameworks which attempt to measure and/or assess economic resilience (resilience indices)

There are numerous articles which discuss frameworks and toolkits designed to assess resilience. Importantly, although there are a number of metrics, standards and indicators that exist to try and measure/ assess resilience, there is *no consensus* among scholars or the literature.

Further, of those sources which attempt to measure resilience many concentrate on resilience to disasters, specifically natural disasters. Despite this, a number of indexes provide examples on how to create measurement tools at the community and regional levels.

a. Rural Resilience Index (RRI)- (Community Level- Disaster Management)

Researchers from the Justice Institute of British Columbia, and partners, undertook the development of a resilience assessment index to be used in a rural community context. The index was generated as part of a larger applied research project, designed to respond to the global emphasis on increasing the capacity of all communities to meet the growing challenge of disasters, climate change, and other threats

The Rural Resilience Index (RRI) is designed as a user-friendly, process-based, qualitative resilience assessment tool. It emphasizes the value of widespread citizen engagement in resilience planning and a whole-of-community approach to resilience. The RRI was developed from a systematic analysis of existing resilience assessment and community wellness frameworks and indicators (see Annex A for the full list), and further informed by a rigorous analysis of data collected through interviews with rural end users and key informants. The RRI gathers together a set of qualitative indicators under categories and factors of community resilience that address such things as the quality and availability of local resources, expertise, skills and services; governance issues; economic and employment issues; culture; disaster preparedness; and emergency management planning.

Access the Rural Resilience Index (RRI) here: https://rdrp.jibc.ca/files/2012/06/RDRP_RRI.pdf

b. The Australian Innovation Challenge (2015)- Composite Resilience Index- (Regional Level- Climate Change Adaptation)

While the Resilience Index is a modelling tool to measure the resilience of local communities to climate extremes, the broader resilience index presents a powerful tool which may be used to reveal the relative resilience level of any region worldwide, regardless of the type of disaster/ crisis.

The Index uses the following steps to develop a model to measure community resilience:

1. Setting framework or model parameters (determination of study area, targeted outcomes, data requirements)
2. Measuring antecedent or current conditions (community profile and hazard profile to understand inherent vulnerability and resilience in social systems, natural systems and the built environment)
3. Risk analysis (assessment to look at frequency, duration, intensity, magnitude, and rate of onset for hazards)
4. Understanding risk response (formal and informal coping mechanisms)
5. Determination of vulnerability indicators and required data to measure indicators

6. Weighting of indicators and sensitivity analysis
7. Vulnerability assessment or modelling.

Rationale: Identified indicators fall within subcategories in which it is evident that the greater the strength within these areas, the greater the populations' resilience and adaptive capacity in the face of natural hazards and a changing climate. All selected indicators have been grouped under one of the four resilience environments – social, built, natural or economic – and these groups will be used as sub categories for the proposed resilience composite index. The combination of these individual indicators with applied weighting factors comprises our composite resilience index.

Weighting: Weighting factors for each of the indicators were determined via a consultative process. The 18 participants were asked to rate the indicators within each category, with 1 being the indicator they perceived to have the highest correlation to resilience up to n (the lowest correlation with resilience), where n is the total number of indicators within the category. Each of the four categories (social, built, environmental and economic resilience) were then ranked, with 1 indicating the category with the highest significance to the concept of resilience, and 4 indicating the lowest importance to resilience. Each of the surveyed rankings for the indicators were then averaged to provide an overall averaged rank.

The four categories were assigned weightings using the Rank Reciprocal Method:

$$wt_C = \frac{\frac{1}{r_{C,avg}}}{\sum_{j=S,B,N,E}\left(\frac{1}{r_{j,avg}}\right)}$$

where rC, avg represents the average rank of category C, and j represents each of the four indicator categories including social (S), built (B), natural (N) and economic (E) environments.

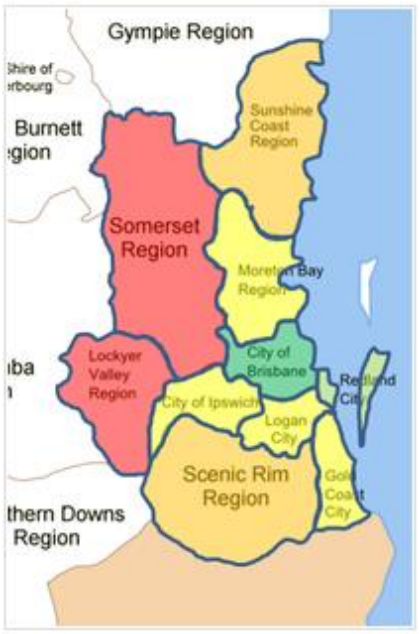
Example of the Index in Action:

To demonstrate the potential of the disaster resilience index, the index was applied to 11 Local Government Areas in the Greater Brisbane Area; Sunshine Coast, Moreton Bay, Somerset, City of Brisbane, City of Ipswich, Logan City, Redland City, Gold Coast City, Scenic Rim Region and the Lockyer Valley Region (Australia). Using the index, the comparative resilience level of each of these regions was identified. This information was utilized to generate a colour scale ranging from red (least resilient) to green (most resilient) using standard deviations from the average and the results over-layed onto a map of the region (see below).

Example of Economic Category Results:

			Economic								
			Employment		Inequality		Housing Capital		Wealth		Economic Category TOTAL
			Percent employed (Census Data)		Socio-Economic Index for		Percent homes owned		Median Total Personal		Possible maximum of 30
Location	State	Country	E1	W1	E2	W2	E3	W3	E4	W4	E
Sunshine Coast Region	QLD	AUS	44.01%	5%	1001	5%	33.81%	5%	519	15%	19.56
Moreton Bay Region	QLD	AUS	46.16%	5%	995	5%	27.87%	5%	581	15%	20.69
Somerset Region	QLD	AUS	40.42%	5%	932	5%	36.48%	5%	445	15%	17.62
City of Brisbane	QLD	AUS	51.87%	5%	1057	5%	27.72%	5%	696	15%	23.70
City of Ipswich	QLD	AUS	44.82%	5%	960	5%	23.04%	5%	592	15%	20.44
Logan City	QLD	AUS	45.79%	5%	965	5%	22.96%	5%	576	15%	20.17
Redland City	QLD	AUS	49.01%	5%	1030	5%	31.72%	5%	608	15%	21.75
Gold Coast City	QLD	AUS	46.84%	5%	1016	5%	26.32%	5%	571	15%	20.51
Scenic Rim Region	QLD	AUS	44.34%	5%	932	5%	36.01%	5%	493	15%	18.82
Lockyer Valley Region	QLD	AUS	41.93%	5%	938	5%	32.39%	5%	462	15%	17.88

Example of Economic Category Mapped Results (as above):



Note: Data tables and mapping would be completed for all four indicator categories including social (S), built (B), natural (N) and economic (E) environments.

c. There are also a number of sources which include an array of resilience areas in their assessments, including social resilience, economic resilience, institutional resilience, infrastructure resilience, and community capital.

d. Further, many approaches to measuring resilience often limit their analyses at one unique level or scale (ex. household level, community level, country level, etc.). As Béné (2013) notes, this indicates **the need for resilience specialists to adopt a multi-scale, generic and multi-dimensional metric.**

6. There are a number of case studies which shed light on factors which contribute to economic resilience and what regional actors can do to foster resilience.

- Among case studies that exist, most are conducted at the community and country levels, and cover contexts in the US, a number of Nordic countries, countries of the European Union (EU), and the UK. Note: These case studies are inclusive of both man-made disasters (shocks and financial crises) and natural disasters.

- While the **case studies** are focused on different geographical areas (ex. Country) or approach (ex. government response), there are a number of commonalities among the case studies which can help the EOLC identify its preferred factors and indicators and design its own resilience index.

    - **Common themes and factors of resilience among the case studies include:**
        - Governance
        - Long-Range Planning
        - Support for Targeted Industries, Local Businesses and Entrepreneurs
        - Workforce Development and Education
        - Entrepreneurship and Innovation
        - Resilience Thinking

- In addition, there were a number of **community level resource toolkits** identified to increase economic recovery and resiliency following disasters (man-made and natural disasters). These include a number of case studies in the Canadian context. See Saskatchewan Economic Development Association (2016) and Economic Developers Alberta. (n.d.).

- See **Appendix B** for detailed accounts of the case studies reviewed.

Appendix A: References

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Appendix B: Case Studies

Regional Economic and Social Resilience: Conceptual Debate and Implications for Nordic Regions

REGION	SHOCK (TYPE OF SHOCK)	SUCCESS FACTORS/ POLICY RESPONSES	OTHER FINDINGS
BOSTON, USA	**Covariate/technological shocks** Structural changes in the industrial base	Skilled people reinventing the city; sufficiently diverse economic base; government supporting the establishment of knowledge institutions	The city´s attractiveness has kept skilful inhabitants from leaving the city
WEST MIDLANDS, UK	**Slow-burn region, covariate shocks and stressors** unsustainable industrial mix. The 2008-2009 Recession saw a high unemployment rate.	Establishment of West Midlands Regional Taskforce in response to recession. Policies: e.g. loans, support key strategic sectors through different programmes	The Taskforce´s contribution to 5900 jobs through funding and advisory programmes
ARENDAL-GRIMSTAD, NORWAY	**Slow-burn region, stressors** Risk of losing locally operating companies, 1990s	State subsidies, establishment of a technology park, state as a customer, networking	The city´s attractiveness has kept skilful inhabitants from leaving the city
SKÅNE, SWEDEN	**Covariate/technological shocks**: Asian competition, Corporate downsizing in ICT	Open innovation and cluster platforms as long-term responses	Diverse industrial base facilitates the search for new pathways
LIEKSA, FINLAND	**Slow-burns, stressors** risk technological shocks, decreasing the need for human labour, companies moving to low-cost countries	Local re-employment activities benefit from national reindustrialisation policies, post-productivist turn in forest use	The establishment and maintenance of the welfare state created jobs in the region
VEJLE, DENMARK	**Risk of environmental disasters followed by economic shocks** The city to be under water in 2100; lack of social cohesion	Resilience Strategy; 100 resilience initiatives; a position of a Chief Resilience Officer	Implementation from 2017
OULU, FINLAND	**Covariate/technological shocks, slow-burn** Global competition on technology industries, closure of ICT companies and subcontractors	Correctly targeted policy measures (diversification); Nokia´s Bridge Programme for re-education and entrepreneurship; regional social capital	The city´s attractiveness has kept skilful inhabitants from leaving the city
SUÐURNES REGION, ICELAND	**Idiosyncratic and covariate shocks** US Military abandoned. Global financial crisis	Government eased local debts. Regional development agency was established to promote cooperation between entities in the area.	Synergies, proximity with capital area. increased population and construction. Increased tourism.
SIGLUFJÖRÐUR, ICELAND	**Idiosyncratic shock followed by slow-burn** 1960s the herring stock disappeared.	Municipality merged with adjacent town. Major improvements in transportation, tunnels.	Increased tourism. New development paths, largely dependent on single investor.
NORWEGIAN PERIPHERAL REGIONS	**Slow-burn, stressors, idiosyncratic shocks** peripheral regions experiencing long term stress, **abrupt** closure or downsizing key companies	Regional Restructuring Programmes mobilising local and regional actors to counter declining trends and promote employment	Restructuring Programmes have had an influence in diminishing the adverse effects

Source: Giacometti, A., Teräs, J., Perjo, L., Wøien, M., Sigurjonsdottir, H., and T. Rinne (2018). Regional Economic and Social Resilience: Conceptual Debate and Implications for Nordic Regions. Discussion paper prepared for Nordic thematic group for innovative and resilient regions, January 2018, Stockholm.

Regional Economic and Social Resilience, An Exploratory In-Depth Study in the Nordic Countries		
Case Studies:[1]	**Type(s) of Shock**	**"Resilience Drivers"/ Learnings**
1. NORTHERN OSTROBOTHNIA, FINLAND	Exogenous and endogenous (global and local) shocks and threats: Technological risk, commodity price risk, and loss of income generating activity, policy induced risk, geopolitical risk, demand driven risk, demographic changes and attractiveness (p. 28-31).	The development of a status report on existing economic activities, and effective coordination between regional and national institutions, appear to be the core mechanisms bolstering long-term thinking and preparedness in Northern Ostrobothnia. The exceptional collaborative culture amongst regional actors has demonstrated their excellent capacity for organisation and reaction in the face of serious problems that have a wide impact on all regional structures, such as was the case during the shocking collapse of Nokia. • **National mechanism and regional strategies** Regional councils in Finland are responsible for the strategic planning of regional development. The regional plan, done every fourth year, is a long- term strategic view of the region's objectives to develop according to its needs and opportunities. The strategy is always completed together with national authorities and ELY-centres (state level agencies responsible for economic development, transport and the environment), in cooperation with local authorities, universities and other relevant regional authorities. As part of a key project implemented by the Finnish government to boost employment and competitiveness in the regions, the national institutions started to integrate resilience thinking into mechanisms that aim to support structural changes. Support for regions that confront abrupt structural changes (äkillinen rakennemuutos, ÄRM) is the first, well-established national mechanism. Following many negative abrupt shocks in Finland, the Ministry of Economic Affairs and Employment started to advise regions to take more action to anticipate these. Resilience thinking and preparedness were also intended to be permanently integrated in the region's development plan, including the more detailed regional implementation plan. However, there is so far no formal evaluation of this. A funding programme, 'Regional Innovation and Experimenting' (AIKO fund), was announced by the Ministry of Economic Affairs and Employment in 2015, for regional councils to support innovation in their regions. In order to receive this national funding, Finnish regions created action plans on how they would react to anticipated structural changes (ennakoidun rakennemuutoksen suunnitelma, ERM). To accomplish this, the regional Council of Oulu Region involved all local authorities in evaluating regional resilience, starting with a status report on local authorities' economic and employment structure. An extensive analysis of the existing structures and figures was carried out, considering the national and global trends surrounding each economic sector, in order to identify any potential risks. The regional council examined each risk-bearing sector and compiled a document in which each sector's preparedness for potential forthcoming shocks was anticipated. The document described each identified risk and anticipatory actions (described in chapter 3). The document also indicated an elaborate action plan for different authorities and institutions in case of an abrupt structural change. The long- and short- term strategic elements ensuring regional resilience were also incorporated in the recently updated regional implementation plan. This emphasised the importance of anticipating actions to respond to the depletion of the Pyhäsalmi mine, dynamic conditions within the ICT sector in Oulu region and potential economic growth linked to the nuclear power plant.

[1] These case studies discuss a wide variety of economic resilience issues (beyond unpredicted disasters) - might be valuable in terms of cross-cutting resilience issues and for longer-term planning. There is a lot of detail here… sorry if it is too much but I thought you might get some ideas from it… what made certain case studies resilient and some of the initiatives they adopted to improve resiliency.

		The far-reaching work done in preparation for the action plan by involving local authorities, targeting efforts towards good background investigation and a true willingness to find a region's strengths, evidenced the region's high commitment to resilience thinking. These efforts were acknowledged at national level and this was one of the main reasons Northern Ostrobothnia was one of the biggest recipients of AIKO funding in 2016–2018. Well-integrated resilience thinking is also visible in the region's smart specialisation strategy, which aims to diversify the economic structure within the domains that are the strategy's main focus. It is also closely linked to the anticipatory actions. Recently, the criteria for applying for abrupt structural change funding has been adapted to incorporate positive structural changes as well. This change has the potential to proactively direct development in line with global trends, and profit from the upcoming opportunities before they turn into threats. In addition to this, a major change is expected across the regional administration, as the Finnish government is preparing considerable regional reforms that will unquestionably transform many aspects of the existing mechanisms relevant for resilience. The reform aims at improving dialogue between national and regional levels. To facilitate this dialogue, each region is expected to make a 'snapshot' report on its main measures and objectives. This report does not address the question of resilience directly, but it does include short analyses of the region's economic structure, its strengths and any anticipated development trends. The process of elaborating the report also supports the regions to be aware of dynamic conditions and evaluate them. The reform has the potential to strengthen the public institutions and their capacity to react to threatening developments. However, if the new organisation does not effectively respond to needs, there is also a risk of it damaging well-functioning mechanisms or affecting public trust in public authorities. • **Improving resilience by 'creative destruction'** Northern Ostrobothnia's action plan on anticipated structural change includes a detailed plan for abrupt structural change (shocks), such as a large number of employees being dismissed from a single company or other economic challenges affecting an entire sector or production chain. This action plan is largely based on the good practices learned during the technological shock and sudden structural change experienced by the region's high- tech sector when its over-dependence on a single company and a single product – Nokia Corporation and mobile technology – led to notable structural changes between 2001 and 2011. Nokia's inability to keep up with international mobile phone markets resulted in approximately 3000 job losses in the high-tech cluster, and it affected the whole supply chain, a highly specialised network of subcontractors (Simonen et al., 2016). Simonen et al. (2016) argued that an efficient combination of creative destruction and correctly allocated policy measures were the key factors for a fast recovery. Creative destruction essentially implies a transformation of the economic structure because of the 'mutation' or evolution of the industrial base through the emergence of new technologies. These success factors are also acknowledged in the regional strategy, which identifies swift reactions and close cooperation and communication between key authorities and organisations as prerequisites of the creation of new successful response mechanisms. Well-functioning policy measures resulted from the ideal triple helix cooperation between versatile public authorities, an established innovation alliance and an encouraging business sector, 'BusinessOulu', owned by the city of Oulu. The 'Tar Group' was a management group or task force consisting of different public authorities, which was established specifically to address the structural change. It allocated 30

		million euros of financial support comprised of 'ÄRM' funding from the national government, and ERDF and EGR funding from the EU. (Interview 6) Funding was allocated to efforts to build up innovative start-up ecosystems, targeted educational events and courses, and projects within the network of innovators – the 'Innovation Alliance' – and the regional SME network. The responsibilities were shared by the Council of Oulu Region, which was responsible for identifying new potential SMEs and developing novel operational environments; TE-services (employment and economic development offices in Finland) together with ELY-centres, which were responsible for providing tailored human resources and targeted educating services; and ELY-centres, which were responsible for allocating financial and functional investments to SMEs (Herala, et al., 2017). Targeted education projects were an effective way of helping people to find new job opportunities within the high-tech sector. A high participation rate for the education projects was the first sign of people's commitment (Herala, et al., 2017). Besides the financial support, many new, technology-based business incubators were founded in Oulu. Their aim was to create an innovative social network, where unemployed people could also strengthen and develop their new business ideas based on their expertise. This reduction in the mis- match of know-how between potential new employees and employers was and still is one of the main educational aims in Oulu region (Interview 4; Interview 5). It was not only people's willingness to reeducate themselves and stay in the region but also Nokia's loyalty to the region that was an interesting enabling factor for rebuilding a creative high- tech cluster in Oulu. Nokia supported educational programmes but also gave away unused patents and provided start-ups with financial packages that could further develop Nokia's ideas (Interview 5). 'Creative destruction' is a good description of the ICT sector's development process in Northern Ostrobothnia. Today there are approximately 650 high-tech companies whose need for competent employees is even stronger than it was before the structural change. However, the shortage of competent labour is one of the biggest challenges for the high-tech sector if it is to grow further (Council of Oulu Region, 2018). The strong entrepreneurial drive of people in Oulu shows their commitment, loyalty and willingness to change and adapt to transforming conditions. Today this entrepreneurial ecosystem is extremely dynamic and there is a fast-developing start-up culture and increasingly diversified SME network. During the past five years, more than 500 high-tech start-ups have been established in Oulu (Oulu Finncham, 2018). According to the OECD and Eurostat's definition of high growth enterprises, Northern Ostrobothnia is one of the regions with the highest number of high-tech SMEs in Finland. Furthermore, companies in Northern Ostrobothnia had the highest R&D investment in relation to turnover in Finland in 2015 (Ministry of Economic A airs and Employment of Finland, 2018). Well-grounded financial support from the region is reinforcing its companies' booming potential, and a remarkably high number of new jobs in Finland are created by domestic SMEs (Herala et al., 2017). Northern Ostrobothnia's biggest challenge now is to respond to their needs with targeted education, new investment in the university and ensuring Oulu's attractiveness to an international labour force (Council of Oulu Region, 2018, interviews). A reallocation of responsibilities and active coordination of regional potential are also planned in the region's updated action plan for sudden structural changes. The action plan mentions a detailed plan for setting up a regional management group to coordinate and support the operational work of ensuring the region's capabilities, education, entrepreneurship and communication (Council of Oulu Region, 2018). Besides the large share of AIKO funding, Northern Ostrobothnia also receives sizeable resources from other national and EU funds (i.e. the European regional development fund and European social funds) to improve employment and increase regional competitiveness (Government Notice, 2018). These resources have been essential not only for enabling the region's resilience during the past technological shock but also for strengthening its potentials and directing it onto a more resilient development path. Compared to the EU and national structural funds,

		AIKO funding is a small-scale resource, targeted specifically at strengthening regional resilience and supporting innovative micro-projects for economic growth (Interviews or Interview 6 & 7). • **Resilience as a cross-cutting idea between the sectors** Besides the region's emphasis on the efficient combination of creative destruction and correctly allocated policy measures, our interviews high- lighted the region's resilience potential in terms of its smart specialisation strategy. The idea is to strengthen a region's resilience and companies' competitive ability by creating linkages between the ICT sector and traditional industries. Instead of creating a highly specialised high-tech cluster around one product, the strategy is to spread highly skilled capital across all the smart specialisation domains to find more valuable innovations. E-health is a promising example of this kind of development (Interview 4 & 5, University of Oulu, 2018). In addition to the strong ICT and software sector, the smart specialisation strategy focuses on health and wellness technologies and enhancing the basic industry's value chain. In practice, this means support for Oulu University's Health and Technology Centre (CHT), for example. The refinement of by-products of the agriculture and wood industries into new bio-based products and cleantech solutions is another area of growing possibility and interest in Northern Ostrobothnia. The region has 1369 dairy producers (2014 figures) and a long forestry tradition, and there is a good possibility of developing these traditional industries. **General findings:** The efficient combination of creative destruction and correctly allocated policy measures were the key factors for fast recovery. This was also a key message of our interviews in Northern Ostrobothnia in February 2018. An interesting finding was the excellent coordination between all levels of government – national, regional and local – in developing mechanisms to cope with threatening developments, particularly the way all levels were involved in the identification of potential risks, and how they led to concrete measures, incorporating them into the regional implementation plan and the structural change support system at a national level. More specifically, in the face of a real crisis, the key reason for the successful 're-bounce' of the high-tech sector and regional economy is largely attributed to the excellent organisation capacity of the public authorities through the Tar Group and the activation of a serious and far-reaching response. This also explains the importance of strong social networks, loyalty to the region and the hands-on attitude of the regional actors, including the business sector (Nokia in particular) and society at large, especially the people who lost their jobs but chose to stay in the region and set up their own businesses or re-educate themselves to fit the new demands of the labour market. In a 'central planning' tradition, one way of dealing with job losses and resilience after the closure of a major economic activity is to establish a new state-funded economic activity. The planned nuclear power plant in Northern Ostrobothnia and the creation of an innovative environment for start-ups and SMEs are perhaps the factors with most potential in creating new job opportunities. Also, by creating a buffer against potential risk related to commodity prices, Northern Ostrobothnia can be more prepared for commodity price variations within the mining, metal or forestry sectors. By investing in education and maintaining an innovative environment, the region can increase its social capital for dynamic conditions. Through a more diversified economic structure and the compartmentalisation of the high-tech and forest industries, the region can also counterbalance its over-dependence on certain demand groups and economic cycles.

2. VESTMANNAEYJAR (WESTMAN ISLANDS), ICELAND	Exogenous and endogenous (global and local) shocks and threats: Risk landscape- natural and environmental risks- volcanic, transportation interrupted by weather, Financial risk- small currency in a small economy/ quick to experience significant value fluctuations; a large proportion of the products and services are imported. This makes Iceland's economy quite sensitive to changes; Policy-induced risk/risk of losing income-generating activities/single-sector economy; Geopolitical risk/demand-driven risk; Risk of losing	To create new opportunities in such a narrow labour market, the local authority has established a **Knowledge Centre**. Its role is multifaceted, but it is designed to create knowledge about the community, provide opportunities for people to expand their skillset and promote innovative ideas. The operation is sponsored by the local authority and local companies, and is also supported by the provision of services and through cooperation contract and funds. The Knowledge Centre functions as a platform where its premises are rented out to organisations and companies in an endeavour to bring together multidimensional operations, for example in business, tourism, cultural activities and education. This creates a space for sharing and receiving ideas, and promoting discussion and innovation. The 'Ocean-Related Innovation' programme offered at the Knowledge Centre is an effort to increase diversity and raise educational levels on the island. The programme is a rural project and government-funded but developed and operated by the University of Reykjavík, offered on site in Vestmanneyjar, in Reykjavik, and through distance learning. The aim is to strengthen ties between academia and the fishing industry where students get the opportunity to work on real projects involving processing and the economic challenges faced by the companies. The fish industry is quite traditional, and new and innovative opportunities are often overlooked. New market niches, high- tech solutions, marketing and sales can enhance the potential of the fish industry, for example by maximising previously unused parts of the fish. Another initiative is the FabLab, which aims to re-engage young people by enhancing their education and providing social benefits. The FabLab was established in 2008, training young people in both hard and soft skills, and promoting innovation and a wider mindset. Additionally, since 2003 the Viska life-long learning centre has been promoting and providing education that is not offered in regular educational institutions. Viska is located in the Knowledge Centre and also provides facilities for distance learning. While educational options are considerable in relation to the size of the area, it remains challenging to acquire higher and vocational education on the islands. At the **regional level**, a Regional Plan of Action has been put in place by the Association of Local Authorities in South Iceland (SASS), which includes future visions, aims and concrete actions. Formally, Iceland does not count with an intermediate jurisdictional level (a region), yet SASS, of which Vestmannaeyjar is a member, provides the platform for addressing issues of a wider scope. In alignment with the National Plan for Regional Development, the regional plan defines the priority areas for the allocation of funds, particularly in projects related to employment, rural development and cultural affairs. The goal is to promote positive social development and strengthen the cultural affairs and competitiveness of each region and the country as whole. It is also meant to simplify interaction between the state and local authorities and to ensure transparency in the allocation and management of national funds, as well as shifting decision-making to local level. In this sense, the regional plans are a mechanism to strengthen the influence of the local authorities in Iceland (Association of Local Authorities in South Iceland, 2015). At the **national level** several activities have been put in place, mainly by the Icelandic Regional Development Institute, to monitor regional development in different parts of Iceland. The National Plan for Regional Development (2018–2024) approved by parliament in summer 2018 defines the national policy on regional affairs. The aim of the plan is to ensure equal opportunities for all citizens in terms of employment, services and living standards, and to promote sustainable development throughout the country. Emphasis is placed on areas suffering prolonged population decline, unemployment and lacklustre labour markets. The Icelandic Regional Development Institute audits and reports on the state of rural areas in Iceland. Status analyses were published in 2012 and 2014, and in 2016 an analysis was conducted for the country as whole. This is intended to be a foundation for the regional plans of action presenting future visions and priorities, a reference document providing an overview of different segments within the region, regarding

	income-generating activity.	infrastructure and different business sectors. The focus is on education, economic development, transportation, official services, primary processing, industry, support systems/mechanisms, international cooperation, and strategic planning for the Regional Development Plan. In addition, service surveys are conducted to evaluate inhabitants' access to services, population development forecasts for local authorities and analysis of income development in different business sectors. **General findings:** The risk landscape in Vestmannaeyjar includes factors that are inherent to the islands, such as location, transport, environmental and natural conditions, as well as the single-industry dependency. Moreover, other risks relate to wider social and economic trends, such as fluctuations in currency value, urbanisation and geopolitics. Some of these risks can potentially have shocking and even devastating consequences, such as volcanic activity, collapse of fish stocks, new tariffs and large fluctuations in currency values or commodity prices. Others are not abrupt but instead induce stress on the population, businesses and public institutions, which may also have long-term effects. Accumulated stress, including lack of reliable trans- port, lack of accessible higher education, limited labour opportunities, shortage of skilled work and outmigration, are perhaps the biggest threats for small regions such as Vestmannaeyjar. Stressors reinforce other stressors in a vicious cycle, reducing competitiveness, pushing more people away and hindering the development of new economic opportunities. Past experience has shown that the local community has an incredible capacity to recover from difficult and even life-threatening situations. The strong identity associated with the islands, and their highly praised cultural events and sports clubs, are some of the elements that combine to create the 'island spirit', which is how the community deals with the many challenges it faces. Nevertheless, there are several conditions, defined in this study as 'stress factors', that drive away many families despite the strong community attachment to the islands. Difficult transport conditions and the centralisation of services in Reykjavik, coupled with a trend towards urban lifestyles and creative jobs, results in many people moving away. However, some key measures are in place that to an extent counterbalance the effects of some of these key risks and stressors, particularly measures related to improving transportation and education, tackling the issue of a lacklustre labour market, identifying innovative, more creative job opportunities, and generally presenting alternatives to the otherwise narrow employment opportunities. Initiatives that approach education in a broader sense, as a platform for creating innovation in society at large, have great potential to increase the attractiveness of Vestmannaeyjar both for existing employees and for those who are entering the labour market.
3. ROGALAND, NORWAY	Exogenous and endogenous (global and local) shocks and threats- oil and gas crisis that hit Rogaland, a region in the south-western part of Norway in 2014.	The agility of the regional system in Rogaland became evident after the crisis in 2014, as new, ad hoc constellations were formed between various actors in the public and private sectors. Although funds were allocated to help the region get back on its feet, the regional actors were given the autonomy to restructure and rebuild the region, with minimal interference from the government: 'Both NAV3 and the county council and the municipality went above and beyond the boundaries of our typical role descriptions. [The government] let us fix it ourselves. And this is a very important lesson. The government must stay put. One needs to trust that the local actors know where it hurts and how to fix it.' (Interview 2) The next section illustrates the way the region responded to the disruption and challenges that followed the oil price drop. • Policies and the role of institutions • The government's pension fund • Creative and attractive region: a positive shock • Entrepreneurship and new opportunities

		• Investment in other sectors • Venture capital **General findings:** The risk landscape in Rogaland is heavily dominated by the oil and gas industry, and as a small and open economy both the sector as well as the region are vulnerable to an array of risks and potential shocks, such as commodity price shocks, technology shocks, geopolitical shocks and natural disasters. The absorption capacity of the oil and gas sector is perhaps the most challenging aspect for buffering against risks, exemplified in the rapid increase in unemployment in the months and years after the oil price shock. This highlights the need for effective coordination between regional actors, and the necessity of quick responses from the national level in bolstering the capacity of the regional authorities to act locally. The experienced diversification of the industrial sector is predominantly tied to the oil industry in the area, as investors were drawn to 'guaranteed' profitable return, which was detrimental to some of the smaller companies in other sectors. However, it should be noted that the economic structure in Rogaland is more diverse, but less attention is given to other sectors and the relative returns are often compared to those of the oil and gas sector. The oil price shock could be also considered as a positive shock despite its dire impact on the labour market, not only in Rogaland but also across Norway. It played the role of a catalyst for change and a wake-up call regarding costs and sustainable salaries. It also helped restructuring and reframing the branding of Rogaland county as a region with more to offer beyond oil and gas – as an 'energy region', a region of advanced technology and a hub for smart city-initiatives. The crisis also tested the regional actors' ability to cooperate and demonstrated the importance of close networks and the power of trust and symbolism. Moreover, it demonstrated the region's ability to take control of a situation and accurately prescribe the 'medicine' needed to alleviate the pain, albeit with financial support through state budgets and the flexibility of the national agencies to allow for regional autonomy over the organisation of work. The governments quick response and concern were also important factors for hindering an increasingly wide-spread crisis. As such, the plunge in the oil price was a necessary caveat for pointing out the vulnerabilities of the region, and it also lifted a veil on the impact and power of the changing discourse in the national and global arena regarding attracting new labour for the future, and the prowess and flexibility of the regional machinery. As former oil engineers changed career paths, it opened up the way to realise the possibilities within technology transfers and other sectors were able to capitalise on skills and knowledge not previously accessible to them. However, with oil prices on the rise and an industry that is more internationally competitive than ever, diversification of the economic base is a difficult balancing act. Companies are winning tenders again and Aibel in Haugesund will take on one of the largest constructions in the oil industry in a decade, the Johan Sverdrup platform, bringing 3000 additional jobs, a significant number of which will be based in the region (NRK, 2018; Regjeringen, 2016). The success of diversification depends greatly on the sector's ability to move beyond oil and gas in the low periods, and the ability to attract investment and employees to alternative sectors. As the oil and gas sector is rising slowly to its feet, the regional actors should not lose sight of their goal to create a more dynamic and resilient Rogaland county.

4. NORRBOTTEN, SWEDEN	Exogenous and endogenous (global and local) shocks and threats- commodity price fluctuations- employment drop, natural resource dependency, technological shocks.	Perhaps the biggest strengths in Norrbotten are the hands-on and collaborative working culture, which is evident both within the formal institutions and informally through the existing networks; and the open, problem-solving attitudes. As neatly put by an informant, 'we are a very proactive culture, we don't just talk, we are used to solving things, taking action' (Interview 4). Another informant adds: 'we are very much about triple-helix set-ups; we work in close collaboration with the public sector, the companies and the universities; it is something we are very good at, it works very well' (Interview 3). The closeness between people, partly due to the relatively small population, is a key facilitator for collaboration. As an interviewee puts it, 'key people are only one phone call away' (Interview 4). 'Top level people in the public sector meet with the companies at the different events, so there is a personal connection with a lot of people, which is very important for the region to grow' (Interview 3). An informant from the private sector adds, 'we have direct contact with the mayors, we can make things happen quicker than other places' (Interview 6). More- over, trust is an essential condition driving collaboration among regional actors (Interview 4). Another key resilience driver is the strong, dynamic innovation system present in Norrbotten, which is ranked among the highest in the EU. Some argue that this is driven to a large extent by the industries, which are highly advanced technologically and invest significantly in research (Interview 3). 'A large percentage of the research conducted in LTU is externally funded [by companies], and much of it is applied sciences, so it has a very strong impact on development, to industry' (Interview 2). Innovative industries are not limited to the high- tech sector, which is highly dynamic today, but also traditional industries such as mining, steel, paper and pulp, which are highly automated and globally competitive. For instance, LKAB, the state-owned iron-ore mine in Kiruna has announced that the next level in the mine will be completely human- free (Interview 1). The mining industry is also a forerunner in technological innovation in a broader sense, developing solutions that have a use beyond the sector, such as sensors used for monitoring land vibrations, and ventilation systems. The close collaboration among industries is also showing interesting results in terms of innovation, such as digital solutions developed by the tech industry and tested inside the mines more than 1000 metres underground, such as the 4G and 5G wireless communication technologies and drones (Interview 2). Moreover, good support systems from the public sector, finance and the university, in addition to the closeness to people and networks, are excellent conditions under which companies can thrive. 'There are grants given to companies from the region and incubators, where start-ups can find people to discuss about loans and how to plan the growth of the company' (Interview 3). LTU plays a particularly important role as one of the most collaborative universities in Sweden (ibid.) and in attracting talent. According to an informant, 'the university came in 1971 and drove an enormous change to the city – it's a big employer, does a lot of research, brings a lot of students – it has actually changed the demographic profile of the city' (Interview 5). 'Additionally, LTU is known as 'the' mining and ore university, this is really where the mining competence is concentrated – all the engineers, the geoscientists and companies are here' (Interview 3). The university also has a role in the space sector, with a branch in Kiruna that provides education and support to the European Space Agency (ibid.). All in all, the university plays a central role in the development of the region. According to an interview: 'The university in not only in the region but very much for the region' (Interview 2). Research and innovation is also a priority within the regional strategy in connection with the public administration and delivery of basic services (Interview 1). An informant asserts that: 'research and innovation within the public sector is becoming more important, so we are working closely with the universities addressing digitalisation, capacity building in the labour market, education, e-health' (Interview 4). Healthcare, for instance, is critical as people in the region are getting older, which means more people falling ill and fewer tax-payers. Thus e-health may provide some solutions to these challenges (Interview 1). At the same time, these changes need to secure 'good services and health- care for young people without raising taxes, as otherwise it won't be attractive, it won't be possible to live in certain areas' (Interview 4). Despite digitalisation threatening to generate job losses, Norrbotten generally has the opposite problem, with a significant labour shortage (Interview 1). Therefore, if Norrbotten is able to make a quick transition, it 'could gain a competitive advantage and sell services to other

		regions' (Interview 1). Youth capacity-building in relation to their long- term employability is another critical issue: 'Young people have it very easy in terms of employment, which leads to a problem in education attainment; they are not getting enough, or the "right education" (Interview 1). Therefore, Norrbotten's 2020 strategy emphasises the need for a labour force with the appropriate skills as central to assuring the 'region's competitiveness, growth and attractiveness', for which it puts the emphasis on more flexible education and life-long learning. On a different note, conditions that are normally considered as weaknesses, such as the cold weather, darkness and low population density, have also flipped into a competitive advantage for Norrbotten. 'Several car manufacturers have brought their winter testing facilities to sparsely populated areas, where you cannot have worse winter conditions, to test car parts [e.g. batteries, breaks] and performance', without encountering any 'paparazzi' threatening to reveal their new models to the media (Interview 2). 'This brings in money during the winter, mostly services, hotels, restaurants and know-how on running tests' (Interview 3). Likewise, Facebook installed its first data centre outside the United States in Norrbotten, partly because energy consumption for cooling servers is much lower in extremely low temperatures (Interview 2). Lastly, winter tourism is becoming more attractive. Winter sports, complete darkness, silence, astonishing landscapes, the aurora borealis and the Sami culture are some of the attractions gaining significant attention. Emerging efforts in the sector are being coordinated and promoted by Swedish Lapland, an organisation that is partly financed by the regional administration of Norrbotten. These efforts are showing positive results, although 'it is hard to know if travels are business- or tourism-related – there is a lot of activity in the hotel industry, but many come because of the mining industry or the car testing facilities' (Interview 4). The future of tourism looks promising, nevertheless. Energy security is another, most important reason why Facebook chose to build its data centre outside Luleå. The huge facilities used for the storage of digital information require vast amounts of electricity for cooling the servers. In addition, the servers must never stop, so energy security is crucial. Its 'positive path-dependence' played in Norrbotten's favour, since 'the whole grid is built for the processing industry' (Interview 3). 'Processing industries and mining require large amounts of electricity, and a safety net – that's why there has never been a power outage since the 1980s' (Interview 2). There is 'triple redundancy' in the infrastructure, as there are several hydropower stations nearby, so there is a high level of security (Interview 3). Additionally, not all areas in Sweden, or Europe, 'have sufficient power-capacity, and setting up the wires is very expensive; that's why it makes sense to be close to the power source' (ibid.). What's more, the renewable origin of the electric power gives a positive image to companies choosing to store their servers in Norrbotten. Hy- dro66, a company that rents out space for other companies' servers, has used this as a branding strategy, which is even reflected in its company name (Interview 6). Today, several other data centres have been established in Norrbotten, including a research centre on data centres. Finally, an interesting development for the future is that the region has started a process of scenario analyses, forecasting and examining trends, in preparation for the new regional strategy (Interview 1). In this case the higher risks already identified are the commodity price fluctuations of natural resources, including the forestry, mineral and steel industries (Ibid.). They are also looking into new opportunities and other industries that have the potential to expand, such as the data centres in which Norrbotten has an excellent competitive advantage in terms of infrastructure energy security and low temperatures (ibid.). **General findings:** Commodity price fluctuation is clearly the biggest threat to Norrbotten's economic and social resilience. A large proportion of employment in the region is dependent on the natural resources industries: 'If the world economy goes up and down, everything in the region goes up and down – we are very sensitive to commodity prices variations' (Interview 3). In this respect, a significant finding is the importance of buffering. Profits from natural resource extraction are highly fluctuating and dependent on global trends and geopolitics, and thus national or even regional actors are thus far from being in control. The situation could have become critical if the prices remained low for longer periods of time. Yet, the industry's high surplus allows it to save a large share of the profits as a buffer for times of significant price drop. However, apart from the large companies, the suppliers may not always be prepared for such times. Often the most affected during commodity price shocks are the companies down the supply chain, whose services are cut and that are not flexible enough to service other businesses or other markets. Looking closely to value chains, the impact of dropping commodity prices hits industries that are completely

		distinct from natural resource extraction. 'If there is a drop in the price of iron and LKAB was to slow down, then it affects ICT, they stop buying their services, they have to cut down. And if the price goes up, they also buy more ICT services, they replace old systems but better technology, so then there is a boom for ICT' (Interview 3). An interesting finding is that even though there is a single activity that hugely dominates the income generated in the region, diversification in employment is very important for job security, especially if it is not in any way connected to that activity supply chain. While some industries might not be significantly profitable, they provide some degree of security in cases when commodity price fluctuations affect the natural resources-based industries. Today, the mining industry in Norrbotten relies significantly less on human labour, and in fact LKAB, the state-owned iron-ore mine in Kiruna, has announced that the next level in the mine will be completely human-free. Luleå's employment depends more on services than basic industry. This means that, even if there is a big fall in commodity prices and overall GRP suffers a strong dip, the livelihoods of the region's citizens are less at risk because employment is less dependent on natural resources. Diversification, however, is geographically uneven. While creating room for the diversification of the industrial base is essential for job security, it remains a major challenge in places like Kiruna and other towns in Norrbotten that remain heavily dependent on natural resources in terms of both profits and employment. In this case, employing concepts such as entrepreneurial discovery processes (EDP) and allowing for related variety within the mining sector may provide some alternative job opportunities (e.g. ventilation systems, sensors, 5G technologies). As seen in Norrbotten, a good innovation system can provide significant opportunities in the long run and generate jobs that are not dependent on the extraction of natural resources, thus building a different future for a region that is highly at risk of abrupt events. Another important threat is the accumulated stress deriving from the negative demographic trends, ageing population, urbanisation, gender imbalances in education and labour opportunities, and unattractiveness. While none of these are shocking events, there is latent potential loss in competitiveness and economic opportunities, due to the struggle to find the right human capital. At the same time, loss of economic activities and insufficient diverse labour opportunities and other amenities in sparsely populated areas lead to further population decline due to outmigration. In this way, these negative trends become cyclical, representing a major threat in the long run. Norrbotten's extremely successful innovation system counterbalances to a certain degree some of these trends, particularly in its largest urban centres. Nevertheless, Norrbotten would require a significant demographic shift and much broader diversification of its industrial base to be considered resilient to commodity price shocks. However, this is not necessarily realistic within a short time- frame, particularly in specific parts of the region. In the long run, one thing that Norrbotten may consider is the possibility of planning for economic decline, which is a realistic scenario, at least for some parts of the region that receive most of their profits from finite resources. Despite these difficulties, a key lesson from Norrbotten is its incredible capacity to innovate and to transform weaknesses into opportunities and use path dependency to attract industries that can use existing infrastructures and capital.

5. VEJLE, DENMARK[2]	Exogenous and endogenous (global and local) shocks and threats	Vejle has a highly diversified economy, which makes it rather resilient to risks associated with individual sectors. Vejle's location is very strategic within Denmark and in relation to the rest of Europe, making it an important logistics node: 'This is an advantage for our companies, you can get anywhere in Denmark within two hours and to Hamburg within three' (Interview 2). Moreover, the labour force is highly qualified and said to be loyal in the sense that 'employees tend to move jobs less frequently compared to other places' (ibid.). This is interesting for companies, as they invest in training people. The city also has a strong business community and cooperative business culture. 'Companies are good at cooperating with each other, with external partners, the local authority, knowledge partners and so on' (ibid.). Despite the lack of a university in the city, the local authority and the Business and Innovation Park in Vejle, have close partnerships with universities across Denmark to attract labour to the city, through education projects, internships and job fairs (ibid.). At the same time, the local authority is promoting vocational career paths at school level, by showing teenagers the career opportunities that exist within those fields. To cope with the shortage of labour, one strategy is 'to integrate immigrants into the labour market, by showing them the opportunities offered in vocational fields' (ibid.). Re-education programmes are also important in assisting workers to move to different industries. Over time, Vejle's businesses and institutions have shown themselves to be quite adaptable to changing conditions. During the financial crisis, many became unemployed in Vejle; however, today the city has 'even exceeded the number of jobs compared to the pre-crisis numbers' (Interview 2). The Business Policy Consultant at Vejle Local Authority believes that 'businesses are quite resilient and adaptable; many businesses have been able to come back from the crisis within a few years of the crisis'. Moreover, the local authority has also shown its ability to adapt and be receptive to new ways of doing things. For instance, during the peak of the crisis, the local authority partnered with a private investor 'to build a Green Tech House, and Innovation Centre, to make Vejle an attractive place for new sectors, like green tech, that are growing'. Vejle is also increasingly supporting start-ups and emerging sectors by establishing new types of partnerships and working across departments within the public administration. This holistic approach by the public administration has been further reinforced by Vejle's involvement in the 100 Resilience Cities (100RC) network and programme organised by the Rockefeller Foundation. • **Developing the Resilience Strategy** Vejle city started developing its Resilience Strategy in 2014 and it was completed in 2016. The strategy is shaped by the 100RC's framework[3], and by identifying gaps in Vejle's existing approach to the city's resilience. The 100RC network provides support on how to strengthen Vejle's absorptive capacity or ability to resist and respond to shocks and stress. Departing from the assumption that the future is uncertain, the strategy recognises resilience as the interplay of a city's strengths, weaknesses, shocks and stresses, and how it responds to unforeseen events. Member cities in the 100RC are given the resources and support to develop a road- map along four fronts: the Chief Resilience Officer

[2] Vejle is the only Nordic city that has joined the '100 Resilience Cities' (100RC) network, a global network created by the Rockefeller Foundation in 2013. 100RC aims to help cities around the world to become more resilient to the physical, social and economic challenges they are facing. Vejle Local Authority submitted its application to the 100RC in 2015, in which it emphasised the city's experience in community building in vulnerable residential areas. Vejle is also interesting from the perspective of its risk landscape, as the city is highly diversified and to a large extent able to cope with risks affecting its economic structure. How- ever, the city is also coping with transformations in its labour market and technological, demographic, natural and political challenges.

		(CRO); the Resilience Strategy; an innovative platform; and a global network (Vejle Resilience Strategy). Cities receive funding and logistical guidance to appoint a CRO position in the city government. The CRO leads the city's resilience efforts by bringing in stakeholders from across silos of government and sectors of society. In this way, the CRO can be regarded as a tool in working towards resilience. Furthermore, cities receive technical support to develop a Resilience Strategy. The Rockefeller Foundation partnered with the design firm Arup to create the City Resilience Framework (CRF). The framework is based on extensive research and evaluation of cities' experiences around the world and reveals a set of factors that strengthen urban resilience. The CRF is an important tool in developing cities' resilience strategies. Cities also get access to the 100RC platform of private sector and NGO services to support strategy development and implementation, and inclusion in the 100RC network where cities share knowledge and best practices (100RC website). Once a CRO was appointed, Vejle developed its Resilience Strategy in partnership with the 100RC. As a first step, Vejle identified its key challenges through an extensive participative process involving not only the different departments within the public administration but also the citizenship at large including NGOs, businesses and housing associations. As the current CRO expressed: 'You need to know your challenges first, and know them well'. After distilling their core challenges, Vejle built a strategy based on the City Council's vision, 'Vejle – We Make It Happen', and its values of co- creation, innovation and sustainable growth. The Resilience Strategy was structured around four themes, or pillars: co-creation, climate resilience, social resilience and smart city solutions. These are explained in detail as follows. • **Co-creation pillar:** emphasises the need to work cross-sectorally in close partnership with different private and public actors to build capacity and develop innovative solutions. 'A co-creating city' includes actions to establish a Resilient Vejle Committee, which is responsible for monitoring the implementation of the strategy, coordinating the actions across the different stakeholders and raising any new challenges. Also, Vejle and the city's educational institution aim to develop strong educational, inclusive offers that benefit the most vulnerable groups as well as the most talented. This is in line with resilient thinking that embraces education. Also, more practical solutions, such as retrofitting communal halls into flexible meeting places fall under this pillar. • **Climate resilience pillar:** focuses especially on turning water into an asset and using it as an advantage for the city's 'urban and social capital'. This pillar also aims to make sustainable use of resources and further adopt renewable energy and green transport. 'A climate-resilient city' includes several actions targeting the risk of flooding, including a feasibility study to better understand the economic component of flood protection. Concrete actions to manage water are also designed to develop spaces for bringing the community together and to provide environments where people feel safe and in which they are proud to live. The Resilience Strategy also presents concrete actions to encourage more biking, better waste collection and community gardening, to name a few. • **Social resilience pillar:** focuses on increasing socio-economic cohesion, working closely with the citizenship, particularly the youth, to reduce the risk of polarisation, as well as with businesses to deliver 'better and smarter' services. 'A socially resilient city' includes actions such as West City, where social housing, the Spinning Mill (one of Denmark's largest development and innovation environments), FabLab (a digital fabrication, design and innovation training school for students) and several urban gardens are situated. A coordination group is to be set up to create ties between all the initiatives in place. One initiative is to develop platforms where citizens can actively engage and interact with each other to promote innovation, art and businesses. Four-year master plans are expected to improve the social housing environments in Løget (989 households) and Nørremarken (1061 households). These plans are aimed at strengthening social cohesion, stimulating economic growth and reducing the gap between neighbourhoods in Vejle. For instance, through the initiative 'Stair- ways Ambassadors', citizens help new residents to settle in with the aim of building

inclusive societies. This pillar puts particular attention on youth, improving their quality of life and providing them with opportunities, for example by targeting vulnerable groups (drug addicts, homeless youth, and young people with mental health issues). The 'SPOR 18' initiative aims to help young people to address problems such as loneliness, sadness, anxiety, sexuality and stress, while the initiative 'Through Fire and Water' builds self-esteem and confidence and instils a sense of community spirit by training vulnerable young people in firefighting skills. Furthermore, Vejle Local Authority has developed a set of actions to prevent radicalisation among youth. Depending on how a young person is acting, those concerned can respond according to a yellow, orange or red level (SSP Team Vejle). Immigrants and refugees are other important target groups. Discussion groups are to be organised where refugees and migrants can talk about current topics and practice their Danish. Several initiatives aim to improve opportunities to engage in sports, including setting up a Disability Sports Council. Another initiative is the annual award for the most inclusive businesses, which will encourage companies to integrate citizens in the labour market.

- **Smart city pillar:** builds on the need to embrace new technologies and digital solutions to improve the city's efficiency, create opportunities, support education and facilitate public access to services. '**A smart city**' involves actions for the improvement of digital infrastructure, or smart technology, such as wireless communications and sensors. Vejle aims to conduct a feasibility study into an intelligent traffic system and its contribution to a greener and better managed urban environment. Making data freely available is another way Vejle expects to support economic growth and ensure transparency. The city is committed to developing plans to include those who find it hard to navigate through the digital world. For instance, the initiative 'Vejle Digital School' prepares the younger generation for future, digital jobs. Even though the turbulent job market is one of Vejle's core challenges, there are no specific actions for the current work force to respond to the challenge. Job generation is, however, a potential outcome of many of the actions.

A fundamental principle for the strategy's four pillars was to 'integrate across the public sector and include citizens and businesses' (Vejle's Resilience Strategy). As many people are not familiar with the concept of resilience, Vejle evaluated the possibility of using a Danish term instead. This proved challenging, as an accurate translation of the word doesn't exist. Vejle instead chose to invite its citizens to define the world 'resilience' and what it means in the context of Vejle. As a result, the city produced a book titled 'Change the world for 50 kr' that contains a compilation of citizens' ideas of how to make Vejle a more attractive place to live. This illustrates the strong citizen participation in Vejle's work on resilience. Citizens are part of the implementation process as well, as they are important facilitators in many of the actions.
Vejle Local Authority also involved stakeholders in the strategy development process, but immediate connections to stakeholders (other than municipal departments) in the implementation process is vaguer. Vejle Local Authority is inviting partners to join the work on resilience. This has proved difficult, as there is limited funding for Vejle's work on resilience. For instance, there has been limited involvement by NGOs since they de- pend on members' funding. However, the resilience initiative has received a lot of attention from students and universities, which is especially important given there are no universities in Vejle.
Businesses are involved in Vejle's resilience work in many ways, even though economic resilience isn't a core pillar in the strategy. Vejle is collaborating with businesses, especially start-ups, through the Green Tech Centre and the city's Resilience House. There is also a 'Business Resilience Cup', an annual competition that challenges companies to find solutions to real problems. The event brings together start-ups, corporations and the 100RC with the aim of generating global impact, while focusing on climate change (rcbusinesscup.com).
In the implementation phase between 2016 and 2020, the strategy sets out to: create a resilient city and strong local communities; enable Vejle's businesses to create value from the Resilience Strategy; become an innovation laboratory for resilience; pioneer a progressive, co-creating and invigorating city management; and demonstrate how small 'provincial cities' can become the new pioneers in city innovation.
The implementation process includes realising the 100 actions listed in the strategy; establishing partnerships for resilience within Vejle;

		facilitating dialogue and engagement on the resilience agenda; engaging with 100RC and the platform partners; and institutionalising the Resilience Strategy. The Strategy, as stated in its co- creating pillar, is intended to be mobilising, bringing together stakeholders to address challenges and implement actions. Of the 100 planned actions, 41 are planned to be implemented before 2020, while the rest have a longer timeframe. The actions have 'owners' who are responsible for their implementation. The implementation takes place according to the action's time frame: short-term (within 2 years); medium- term (within 2-5 years); and long-term (beyond 5 years). Indicators to measure the implementation are not included. This is also linked to the strategy's purpose of mobilising stakeholders to develop initiatives that will implement the strategy. • **Resilience in practice** There are three main ways in which Vejle Local Authority has benefited from working with resilience. First, the international network provides knowledge and a global perspective. Second, cross-sectoral collaboration has enabled more collaboration between municipal departments. Third, resilience thinking has resulted in holistic solutions. **Strengthened cross-sectoral collaboration:** Vejle has not necessarily identified unknown challenges but it has learned to approach them through co-creation, involving several municipal departments and new partners. Developing a Resilience Strategy has supported resilience thinking in the public sector, while the private sector has also been involved. Furthermore, the co-creating way of working has strengthened collaboration between the municipal departments. Interviewees highlight that the high priority given to the Resilience Strategy by the City Manager is a key to successful implementation. From the beginning, there were objections to the strategy from some local politicians and different administrations. Strong leadership has been important in the process, leading to the situation today where the Strategy is being implemented. The City Manager in particular has been concerned with breaking down 'silos' and strengthening cross-sector collaboration within the local administration. This mindset was also important when projects such as the Green Tech Centre and the Resilience House were realised as public-private partnerships. The process of developing the strategy has particularly strengthened collaboration between the Environment and Planning Department and the Social Department, which has led to more sustainable urban development projects being implemented today. Notably, these development projects also include citizens in new ways. While cross-sectoral collaboration and citizen involvement is not entirely new, the resilience project has enhanced understanding of the importance of strategically al- locating resources to generate dialogue between the local authority and the private community. 'For instance, when we want to attract young people to choose a vocational path, we need to work together with business and the school departments – none of us can tackle that issue alone so we need to work together' (Interview 2). Vejle Local Authority works in close collaboration with the business sector and business consultants to identify ways in which the resilience project can be useful for them. Moreover, businesses seem to find it important that the local authority has adopted resilience thinking in its business policy to improve environmental sustainability, social well- being and successful businesses. • **The Green Tech Centre and the Resilience House – test and demonstration** The Green Tech Centre was established before the development of the Resilience Strategy as a 'light house for green technology in Vejle North' in 2014. It was established as a combined business park, testing and demonstration facility. The facilities were established partly with local authority funds and partly with private funds (the Kirk family/ owner of LEGO). It is a public-private organisation that includes triple-helix partners. The Green Tech Centre attracts approximately 6000 visitors per year from Denmark and abroad. Around 30 green profile companies rent office space at the Green Tech Centre. Together, the companies have more than 200 employees. The Green Tech Lab is a business incubator

		for start- ups, where businesses have access to testing, demonstration and prototype production facilities. The lab also attracts start-ups from outside Vejle and, for example, in some cases a business is based in Copenhagen but one of its employees or projects is based at the Green Tech Centre. It has become a hub for the development of environmental technology businesses. Private investors are connected to the centre, such as the owners of the Green Tech Centre, who invest some of their capital in young start-ups. The testing and demonstration facilities help the businesses to at- tract investments and grow. When they leave the lab, some of the companies choose to stay at the Green Tech Centre and rent office space there. The Green Tech Centre maintains an open innovation principle, which encourages networking and learning between triple-helix actors in the network. As part of the Resilience Strategy, another addition was made to the Green Tech Centre. The Resilience House, which opened in 2017, has close links to the climate resilience and smart city pillars. It is intended as an innovation and educational centre for the demonstration and commercialisation of resilient solutions within energy, climate, water and data. The Resilience House is home to 30 businesses and organisations (State of Green). It is also the office of Resilience Lab Denmark, a Quattro Helix cooperation between research and educational institutions, companies, authorities and users. Based on simulations of Vejle in 2050 and in close cooperation with stakeholders, Resilience Lab Denmark has modelled future incidents (i.e. risks and stressors). Risks are, for example, power outages, flooding, torrential rain and inter- net outages. Stressors include increases in water levels, quantities of renewable energy in the grid and quantities of data. • **Smart city – resilience facilitates more ambitious urban development** Smart city initiatives fall within the remit of Vejle's Department for Environment and Planning. The department has a long list of ideas for projects and has implemented several of these, some of them funded by a local authority fund for smart city development and some by the public administrations involved. According to the Head of Department, the process of developing the Resilience Strategy has made it possible to be more ambitious with urban development projects. With the development of the strategy, the different public administrations gained a better understanding of each other through discussions about resilience. This has made it easier to find common ground today in connection with urban planning and development projects. For example, the development of a new residential area, called Rosborg, has been in the pipeline for several years, but ambitions have changed with the introduction of the Resilience Strategy, under which the Rosborg development has become one of the strategy's lighthouse projects. The residential area will be developed on the current recycling site, which will be relocated. This site is based near the Ådalen stream, an area at special risk of flooding. In the preparation process, the local authority has involved investors, neighbours and citizens in how to create an attractive green residential area, through means such as workshops. The Resilience Strategy facilitates discussion with investors about the need to construct some- thing that will last longer and create life in the area. **General findings:** The 100RC network has shaped the understanding of resilience and ways of working in Vejle. Vejle has interpreted the resilience concept, recognising that Vejle must change or develop to a certain degree to adapt to new conditions, such as more frequent floods, emerging technologies and transforming labour markets. The strategy and its individual actions are, therefore, an attempt to address the challenges proactively and thus anticipate and prevent shocks rather than merely responding to them. In a way, this proactive approach attempts to turn Vejle's challenges into assets, for example taking advantage of water to improve the urban landscape and create cohesion, and using technologies to improve its competitiveness, service provision and social inclusion. Vejle represents an interesting example with which to study resilience as it provides a concrete interpretation of how to work with resilience at a local level. Vejle's involvement in 100RC has had an overarching influence on its policies and working practices, and has led to concrete projects, and initiatives. This has improved the results of projects and raised the awareness of the local population of some of the city's vulnerabilities. This

		last element is particularly important, given that citizens cannot fully rely on the public administration's ability to react to major shocks and that the individual actions of the citizenship are important too. In this sense, a society that is aware of the risks is better equipped to react to major events. Giving ownership of the process to the citizens by inviting them to provide input on what the issues are and what makes the city a better place, has been thought to be a key-way of creating awareness. Other factors that can strengthen their ability to cope with such events are social inclusion, digital technologies and education. It is particularly challenging to introduce holistic thinking when public institutions specialise in a particular field. Likewise, the citizenship at large has trouble connecting with the problems of the city as a whole when these problems may be far from where they live, or people cannot see how they can make a difference. Although Vejle did not pay specific attention to the risks associated to its industries or the overall resilience of its economic structure, the far-reaching exercise of identifying their core challenges has revealed some key threats to the city's economic and social wellbeing. This process of working with resilience appears to have being an important learning process and shows the potential to generate further reflection on how better to integrate the economic perspective into Vejle's resilience work.
Source: Giacometti, A., and J. Teräs. (2019). Regional Economic and Social Resilience, An Exploratory In-Depth Study in the Nordic Countries. NORDREGIO REPORT 2019:2.		

The Recovery and Resiliency Roadmap: A Toolkit for Economic Preparedness		
Case Studies	**Disaster/ Shock**	**Resilience Learnings/ Measures Taken to Increase Resilience**
1. Joplin, MO: Setting Economic Development Priorities Pre- and Post-Disaster	May 22, 2011, an EF-5 tornado tore a path roughly one mile wide through the southern part of Joplin, MO. One of the most devastating tornados in U.S. history, the twister killed 161 people, demolished 7,000 buildings (25 percent of the town), and leveled 530 places of employment, including Wal-Mart, Home Depot and St. John's Hospital. Despite the devastation, 420 of those 530	**1.Have a disaster preparedness plan for your organization and business community.** While cities and counties devise emergency response plans designed to save lives and property, the business community needs its own economic recovery plan. "First, you have to be functional yourself," O'Brian said. "While there are many good templates out there, every community needs to tailor their own plan according to their own needs and their own potential disaster threats." Because of its proactive disaster preparation, the chamber was ready to assist just a few businesses days after the tornado. Know how to effectively communicate with internal staff and external members: When phone and Internet connections go down, a backup communication method is needed. The chamber's plan designated emergency meeting locations and used SMS text messaging to communicate with its employees. It also had on le the cell phone numbers of key local business owners in case of an emergency. • Ensure that data is securely backed up in an offsite location: As part of its preparation plan, the chamber backed up its data in real time at a secure server over 80 miles away. This backup location will depend on the type of disaster to which your community is vulnerable – for example, communities that get hurricanes may need to establish a backup server in a different province or part of the country. This enables an organization to focus on more important recovery initiatives than retrieving basic business data. • Have a 501(c) (3) vehicle in place (able to accept donations and grants) before an event: Financial donations are only useful if your organization is prepared to accept them. Established over 20 years ago as a 501(c)(3) non-pro t, the chamber's Joplin Chamber Foundation was able to receive $800,000 in private donations to redistribute as short-term, low-interest working capital loans, which businesses needed after the disaster. **2.Conduct immediate outreach to the business community, with direct services.** With businesses in crisis, the Joplin Area Chamber of Commerce (JACC) needed to reach out to its members in those critical first few weeks after the disaster. The tornado had disrupted most technology-based communications, pushing the chamber to reach out face-to-face. O'Brian believes that the grassroots efforts to reach out to business owners played a key role in the success of bringing back businesses. "The personal touch was very important," he noted. • Move quickly in a direct, personal way to understand business needs: Within a week of the tornado, the chamber staff walked the streets to reach business owners and discuss their plans to rebuild and recover. They were able to do this because other chambers in the region sent their staff to man the offices of the JACC. By circling the destroyed area day in and day out, staff made contact with all 530 employers within three weeks. While many business owners were too shell-shocked to share their plans to stay and rebuild, they appreciated the personal outreach, and most stayed in close contact with the chamber. Knowing that they were not alone, that someone cared, and that someone was in charge with a recovery plan made employer more willing to rebuild. • Quickly establish a one-stop shop for business recovery needs: The chamber immediately set up a business recovery centre at its offices, where the Small Business Technology Development Centre office and a business incubator already were located. They invited

	businesses have reopened. There is much to learn from the preparedness and quick response of Joplin's citizens and businesses to work towards recovery. Rob O'Brian, president of the Joplin Area Chamber of Commerce, cited **three key factors in his community's approach to addressing disaster.**	representatives from relevant groups – such as the SBA and IRS, which have disaster assistance programs for businesses – to set up there as well. The centre was able to offer technical business advice, as well as assistance in applying for low-interest loans. • Set up and appropriately staff an information hotline: Rumors and misinformation can sabotage recovery efforts, particularly when a community can't rely on usual media channels to dispel false information. The chamber dedicated several staff members to answering calls from businesses about utility restoration, cleanup, business services, rebuilding efforts, and other practical matters. Disseminating consistent and accurate information in the weeks after a disaster can make a difference in whether businesses choose to return and rebuild. **3.Quickly establish a strategic planning process for economic recovery and engage all business stakeholders.** Every community needs an economic recovery plan that addresses the new realities of the disaster's aftermath. While it's important to plan quickly, no plan is effective without buy-in from its constituents. The Joplin Business Recovery and Expansion Initiative (JBREI) Advisory Board was established two months after the tornado to lead business recovery efforts, serving as the economic development leadership of the broader Joplin Area Citizens Advisory Recovery Team (CART), a citizens group charged with overall community recovery efforts. The JBREI Advisory Board partnered with consulting rm Market Street Services to establish the building blocks for short-term business recovery. Thanks to the chamber's personal business outreach, they effectively engaged many of the business owners in focus groups as part of the planning process, gaining a better understanding of business owners' needs and expectations. For example, with the elimination of a supply chain or the exit of a major buyer, the direction and character of a post-disaster economy can change quickly. Knowing where businesses stand and being prepared with the right information allows them to adapt to new market realities.
2. **Building Capacity for Economic Recovery and Preparedness in Alberta**	Natural disaster-floods in Calgary	The Economic Disaster Recovery Program was launched by Economic Developers Alberta (EDA) in partnership with the British Columbia Economic Development Association (BCEDA) to provide flood-impacted communities in the Calgary region with a series of practical economic recovery resources. The program received the support of volunteer teams of economic development professionals from across Canada and the United States. EDA engaged 10 impacted areas in the Calgary region for the EDRP, including the four that were documented in this case. These communities were responsible for selecting leads that invited key stakeholders to participate in the consultation process. EDRP teams then completed reports for each community with recommendations based upon focus group and business walk discussions. Discussions with businesses were intended to focus on a five-minute survey but transformed into emotional, hour-long discussions in heavily impacted areas. The program benefitted these communities with limited implementation capacity by providing expert and realistic recommendations. Recommendations emphasized the importance of gathering the right business contact information, building cross-sector relationships, and conducting economic disaster recovery planning. The summary EDRP report can be downloaded at http://www.edaalberta.ca/EDRP-Summary-Report

3. **Addressing Full Spectrum of Economic Recovery- 2008 Cedar Rapids Flood**	Natural disaster- flood	**Providing Avenues for Collaboration between Various Parties** In the face of this disaster, representatives from different programs and government organizations quickly established the Emergency Operation Centre (EOC). Representatives from the city, provincial, and federal government and local and regional non-profits utilized this centre by dividing up tasks and collaborating to solve important problems. The chamber of commerce was invited to have a seat at the EOC in order to facilitate better communication between the public and private sector. Priority One, a regional economic development organization serving Cedar Rapids and the Iowa City Technology Corridor, could communicate information it learned directly from its business clients to the EOC and vice versa through this representative.63 This real time information ow alerted the EOC to emergencies and critical situations in the eld.64 In the days after the flood, the city manager recognized the need to establish alternate means of communication and brought together key community leaders, creating the Recovery and Reinvestment Coordinating Team (RRCT) one week after the ood crested. Realizing that the problems caused by the ood could not be solved by just one group, the team consisted of a variety of members: the chamber, local non-profits, arts and cultural groups, schools, organized labour, landlords, the Downtown District, local government, and neighbourhoods. The RRCT met daily in the first eight weeks engaging businesses and neighbourhoods, and gathering input on recovery actions. The RRCT worked with Iowa Jobs (I-Jobs) to obtain grants and worked on the allocation of CDBG funding. Furthermore, the RRCT worked with the Corps of Engineers on ood mitigation efforts. Most importantly, however, was the RRCT members' ability to periodically compare notes on what was learned and what was still going on. This communication allowed for a more codified response by the Cedar Rapids community, acting together to resolve issues caused by the flood. Collaboration was not limited to local government and non-profit organizations. Just five days after the flood, over 500 business owners met at a local union hall to determine ways to help one another. Originally, they sought to form a clearinghouse for equipment sharing, allowing businesses to access the tools and office space needed to assist in their own recovery. However, leaders of this group realized that it was going to take more than equipment to revive many of the impacted businesses. This group quickly transformed into the Cedar Rapids Small Business Recovery Group (CRSBRG), creating a uni ed voice for small businesses and communicating business interests to the local, provincial, and federal government. **Reaching Out to Local Businesses** Priority One and the Cedar Rapids Chamber of Commerce effectively maintained communication with businesses in a time of crisis. Immediately following the flood, Priority One and the chamber built upon its database of local businesses' contact information, adding cell phone numbers to ensure communication even when phone lines were down. Texting and contacting clients in the early morning and late at night ensured businesses could be reached despite damaged or overloaded cell towers. Priority One used the information it obtained to figure out the real time needs of its clients and to pass along information to the re department or the EOC. Priority One maintained its calls to client businesses for a few weeks following the flood. The City of Cedar Rapids sought to engage the business community in their recovery plan. In the few months after the flooding, the city held three open houses to identify problems, to develop options to address these problems, and to create solutions. A critical component of this was to involve the businesses in the city's redevelopment strategy, since businesses had been greatly impacted and their successful recovery impacted the community's recovery. These efforts led the city to redevelop residential and commercial area, while also deciding to keep certain areas from redevelopment for future flood protection.

		Dispersing Information to Businesses through the Web The RRCT also worked to ensure a healthy ow of information to the public. In collaboration with the Chamber, United Way, local IT companies, and other organizations, RRCT built a website with up-to-date information on flood relief and other recovery efforts. The site, www.corridorrecovery.org, was up two days after the flood and collected information from on-the-ground-sources, the provincial, and FEMA. It also provided a venue to coordinate volunteer efforts. The website was extremely beneficial to many organizations that were unsure about how to approach the recovery process. **Contacting Other Communities** In the wake of the flood, the City's first response was to contact other communities. The City understood the importance of information that could be gained from cities that had similar experiences, from Napa Valley to Grand Forks. These efforts helped develop a framework for how to go about recovery, from developing business recovery programs to creating an "interdisciplinary and cross-functional approach" to problem solving. **Supporting Local Business Recovery through Capital Assistance** After the flood, Cedar Rapids businesses needed working capital to pay rent, compensate employees, buy supplies, and finance other operations in order to keep their businesses open. To fill this void, Cedar Rapids businesses received grants and other assistance programs funded by non-pro t organizations, and the city, provincial, and federal government. To date, more than $68 million has owed into Cedar Rapids to assist in business recovery efforts. **Helping Businesses to Keep Doors Open through Financial and Technical Assistance** Funding to assist businesses sprang up from both the local and provincial level almost immediately. By the 1st of July, the Chamber established the Job and Small Business Recovery Fund, contributing $500,000 from its own fund. The chamber was able to leverage different private businesses and donors through matching donations. The City and Priority One also helped pool resources for emergency assistance. The chamber distributed a total of $6 million to small businesses to help them "meet payroll [and] pay for clean- up, and other disaster expenses." In total, 411 businesses accessed these $25,000 zero-interest forgivable loans through an application process run by the Chamber. Without access to this emergency funding, many businesses would have had to close their doors. This funding stream later ran into problems with federal funding because it was seen as duplication of bene ts. The chamber, city, and Business Case Management team worked with federal programs to ensure that businesses could access the federal funding. **Summary:** The recovery efforts in Cedar Rapids helped the city far outperform the dismal 45 percent three-year national business survival rate. This success was due to the concerted efforts of a unified business community and local government support. Cedar Rapids came together as a city to respond to the immediate needs of its business community, not waiting for state or federal assistance to arrive. Local and regional organizations, from the chamber of commerce to Priority One, provided necessary assistance to the businesses in Cedar Rapids. Where funding or information gaps were recognized, grassroots movements started by the businesses themselves stepped up to fill those voids. The programs and initiatives Cedar Rapids devised helped keep businesses open as well as retain businesses in the city. One of the most unique and successful aspects of the recovery was the dynamic case management approach to business recovery that provided direct mentoring to identify the individual needs of businesses, helping businesses outperform recovery odds.

4. **Building Back a More Resilient Community in Greensburg, Kansas**	Natural disaster-tornado	**Sustainable Planning with Strong Economic Development Strategies** ***Long-Term Community Recovery Plan*** Prepared through FEMA's Long-Term Recovery Program, a twelve-week planning process began three months after the disaster to develop a Long-Term Community Recovery Plan (LTCRP). This process involved a variety of stakeholders — citizens, civic groups, business owners, and government officials at the local, state, and federal level. A total of four community meetings were held with attendance averaging about 400 people. The positive impacts associated with rebuilding Greensburg in a sustainable manner included reductions in long-term financial expenses, and the creation of a unique identity that serves as a tourism draw. By blending past tourist attractions into a new sustainable living model, Greensburg hoped to attract an increasing number of tourists that would stay longer and pump more dollars into the local economy. The LTRP also outlined vital action steps for developing a comprehensive economic development plan. Its recommendations included a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, an assessment of community assets, an evaluation of business sectors and leakage, strategies to bene t current small businesses, and an assessment of the need for both a tourism director and an economic development director. ***Developing a Sustainable Comprehensive Plan*** After the LTCRP process ended in August 2007, the planning team began a longer process to develop a more comprehensive plan with stronger focus on future economic development strategies. After six months, and with assistance from private and government consultants, the process culminated in a plan titled the "Greensburg Sustainable Comprehensive Plan" (GSCP), also known as the Sustainable Master Plan. The GSCP planning team was committed to community support and engagement, and as disagreements arose, thorough evaluation was conducted to ensure the proper decisions were made. Phase 1 of the GSCP was adopted on January 22, 2008 and consisted of broad goals intended to guide future rebuilding efforts, infrastructure evaluation, land use mapping, and preliminary housing policies. Phase 2 was adopted on May 19th, 2008 and updated Phase 1 with more refined information. It also expanded the GSCP's focus areas to include economic development, cultural resources, and energy planning. Greensburg identified a great opportunity to build upon the media attention focused on the town's commitment to sustainability. By building upon green tourism efforts, Greensburg could develop this into a larger industry that could draw much-needed dollars to the local economy. The GHCP also recommended leveraging the town's LEED-certified buildings as part of an effort to attract "green collar" entrepreneurs for its local business incubator. Additional plans to further develop Greensburg's economy include building an industrial park, upgrading its airport, and assisting local businesses in creating small-scale commercial operations. ***Establishing a Business Incubator*** Originally identified as a goal in the Long-Term Sustainability Plan, the project was targeted because of its potential for high recovery value. Recommendations for launching the incubator included developing criteria for small business inclusion, engaging design professionals developing small business technical assistance with Kansas Small Business Development Centre, and hiring a staff person to provide project and program support.

		Built and owned by the city, the project is designed to help entrepreneurs by offering a workspace with modest rent. The incubator concept comes with an understanding that the entrepreneur is expected to eventually leave. The facility is at capacity, having attracted 10 lifestyle entrepreneurs. At least two businesses have graduated from the incubator and begun operating independently: a coffee shop and a glass-making gift store. The incubator is funded through multiple sources. Steve Hewitt testified before Congress and was successful in his request for USDA Rural Development funds to help build the incubator to LEED Platinum standards. Hewitt also brought his case to several corporations, eventually securing additional funding from Frito Lay. Finally, actor Leonardo DiCaprio, whose production company oversaw a reality show about Greensburg, personally covered the remaining expenses. Building to the high LEED standards posed a new challenge for local contractors. While the demands were costly and time consuming, the construction of the LEED Platinum building provided valuable skills that workers carried over to many other construction projects in the town. ***Building Capacity for Business Recovery*** The committee mentioned above was chaired by the Estes brothers and Scott Brown, and used Brown's Auction House as an office. Operating entirely on donations from local businesses of time, money and labour, the BRC connected local businesses with each other and to government agencies and funding. They eventually formed a 501(c) 3 called Kiowa United. The corporation collected local donations—but never any government funding—to construct the Kiowa United Building 18 months after the disaster. The building was constructed quickly and inexpensively, but still ascribed to green building standards. It offers affordable rent to businesses, some of which graduated from the business incubator. As of 2012, Kiowa is at capacity, housing 13 local lifestyle businesses. The BRC is now known as the Greensburg Chamber of Commerce, which continues to work closely with KCDC. The Chamber provides inexpensive marketing services to its members and acts as a liaison between the business community and local government. **Summary** Greensburg's recovery efforts, now five years in the making, focused on resiliency by building back stronger and more sustainable and by working to diversify and grow the local economy and reverse the trend of population loss endemic to small agricultural towns. The resolve of local residents, business owners, and public officials, coupled with assistance from multiple funding sources, demonstrate that in the wake of disaster can lay new opportunity. Thanks to creative visioning and calculated risk-taking on the part of its citizens, the winds of change now appear to be blowing in Greensburg's economic favor.
5. **Restoring Tourism Assets-Charleston, SC after Hurricane Hugo (1989)**	Natural disaster-hurricane	***Cooperating on a Regional Level*** As tourists are drawn to attractions regardless of municipal lines, a central component in Charleston's marketing efforts was regionalism. Charleston CVB represents nine different jurisdictions, including Charleston County. These groups worked together to form a recovery task force as well as to pool funds for regional marketing. Promoting the region provided a synergy that offered tourists the best possible range of activities. For instance, visitors can explore the cultural appeal of Charleston's historic downtown and cross over to one of Charleston's barrier islands to enjoy its beaches. The CVB determined that in regional marketing, the whole is often greater than the sum of the parts.

		Proactive Leadership from both the Public Sector and Community One of the main factors that shaped the recovery process in Charleston was proactive leadership. Mayor Riley worked to coordinate recovery resources and to maintain an active presence in front of the media—local, regional, and national—to provide accurate information and to promote the city and the region. The CVB president also provided strong leadership in coordinating the "We're Going Strong" campaign and in working with local leaders to remove obstacles to tourism. In addition, industry volunteers were critical in organizing the task force and maintaining momentum in the guidance of recovery efforts.
6. **The Economic Recovery of Grand Forks- After the 1997 Red River Flood**	Natural disaster- flood	***Efficiently Using HUD CDBG Funds*** The economic recovery of Grand Forks was made possible largely because of the city's access to and efficient use of federal funds, the most prominent of which was the Community Development Block Grant (CDBG) assistance provided by the U.S. Department of Housing and Urban Development (HUD). The impacts of this disaster, which left the vast majority of the community effectively homeless and unemployed, enabled the city to work within the community poverty and hardship guidelines attached to the use of these funds. With over $171.5 million in CDBG money awarded to it within three years of the disaster in 1997, the Grand Forks community was able to finance a number of recovery initiatives that helped restore the city's economy in the long term. CDBG funds were used to partially finance a $410 million flood protection system, directly providing $10 million in assisting businesses, various gap financing uses to help to secure loan funds, purchasing strategic city properties, funding repairs, and even in hiring personnel to help plan the recovery, among other uses. ***Establishing an Organizational Structure for Economic Recovery*** From the very beginning of the post- flood planning efforts in the spring of 1997, civic leaders almost invariably viewed Grand Forks' economic recovery as a critical issue to be considered within the broader context of the community's overall recovery. While the restoration of basic infrastructure would dominate immediate recovery efforts, the economic revitalization of Grand Forks was planned with short-term and long-term recovery phases that were related to other significant aspects of the community's recovery. The coordinated nature of the community's recovery efforts is evidenced by the city's post- flood organization, overall recovery strategy, the communications operations employed, and the major initiatives undertaken to restore Grand Forks' economy. In April 1997, Pat Owens, the mayor of Grand Forks, recognized that critical technical expertise in addition to a substantial amount of federal aid was necessary in order to be able to plan and implement a successful recovery. While Mayor Owens (referred to by many as "America's Mayor" at the time of the flood and re) was a personable public figure who had the skill set necessary to enlist the support of the federal government in terms of acquiring a significant amount of financial assistance, both she and a number of federal officials (including officers from HUD) astutely recognized the fact that she lacked the technical expertise to comprehensively administer the recovery effort. **Tri-Chairs** Mayor Owens promptly appointed a "Tri-Chairs" committee of civil servants to respectively oversee the financial, public works, and community planning aspects of the recovery. The mayor and her council deferred heavily to this committee of three, which collectively had the authority to manage the city's recovery related resources. Another function of the Tri-Chairs committee included the authority to set the agenda for recovery. Agenda items included setting prioritized goals and proposing steps and potential funding sources in order to achieve those goals. While in the first year following the disaster, the Tri-Chairs worked fairly closely together, in subsequent years the Tri-Chairs worked more independently as both the city's recovery goals and their respective responsibilities became more precisely defined.

		Business Redevelopment Organizations The city's business community was a willing and proactive participant in the economic recovery process because its leadership recognized the importance of having its concerns addressed as well as the importance of lending its expertise to the recovery process. Within days of the disaster, a group of prominent Grand Forks business leaders approached the mayor in order to volunteer their services with respect to the community's economic recovery effort. The Mayor's Task Force on Business Redevelopment was quickly convened with a membership of 15 prominent businessmen. These leaders relied on their experience in order to identify key issues to be considered during the recovery, which included eliminating bureaucratic recovery obstacles, workforce development and retention, the acquisition of funding access for business recovery, and the planning of the city's downtown area, among others. This task force held regular meetings for approximately six months after the disaster, at which point it was reformulated as the Downtown Development Commission. While the Mayor's Task Force on Business Redevelopment focused mainly on economic recovery planning during the critical early months following the disaster, the Downtown Development Corporation which succeeded it was largely focused on the ongoing long term implementation of the city's efforts as they related to the revitalization of the all- important downtown area. **Developing an Economic Recovery Strategy** The Tri-Chairs committee and city officials generally agreed that the foundation of the community's recovery was based on three critical priorities, in order: flood protection, population retention, and business redevelopment. The events of 1997 demonstrated that without a reliable flood protection system in Grand Forks, the possibility of retaining the population and sustaining a vibrant community for the long term was very low. Dependable infrastructure as well as a significant workforce and tax base was necessary prerequisites in order for a healthy and sustainable city economy to exist. During its meetings in the spring and summer of 1997, the Mayor's Task Force on Business Redevelopment identified three priorities of economic recovery. The first priority was redeveloping the downtown area, which was inundated by floodwater but perceived to be the heartbeat of the city and the necessary focal point of future commercial and retail activity. The second and third priorities were to retain small business as well as the manufacturing sector, both of which were significant components of the city's pre-flood economy and compatible with the collective skill set of the community's population. Beginning in the fall of 1997, the Downtown Development Corporation (DDC) succeeded the Mayor's Task Force on Business Redevelopment, and began working on a plan to implement the priorities for economic development by focusing on the revitalization of the downtown area. Important considerations that needed to be resolved included the amount of the downtown area that could and should be salvaged after the disaster, and how best to program the salvageable downtown area to stimulate commercial and retail activity. These considerations would depend on the location of the flood protection system and its components. The flood protection system planning process, led by the Army Corps of Engineers (ACE), would last three years until the official plan was finalized in 2000. **Business and Labour Retention** In order to enable as many local firms to stay in business as possible, a variety of assistance measures were used by the city. While all uninsured businesses that were adversely impacted by the flood were potentially in need of some assistance, smaller businesses that were not equipped to capitalize on the reconstruction boom were particularly vulnerable. While big box retail stores and many types of construction related firms were given limited or no assistance, a significant amount of assistance was made available to other small businesses with the use of CDBG, SBA, and EDA funding. CDBG money was used to offer existing businesses up to $20,000 in disaster assistance loans to continue operating; it was also used to back SBA funds, which provided low interest loans to businesses as well as homeowners. Additionally, a $2 million EDA revolving loan fund was made available.

		CDBG funds were also used to create public works projects, which had a beneficial effect on the economy on multiple fronts. For example, a number of volunteering religious organizations were offered housing when CDBG funds were used to purchase a closed hotel building. The hotel was turned over to the religious volunteers, with the city paying for laundry and other minor expenses, and the new facilities enabled the number of working volunteers to substantially increase the amount of free labour provided to the city. A separate investment of CDBG funds helped to enhance the physical state of the city with the creation of $10 per hour cleanup and repair jobs. These jobs were of critical importance because they helped to keep the labour force in town, and eventually, with the improving infrastructure and available labour, small businesses found Grand Forks to be an increasingly viable location to conduct business. Industry was also supported with the creation of a major retention facility. The Noah's Ark industrial business retention centre was created using $2 million in HUD CDBG funds with $5 million in EDA funds. The large capacity industrial building housed displaced small businesses in Grand Forks until 1999. Another $2 million in HUD CDBG funds would be invested in a 120,000 square foot industrial park with 30,000 square feet of incubator space. While a full recovery was years away, within six months of the disaster, basic infrastructure and services were restored to the community and business rebounded in many industries (although retail and service industries were still crippled). Instead of the 20% or greater rate of depopulation feared for Grand Forks, only 3% of the city's population was lost in the years immediately following the flood. ***A Stronger Grand Forks: 1997-2007*** Despite the many challenges it faced, the city was ultimately successful in implementing its economic recovery strategy. By the time the flood protection system was finally completed, the city's economy was clearly growing and diversifying, as the population of the city proper and even the enrollment of the research-intensive University Of North Dakota both surpassed pre-flood levels well before the ten-year anniversary of the flood. Before 1997, the city's downtown was vulnerable to flooding, much of the downtown area was turned away from the river and the downtown retail and commercial sectors were sluggish. The new Grand Forks features vibrant retail and commercial areas that take full advantage of the river's scenery. Moreover, citizens and potential investors can now breathe easy during the spring thawing season due to the flood protection system, and businesses can now invest in the city with more confidence. Before the flood, many potential tourists considered Grand Forks to be a drive-through city on the way to Fargo. The city's Greenway, which is comprised of 2200 acres of land that had to be “sacrificed” for the creation of the flood protection system, has helped to establish the city as a tourist attraction. Many visitors from Winnipeg, Manitoba (Canada) and other cities that would formerly pass through Grand Forks or only make short rest stops on the way to Fargo now see Grand Forks as a legitimate destination in its own right. These visitors enjoy the public amenities the Greenway has to offer (including its camping areas, golf course, and park space) and now pump an estimated $70 per person per day into the local economy, often extending visits to two or more days. The city efficiently used its funding to retain the population and businesses, and with wise investment and strategic rebuilding, it gradually led its city to the “new normal” state repeatedly and consistently referred to by public officials. By 2000, overall employment and aggregate revenues were growing at a faster rate than immediately before April 1997. Service industry employment surpassed pre-flood levels in 2002 and restaurant and retail employment met pre-flood levels four years later. The CDBG and EDA funded industrial park, as well as other incentives, bore fruit with respect to the manufacturing sector. In 2006, the industrial sector in Grand Forks, which traditionally benefits from the research activity of the University of North Dakota, the defense related activities

		associated with the Grand Forks Air Force Base, and the presence of companies such as turbine blade manufacturer LS Glas fiber, reached a historic peak in jobs by accounting for over 4000 employees within the city. ***Summary*** The economic recovery of Grand Forks following the 1997 Red River Flood was possible because in the critical early stages of the disaster, Grand Forks was able to secure a significant amount of federal funding as well as the technical assistance and organizational structure necessary to be able to efficiently leverage its resources for the immediate and long term benefit of the community. With the use of creative financing techniques and strategic investments of its CDBG funds as well as other sources of assistance, the city was able to retain its residents and businesses while it transformed itself into a safer, revitalized and more economically diverse community in the long term.
7. **Neighborhood Revitalization Post-Disaster, Czech Village/New Bohemia**	Natural disaster-flood	**Marketing Vacant Space and the Neighbourhood for Redevelopment** One way to fight the increase of vacant properties post-disaster in an already vacant property-saturated area is through increased marketing efforts such as property tours. CV/NB Main Street, in partnership with the historic preservation group Save CR Heritage, advertised in various media outlets the opportunity for tours of vacant properties in the district. Attendees included developers and the general public and raised awareness of the available properties and the redevelopment progress of the neighbourhood. Another additional notable project was an effort between CV/NB Main Street and the local cable company, OnMedia. CV/NB Main Street negotiated to provide discounted commercials to neighbourhood businesses. Additionally, before these commercials aired a blurb about the district appeared, bene ting both parties. **Learning from Partnerships** CV/NB Main Street also benefited by learning from cities that reached out to them post-disaster. The city of Minot, North Dakota, experienced similar damaging floods and post- flood contacted the city of Cedar Rapids offering to share their experiences. Leaders of the Main Street Program learned tips about working with FEMA and experiences working in a recovering government. They also learned how to work with funding shortages when it comes to immediate relief. The director of the Main Street Program noted this was very useful and said it helped prevent “reinventing the wheel”. **Summary** The revitalization of the Czech Village/New Bohemia Main Street District has taken many efforts from various agencies and is ongoing. A significant part of successful flood recovery efforts has been the individual, incremental impacts of many different players that, working together toward a common goal of revitalizing this district, make a monumental difference. CV/NB Main Street’s primary role to seek available resources that make it possible for these individual, incremental projects to happen by helping fill in the gaps has been a valuable asset. All of this provides a sense of place and, by creating a revitalization strategy, CV/NB Main Street is ensuring continued growth within the desired guidelines for the district in its journey from an industrial declining neighbourhood to a thriving arts and cultural district.
8. **Economic Diversification-San Fernando Valley 1994**	Natural disaster-earthquake	**Pursuing an Economic Diversification Strategy** ***Establishing a Public-Private Partnership for Economic Recovery*** A key group of Valley leaders from both the private and public sectors saw the need and opportunity to unite the recovery efforts of existing groups in the community. After the earthquake, U.S. Secretary of Commerce Ron Brown met with local leaders who determined that the best course of action was to form a new umbrella organization. This initiative was launched with a $350,000 planning grant from the Economic Development Administration

Northridge Earthquake		(EDA). The grant would fund the development of a collaborative economic development strategy to respond to the many economic shifts the region was experiencing. The new organization would oversee the strategy and ensure its continuity. The founding leaders brought to the table the first four partner organizations of what became the Valley Economic Alliance (VEA): the Valley Economic Development Centre, the Valley Industry and Commerce Association, the United Chambers of Commerce, and the Small Manufacturers Association. When the first VEA CEO was hired in 1996, he also recruited the San Fernando Valley Conference and Visitors Bureau (CVB), the Valley International Trade Association, the Southland Regional Association of Realtors, and the Valley Leadership Institute. Gaining regional participation was crucial to the process. Prior to the VEA, four Valley cities – Burbank, Calabasas, Glendale, and San Fernando – competed with each other and had uncooperative relationships with the city of Los Angeles. However, VEA leaders continued to emphasize the need for a true regional economic alliance, eventually winning the full support of these cities and formally adding them to the group in 1997. The VEA took on the form of a 501(c) (3) not-for-profit economic development and marketing organization. Its formal mission is to work with public and private stakeholders to grow and sustain the economic base of the San Fernando Valley, as well as to improve the quality of life in the surrounding five-city region. The VEA is governed by a 150-member general board of directors, 33 of whom also serve on an executive committee led by a chairman, president, five vice chairs, a chief financial officer and a treasurer. The VEA has an annual operating budget of approximately $1.4 million, all of which comes from investor donations, special projects and events, and foundation grants. ***Developing a Strategic Plan to Guide Economic Recovery*** The VEA brought together a large number of community stewards to devise a vision for a strategic plan. The planning phase began in 1995, and the plan was put into action the following year when the first full-time CEO was hired. Although VEA leaders contributed a good deal to the plan, they focused on capturing the community consensus. This was crucial to the plan's success because community leaders needed to feel a sense of ownership in the plan in order to make a stewardship commitment. The ensuing report, Economic Alliance Partnerships for Progress, outlined a strategy to expand further into entertainment and information services, the Valley's fastest-growing industries. The hospitality industry and small businesses also became prime targets. The plan included five initiatives, each with an assigned vice chair, including: • Workforce preparedness, • Industry retention and expansion, • Business in the community, • Government relationships, and • Small business assistance. **Developing the Plan** **Prepare the Workforce for New Opportunities** The plan advocated forming separate task forces to assess workforce issues for the entertainment and information industries (including finance, insurance, and business services). It also recommended setting up a Business Education Partnership with the Los Angeles Uni ed School District, high schools, vocational training programs, community colleges, and California State University-Northridge (CSUN) to coordinate with businesses in developing relevant educational programs. The partnership encouraged businesses to expand their internship and mentoring programs as well.

		Connect Business Retention, Expansion, and Attraction The plan suggested recruiting volunteers from Valley businesses to serve on public-private business retention teams. These teams worked with at-risk companies and contacted all Valley businesses over a certain employee threshold to encourage them to stay in the Valley. In addition, the teams did business attraction work. The plan recommended working with the CVB to develop marketing materials targeted at specific industries as well as prospective residents. The material included competitiveness data and highlights of the economic health of the Valley. **Tend to the Local Environment for Business** In keeping with the strategic plan, the VEA created business-community forums to foster discussion of common issues. These can take place in the form of town hall meetings or a town council. To address the issue of crime reduction, for example, the plan recommended setting up neighbourhood watch programs, marketing the Valley's positive image regarding safety, and organizing a coalition to influence safety and crime laws. **Facilitate Accessibility to Services** The Valley is home to a high proportion of entrepreneurs. The VEA set up a Valley Government Business Centre, a streamlined resource for business permitting, regulation, and information. A special advisory council was recommended to interface with government on regulatory reform. The plan also recommended forming a special task force to address the legislative concerns of home-based businesses in particular. **Develop Specific Programs to Grow Core Industry Sectors** The plan advocated setting up a Small Business Assistance Centre to provide one-stop, full-service management and technical assistance, as well as business and entrepreneurial training to local businesses. Another crucial step involved developing a small business revolving loan fund and securing an additional $10 million EDA grant for this fund. The plan also proposed conducting a feasibility and planning study to establish a New Media Technology Centre to serve as a business incubator, demonstration centre, and after-school centre for high school students interested in technology. Lastly, the plan focused on nurturing small manufacturers by developing a Manufacturing Enterprise Network to provide small manufacturers with timely information on regulatory issues, changing technologies, peer-to-peer problem solving, and other resources to maintain global competitiveness. **Results** As the VEA carried out the plan, it began to see successes. The Valley's long-standing aerospace workforce offered transferable skills that were relevant to other types of high-tech manufacturing. New technologies, bioscience, and clean/green manufacturing increasingly replaced the departing aerospace industry. These smart technologies, based on intellectual capital, are less sensitive to jurisdictional disadvantages than traditional manufacturing. The relocation of the MiniMed research and production facility to the CSUN campus is touted as one example of the VEA's success. CSUN's non-pro t auxiliary, the North Campus Development Corporation (NCDC), was tasked with developing 65 acres on the university's north campus. NCDC worked with economic development officials and a local investor philanthropist to facilitate a public-private deal that relocated MiniMed to a 504,000-square-foot building on campus. This proximity to campus fostered a close relationship between the university and the facility. MiniMed collaborates with university faculty on research projects and offers student employment through work-study programs, internships, and scholarships. The VEA continues to evolve economic development strategies and to increase collaboration in the region.

		In 2001, the VEA developed Vision 2020, a set of growth goals for the following 20 years. Vision 2020 was supported by private funding and focuses on market-driven economic development strategies and civic and leadership initiatives. In 2009, Los Angeles County brought together more than 1,000 stakeholder organizations to create the county's first consensus strategic plan for economic development. Local leaders also recently launched a San Fernando Valley Council of Governments, which engages the five local city governments on issues of planning, transportation, and economic development. **Summary** The Valley's entrepreneurial culture contributed to a proactive response to the earthquake. Locals took it upon themselves to guide the rebuilding without relying on intervention from the outside. "What this Alliance has always done is filled out the blanks, smoothed out the surfaces, and made things happen," said a founder. The public-private partnership that created the VEA leveraged the crucial assets of both worlds. In order to maintain global competitiveness, the private sector needs to drive the public debate and maintain relationships with decision-makers. To effectively address workforce issues and to develop a strong economic base, the public sector needs to actively engage the private sector. The Valley's recovery efforts, as well as long-term economic diversification, hinged on the partnership between public and private organizations across jurisdictions and industries. The result was collaborative brainstorming, dedicated implementation of the plan, and maximized funding mechanisms. Through this collaboration, VEA leaders succeeded in creating momentum in the Valley that continues to this day.
9. **Growing from within Post-Disaster: The St. Louis County Best Practice**	Economic decline and flooding	**Convening an Economic Adjustment and a Diversification Committee** In 1990, there were no regional organizations with economic development capacity in the St. Louis region. Realizing that the defense cutbacks were starting to affect the region beyond just St. Louis County, Denny Coleman called leaders of economic development, workforce development, human services, business, and universities as well as elected officials from surrounding counties in both Missouri and Illinois and invited them to come together to develop a regional response to the cutbacks. The support of the county executive, the mayor, and the regional chairperson of the Chamber of Commerce encouraged these leaders to be a part of the Economic Adjustment and Diversification Committee (EADC). Leaders from both outside and inside the region needed to come together, because many of the workers lived beyond the county, making the impact widespread. Because the workforce development boards were organized by county, many of the board members had never met or spoken to officials outside their county. By bringing everyone together, the response was united regionally. The committee initially met once a month and, in subsequent years, once a quarter. Some of the subcommittees were more active than others and lasted longer. In the end, EADC lasted around seven years. New groups were created and met on their own terms. Members of the EADC realized that a regional organization was necessary, leading to the development of Greater St. Louis Inc., a regional economic development network located within the St. Louis Regional Chamber & Growth Association. ***Assessing Damage and Developing a Long-term Strategy for Recovery*** In order to respond to the defense cutbacks, the community had to do damage assessments and create a long-term recovery plan. Rather than create strategic plans, programs, and grant requests separately, the EADC, through the administrative support of St. Louis County Economic Council (SLCEC), worked with both the U.S. Economic Development Administration (EDA) and the U.S. Department of Defense Office of Economic Adjustment (OEA) to provide funding through one grant request. The committee created one list of recommended studies and plans, and the committee and SLCEC worked with both agencies to see which studies they could fund. In the end, the grants covered nine research studies including: • A long-term economic diversification plan • A survey of displaced workers that was completed three times

- A survey of defense contractors in the region (major sector)
- A survey of the McDonnell Douglas Corp.'s subcontractors
- A survey of the region's global programs and initiatives
- An understanding of what financing programs for businesses were available on the federal, state, and local levels

EDA grants were used in St. Louis County from the EDA grant funds in order to:

- Establish a revolving loan fund
- Create a job training program for the manufacturing industry
- Expand the functions of the St. Louis World Trade Centre
- Create the Centre for Emerging Technologies

McDonnell Douglas was very helpful to the EADC. As part of their assistance, they provided the contact information of all of displaced workers to the committee to conduct a survey. The survey of displaced workers was unique, because workers were surveyed three times over a period of four years. By surveying the workers multiple times, the EADC was able to track the displaced workers and have a better idea of the impact of the region over a longer period of time. This survey was first conducted by E. Terrance Jones, a professor at the University of Missouri, St. Louis, and one year after the first round of layoffs instead of the typical three- to six- month time block. Interestingly, the majority of the displaced workers decided to remain in St. Louis or returned

Funding Growing Businesses

The St. Louis region is often faced with the challenge of helping growing businesses obtain capital when they are no longer able to borrow from banks, friends, and family. In discussions, there were comments made about being located in the Midwest, as venture capital is not always as readily available as it is on the coasts.

In 1994, St. Louis Development Corporation (SLDC), St. Louis County Economic Council and the Economic Development Centre of St. Charles County received a one-time $1 million grant that has been recycled over the past eighteen years. Additional funding is added annually through community development block grants from the U.S. Department of Housing and Urban Development. One of the first companies to receive a loan from the revolving loan fund is now ranked in the top 150 on Forbes Largest American Private Business list.

Fast forward eleven years later. In 2005, the St. Louis Regional Chamber and Growth Association (RCGA) established a membership group of private investors. The St. Louis Arch Angels memberships provides local entrepreneurs the seed capital that they need to help grow companies locally. The network was established as a 501c3 organization that is managed by a private board of directors.

Growing the Plant and Life Science Sector in St. Louis County

The plant and life sciences cluster has been exploding in St. Louis County with new programs and resources available to drive research and innovation. In 2008, the first building of the Bio-Research and Development Growth (BRDG) Park opened at the Danforth Plant Science Centre. This new park will be a three-building initiative focused on the plant and life sciences. The Nidus Centre, a non-pro t biotechnology incubator, has since relocated to the BRDG Park with BRDG taking over the leases and activities for the current tenants. BRDG Park offers wet lab space, office space and on-site workforce training in the plant and life sciences. SLCEC's Helix Centre is located next to the BRDG Park.

Vicki Gonzalez, managing director of Nidus Partners, has created a new solution to getting technologies out of the research stage and into commercialization. A partnership is created with local corporations who invest in the partnership. Once a quarter, they meet and review potential

		technologies to invest in. As a bene t for their investment in Nidus Partners, the corporate partners get first opportunity to review the technologies and decide whether or not to invest in them. A strategic technology council made up of executives from the corporate partners uses their knowledge and experience to advise on global market needs and select and de- risking selected technologies. Once a technology is chosen, it receives full support through their growth and commercialization process. This partnership was started in 2010 and continues to grow. **Training Workers** In 1994, St. Louis County received a $4.5 million grant to establish the Metropolitan Education and Training (MET) Centre in Wellston, MO. This training centre was opened in an area faced with poverty, severe disinvestment and inadequate infrastructure to train low-income residents with short term training programs and other resources to enter into the workforce. The MET Centre was established through a partnership of public, private and non-profit organizations to train workers to enter in advanced manufacturing, biotech, healthcare and digital technologies. The centre is training workers for a future in high technology industries. A former Wagner Electric Plant, the land was contaminated and vacant for several years. It was a cornerstone partnership that came together to renovate the building and pursue environmental cleanup. Serving over 9,500 citizens since 2006, the MET centre has received additional grants from EDA to expand. **Competing in a Global World** Prior to the defense cutbacks, St. Louis County had purchased a franchise of the World Trade Centre. It had a small staff. At the time of the studies, the EADC found that the franchise was not realizing its full capabilities. The research studies also showed that the region needed to compete better globally, and small and medium enterprises needed assistance entering into the export economy. Many of the larger corporations already had the assets and abilities to compete globally. A grant from EDA was used to expand the world trade centre staff and services for small and medium size enterprises. Once the grant ran out, the expanded staff and services were funded locally. Following the 2008 floods, St. Louis County worked with EDA to receive a grant for $1.725 million to create a hub for the Midwest for U.S. and China commerce with the goal of driving exports and creating jobs. **Summary** St. Louis County has had its share of disasters—both economic and natural. Though each disaster requires a different response, they are all robust and strategic. From the 1990s, officials learned that responses are not just local to the county but impact the entire region including both sides of the Mississippi River. The St. Louis Regional Chamber and Growth Association remains active in economic development initiatives. Entrepreneurship continues to be a strong focus for St. Louis County and the region. The four enterprise centres' current clients and graduates (as of 2009) had revenues of $165 million, 809 full time jobs, and a success rate of 80%. As with the Helix Centre, new incubators continue to be in planning. Future incubators include focuses on the fashion and high technology industries. New incubators have also continued to open in the region, including one focused on the arts. The asset map currently being created will unlock the next direction of entrepreneurship strategy.

Source: Economic Developers Alberta. (n.d.). Recovery and Resiliency Roadmap: A Toolkit for Economic Preparedness. Economic Disaster Recovery Project. Retrieved from https://bceda.ca/docs/The_Recovery_and_Resiliency_Roadmap_-_A_Toolkit_for_Economic_Preparedness.pdf