

Keeping Local Economies Safe: The Role of Economic Development Plans in Hazards Resilience

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Abstract

When communities suffer the impacts of a natural disaster, damage to the local economy can keep the community in a state of crisis long after the disaster itself. Although this threat has considerable implications for communities, it is unclear which organizations or entities have the responsibility and capacity to address economic vulnerability to hazards. Economic development and emergency management are often isolated from each other, resulting in emergency plans that do not serve the business community as well as they might otherwise, and economic development plans that do not address business needs related to disasters.

One way to think about strengthening the local economy and reducing its vulnerability to disruption from hazards is through the lens of resilience, or the ability of a system to anticipate, absorb, recover from and adapt to stresses. This study explores the potential role of economic development plans in addressing the resilience of local economies to natural hazards. Through the evaluation of ten economic development plans from a three-county region and supporting interviews, this study analyzes how well economic development plans currently address economic resilience to hazards, and how they might address it in the future. The results indicate that economic development plans have an overall existing alignment with resilience principles that can be built upon both within the plans themselves and through supporting activities.

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INTRODUCTION

When natural disasters strike a community, lives can be lost and property is often damaged or destroyed. In addition to these highly visible losses, support systems can suffer damage, making it harder for the community to recover and thrive in the future. One system that can have a tremendous impact on recovery is the local economy. The entire system of businesses, resources, and relationships is needed to meet the community's need for goods and services, employment, and vitality. One way to think about strengthening the local economy and reducing its vulnerability to disruption from hazards is through the lens of resilience. Resilience is the ability of a system to anticipate, absorb, recover from and adapt to stresses (Church, 2013).

This study looks at how economic development plans can enhance the resilience of their local economies to natural hazards. It is difficult for any one entity to influence the local economy as a system, because it has so many interconnected and autonomous elements including businesses themselves, regulatory agencies, markets, and economic development organizations. While concerns about the local economy, such as recessions and unemployment, are clearly within the scope of economic development work, natural hazards are more frequently associated with emergency management. Working with the intersection of these two areas can be a challenge because professionals in the areas of economic development and hazards planning tend to be isolated from each other. Without plans that take both areas into account, local economies can be left vulnerable to disruption and impeded recovery from natural hazards.

Purpose

This research explores the role of economic development plans in enhancing the resilience of local economies to natural hazards. Economic development plans map out strategies for strengthening the local economy, typically with regard to number and type of industries, employment, and infrastructure. Traditionally, they do not address natural hazards and their potential impacts on the business community. However, as a major tool for public sector influence on the private sector, it has the potential to include such threats as a public concern. In fact, the United States Economic Development Administration has recently added resilience requirements to certain planning efforts, supporting the notion that economic development has a role to play in planning for hazards (EDA, 2015). This research strives to evaluate economic development plans as a tool for increasing resilience to hazards by:

- Developing metrics to analyze economic development plans for resilience elements
- Identifying barriers and opportunities for addressing economic resilience to hazards through economic development plans

This project also identifies recommendations for planners, economic development professionals and emergency managers to overcome barriers and increase local economic resilience.

Economic Development Context

Economic development plans come in many different forms. This project works with four types of plans – regional, county, city, and port – which are described in more detail below. All plans in this study come from a three-county economic development district (EDD) in Oregon. EDDs are multi-county entities that plan for economic development at a regional level. Each EDD creates a comprehensive economic development strategy (CEDS) according to regulations and guidance by the US Economic Development Administration (EDA). These plans present data about the state of the regional economy, and identify strategies through partners from the public, non-profit and private sectors to strengthen the entire region.

County-level economic development plans come in many different varieties. This project looks at three different types of county plan. The county comprehensive plan is a regulatory document addressing a range of state goals, including economic development. This plan is created by the county government and approved by the state land use department. The second county plan is an aspirational plan, which presents a vision and opportunities in a non-binding format, and was developed by a consortium of economic development and government partners. The third plan is developed by economic development organizations as a collaborative effort regarding their joint activities and is self-implemented.

City level plans for this region were all economic opportunity analyses (EOAs) created by city government or consultants to inform the city comprehensive plan. In Oregon, the EOAs identify the amount of land needed to support economic growth for the city. The state Department of Land Conservation and Development approves EOAs and comprehensive plans.

Port authorities prepare economic development plans in the form of strategic plans. The port districts are major economic development organizations for coastal communities, and their strategic plans lay out their anticipated initiatives for the next 5-10 years.

Within the greater context of economic development, there are more entities than those creating the public plans described above. Economic development players that were not evaluated in this study include non-profit organizations such as chambers of commerce, educational institutions such as community colleges, and individual businesses. Many of these organizations did contribute to the development of the plans in the study, however, which tend to be highly collaborative in nature.

Project Overview

This research project uses the analysis of ten plans from a three-county economic development district and interviews with professionals who contributed to those plans to answer two primary research questions.

1. How well do economic development plans currently address economic resilience to natural hazards?

2. How might economic development plans address economic resilience to natural hazards in the future?

I developed the analysis criteria by adapting the Stockholm Resilience Centre's Resilience Principles and plan quality analysis as developed by Philip Burke. In my literature review, I frame economic resilience in theory and practice, and explore the foundations of the analysis criteria. The methodology chapter details how the analysis was conducted. I lay out the results of my research in the findings chapter, and synthesize them in the implications chapter. Finally, I summarize the research and present potential next steps in my conclusion.

LITERATURE REVIEW

Resilience has become a popular term in recent years, frequently associated with sustainability. What people mean by resilience is far from unified, however. The term is used differently in different fields, and has had a variety of meanings over time. Resilience has been used as a description for mechanical properties, personal qualities, ecosystem attributes, and aspects of communities.

This study focuses on economic resilience, which is a particularly recent application of the concept. While the amount written about economic resilience is expanding tremendously, much of what currently exists is based in professional practice, rather than academic research. This section will review both theoretical and practical explorations of economic resilience, and how they provide a foundation for this research.

Economic Resilience Theory

D.E. Alexander provides a particularly thorough history of the uses of “resilience” tracing it from its Latin root through modern adoptions of the term. He points out that the prominence of the word resilience has much to do with C.S. Holling’s use of it in the field of ecology, its use in general systems theory and social-ecological work, and the social sciences. Alexander suggests that when resilience was applied to communities, the problem of reconciling the different meanings became much more notable (Alexander, 2013).

Economic resilience is one aspect of community resilience, and as such, struggles with a common definition. Disaster resilience is another aspect of community resilience, which has had considerably more written about it. One framework that functions well across areas of community resilience is the capacity to anticipate, absorb, recover and adapt to a stress (Church, 2013). This framework parallels the disaster mitigation cycle of prepare, respond, recover, and mitigate with a more holistic approach.

Broadly speaking, there seem to be two ways of analyzing resilience: with a specific focus and through broad principles. Carpenter et al. framed the specific focus approach as a question of resilience of what and to what (Carpenter, 2001). For any given application, you might specify the system in question – resilience of what? This is particularly useful when speaking of community resilience, because so many systems (economic, social, and physical – both built and environmental) go into a community. The second element in this tactic is to identify the stress – resilience to what? As with systems, stresses can be economic, social, or physical, and each stress can be addressed through different strategies.

Many organizations have proposed principles of resilience, including the Rockefeller Foundation (Ove Arup, 2014), the RAND Corporation, and the Stockholm Resilience Centre (Simonsen, 2014). There is considerable overlap between the organizations as well as differences. The frameworks also vary in terms of complexity and the type of system that they are focused on. This approach

to resilience provides a way to think about common elements of resilience beyond a specific system/stress interaction.

Economic Resilience to Hazards

In his work with economic resilience, Adam Rose distinguishes between “static” and “dynamic” economic resilience. Static economic resilience allows the system to absorb a shock while maintaining function, while dynamic economic resilience allows the system to recover functionality swiftly after a shock. He focuses on functionality as the flow of commerce, as opposed to the physical damage caused by disasters. Rose also distinguishes between inherent resilience - elements in play pre-disaster, and adaptive resilience - behaviors that emerge post-disaster (Rose, 2014).

Rose uses a quantitative approach to measuring economic resilience in comparison to a predicted worst outcome. These analyses led to a consideration of various tactics and their cost effectiveness for building resilience. Rose also suggests that certain inherent elements of the economy, like individual businesses, supply chains, and market forces for allocating resources, are “highly resilient” by nature. However, he does note that the wide variety and interdependence of economic sectors “makes resilience all the more difficult to measure and influence in the desired manner” (Rose, 2014).

Rose distinguishes resilience from mitigation in ways that are at odds with other frameworks. He suggests that resilience is implemented after a disaster, while mitigation is implemented beforehand (Rose, 2014). This is a rather large departure from suggestions that communities can build resilience before disasters strike, as pursued by the Rockefeller Foundation and others (Ove Arup, 2014).

Another approach to economic resilience is to equate it with the economic concept of hysteresis. Ron Martin describes hysteresis as the phenomenon when an economy shifts into a different state or trajectory due to outside forces. In Martin’s work, he is particularly focused on recessionary shocks as the stress on the economy, as opposed to natural hazards. In this framework, resilience would be the process that allows a community to respond to hysteresis in a positive manner (i.e. a shock that prompts increased productivity and prosperity). Low resilience or lack of resilience would result in decreased productivity and prosperity after a shock (Martin, 2012).

Opposing Views

There are certainly researchers who find resilience to be a less than useful tool when applied to economics, or social systems in general. David Hassink suggests that resilience is not particularly useful as a concept with regard to economics because: 1) it focuses on equilibrium and multi-equilibrium, 2) it neglects the state, institutions and policy, and 3) it neglects social and cultural factors towards adaptability (Hassink, 2010). This is based on a particular emphasis on economic adaptability as the issue of interest. Many views of resilience, including Martin’s, do use equilibrium as a foundation, but the concept of adaptation and learning are also prevalent. With regard to Hassink’s second objection, the scope of resilience

studies is always challenging, because they work with a systems framework wherein all elements are interconnected. Limitations must be put in place to keep studies cohesive, but the state, institutions and policy are clearly important players in local economies, and can be incorporated into the resilience concept. Finally, social and cultural factors can also be incorporated into resilience, as long as they are identified within a study. The fact that they are not commonly considered with regard to economic resilience is again a factor of the interconnectedness between systems, and the necessity to narrow the scope of any study.

Debra Davidson expressed reservations about the application of resilience to social systems in general. One concern reflects the potential conflicts between resilience in one aspect of a community and another, such as social resilience strategies that compromise environmental resilience. Davidson's concept of resilience is based primarily on the ecological framework proposed by Holling and colleagues (specifically Panarchy), including a focus on equilibrium states and cycles. Like Hassink, Davidson notes the importance of cultural factors in pursuing different resilience strategies. Davidson's reservations stem from the differences between ecological systems and modern social systems, particularly the highly connected nature of our globalized society (Davidson, 2010). These researchers raise key differences between ecological systems and social systems that require attention. Later in this chapter, I examine frameworks developed from a socio-ecological perspective that address these issues.

Economic Resilience in Practice

In addition to the academic work being done around economic resilience, many organizations have explored best practices from the standpoint of economic development and planning practitioners. These publications provide an on-the-ground perspective that compliments the theories presented above.

Economic Development

The United States Economic Development Administration (EDA) has recently put a much greater emphasis on economic resilience. According to the Institute for Business and Home Safety (IBHS), at least one in four businesses will not reopen after a disaster (IEDC, 2014). Two initiatives of particular note are a report written by the International Economic Development Council (IEDC) and funded by the EDA with strategies for economic recovery and resilience, and the introduction of resilience requirements in the development of Comprehensive Economic Development Strategies (CEDs), which are approved by the EDA.

Leadership in Times of Crisis: A Toolkit for Economic Recovery and Resiliency is a publication aimed at economic development organizations. Of the many players that can influence economic resilience, this choice of audience reflects arguments made within that individual businesses resist engaging directly with hazards resilience due to other responsibilities and priorities. Economic development organizations have a broader mission, while still having direct relationships with businesses that allow them to influence their actions. This document makes many recommendations about the role that economic development organizations can

and should play in enhancing resilience in their communities. Some key recommendations included:

- Planning for their own continuity of operations to ensure that they can serve businesses in a disaster
- Developing relationships with local emergency management to build trust and have business interests represented in response and recovery plans
- Becoming familiar with disaster grant opportunities before a disaster strikes
- Using disasters as opportunities to build communities and neighborhoods better than they were pre-disaster
- Serving as a connection point between businesses and various levels of government and the media
- Providing support for businesses to develop their own continuity of operations plans
- Planning for both preparation/resilience and recovery (IEDC, 2014)

Beyond providing best practices, the EDA is now requiring that economic development districts include economic resilience elements in their Comprehensive Economic Development Strategies (CEDS). The EDA states that “in the context of economic development, economic resilience becomes inclusive of three primary attributes: the ability to recover quickly from a shock, the ability to withstand a shock, and the ability to avoid the shock altogether (EDA, 2015).” This definition is similar to Church’s elements of anticipating, absorbing, recovering, and adapting to stress, or in this case, a shock. “Recovery” is mentioned in both definitions, and “withstand” and “absorb” are similar concepts. The EDA’s concept of “avoiding” includes elements of “anticipating” and “adapting.” While the CEDS guidelines are flexible, they do include both pre-disaster elements to build resilience and post-disaster elements focused on planning for recovery. The guidelines also point to existing CEDS that can serve as examples for other economic development districts (EDA, 2015).

Planning

The American Planning Association’s has published Planning Advisory Service Reports that address the connections between resilience to natural hazards and economic development. One report notes that economic recovery is “one of the most critical goals of hazard mitigation” because local economies provide the financial base from taxes that support local recovery efforts. It also calls on planners to involve economic development professionals and business owners in mitigation planning both to inform and gain support for projects to protect the community (Schwab, 2010). From a recovery perspective, economic developers and other private sector representatives can be represented through advisory groups, emergency support functions, and policy consultation. Local business communities face many issues after a disaster, including business resumption, workforce retention, and the image/branding of the community. There are also opportunities to use rebuilding resources to further long-term goals of the community (Schwab, 2014).

Nancey Green Leigh and Edward J. Blakely address economic resilience both in terms of acute shocks and stresses that build up over long periods. The characteristics that they consider important for a resilient community apply to people, organizations, resources and community processes. Leadership, community involvement and attachment, cooperation, and self-reliance are associated with resilient people. Organizations should be diverse and work collaboratively. Local ownership and diversity are key characteristics of resources. Resilient community process includes planning with follow-through, citizen involvement, and a community-wide vision (Leigh, 2013).

The first planning approach to resilient economies provides strategies for connecting economic development with hazard-oriented fields. The second approach presents a way of categorizing different aspects of the community that are relevant to economic resilience. These perspectives complement traditional economic development practice and the academic research on resilience.

Adapted Frameworks

In order to move from theory to methodology, I selected specific frameworks to adapt for the purpose of this study. The frameworks addressed both plan quality broadly and resilience principles specifically. The specific adaptation of each framework is addressed below in the methodology chapter.

Planning researchers propose that the quality of plans is correlated with their effectiveness. Burke et al. used six principles of plan quality in their assessment of coastal state hazard mitigation plans, which were adapted from a wide range of earlier evaluation criteria. The principles focused on the elements of 1) goals, 2) fact base, 3) mitigation policies, 4) implementation and monitoring, 5) inter-organizational coordination, and 6) participation (Burke, 2012). The mix of content and process criteria for evaluation provides a broad assessment of plan elements without being exclusively applicable to a single type of plan. This framework then provides a strong foundation for the evaluation of the variety of economic development plans in my research.

Given the wide array of interpretations of resilience noted above, I chose a framework that was focused on the social-ecological systems of our communities, and adapted it to the specific arena of economic resilience to natural hazards. The Stockholm Resilience Centre's principles of resilience provided this foundation. The seven principles are 1) maintain diversity and redundancy, 2) manage connectivity, 3) manage slow variables and feedback, 4) foster complex adaptive systems thinking, 5) encourage learning, 6) broaden participation, and 7) promote polycentric governance systems (Simonsen, 2014). For each principle I applied the lens of economic development and hazards to narrow the scope to criteria that an economic development plan might meet within its stated purpose. Thus narrowed, these principles remained flexible enough to account for a wide variety of policies that supported resilience, regardless of the intent of the plan contributors.

Literature Conclusions

Resilience as a concept has been adapted and refined to fit the needs of many different fields. Whether these definitions will converge or continue to be distinct is uncertain. Consensus on the meaning of resilience has yet to be established even within the bounds of some fields, including community planning, emergency management and economic development. Multiple studies can be used to complement each other and identify new perspectives from which to consider resilience.

Existing economic resilience studies tend to focus on what the definition of economic resilience is and how best to enhance it. This study looks more specifically at who might implement different strategies, and what the barriers and opportunities are for such initiatives, with particular focus on public sector influence through economic development plans. My research seeks to address some of the concerns presented by Hassink and Davidson by focusing on public sector impact on the economy, and by choosing principles that include social/cultural elements like networks and do not focus on equilibrium.

METHODOLOGY

This research explores the potential role of economic development plans in making communities more resilient to natural hazards. My two research questions are: (1) How well do economic development plans currently address economic resilience to natural hazards? and (2) How could economic development plans address economic resilience to hazards in the future?

In order to answer these questions, I evaluated ten economic development plans and interviewed fourteen economic development professionals who contributed to those plans. I evaluated each plan using two types of criteria. The first set of criteria relates to overall plan quality, and is adapted from Philip Berke's 2012 analysis of Hazard Mitigation Plans. The second set of criteria relates to how policies address economic resilience to hazards, and is adapted from the Stockholm Resilience Centre's principles of resilience. In addition to plan evaluation, I also interviewed economic development professionals associated with these plans to identify their perspective on opportunities, barriers, and the value of economic resilience to hazards.

Case Selection

I selected ten plans from a single three-county economic development district in Oregon. The CCD (Coos, Curry and Douglas) Business Development Corporation serves as the economic development district for Coos, Curry and Douglas Counties, which make up much of the southern coast of Oregon. This region has high vulnerability to both natural hazards and economic distress. From a natural hazards perspective, this region experiences chronic flooding, winter storms and wildfires. It is also one of the most vulnerable regions for a catastrophic Cascadia subduction zone earthquake and tsunami. In terms of economic distress, the region has struggled to shift away from natural resource extraction as their primary industries, and continues to be challenged by unemployment and low-wage jobs.

Within this three-county area, I have selected four different types of economic development plans to evaluate: regional, county, city, and port. These plans represent the public sector plans generally present in a region (economic development district, county, city, and port district). By evaluating this range of economic development plans that operate within a region, I am able to clarify issues that are common to economic development plans in general, and issues that are particular to a region or type of plan. Although this study focuses on plans developed by the public sector, private and non-profit organizations may also engage in economic development planning. However, the focus and structure of that planning will depend on the specific mission of the organization. These other organizations typically participate in public sector economic development planning as well.

The ten plans in the study cover the areas shown in Table 1. The regional Comprehensive Economic Development Strategy (CEDS), is supported and approved by the Economic Development Administration, and addresses the entire

three-county economic development district. Each county plan has a unique structure and purpose. The city plans are all economic opportunities analyses, which are regulated by Oregon Department of Land Conservation and Development (DLCD). The port plans are all strategic plans for the port districts, which are generally major economic development drivers in coastal communities.

Table 1. Plan Distribution Across Study Area

Regional	Comprehensive Economic Development Strategy (CEDS)		
County	County 1 Plan	County 2 Plan	County 3 Plan
City	City in County 1	City in County 2	City in County 3
Port	Port in County 1	Port in County 2	Port in County 3

Plan Quality Analysis

In order to establish the capacity of the plan to address issues of resilience, I first looked at plan quality. The specific criteria were adapted from Burke’s evaluation of the quality of coastal state hazard mitigation plans. Burke’s evaluation criteria focus on broad aspects of the plan (described below), and are easily adapted to different types of plans. The six areas of plan quality evaluation are 1) goals, 2) fact base, 3) policies/objectives, 4) implementation and monitoring, 5) coordination with other plans, and 6) public participation. Table 2 describes the basic features of the plan quality criteria, which are discussed in greater detail below. For each particular element discussed below, plans were scored as meeting the criteria, somewhat meeting the criteria, or not meeting the criteria.

Table 2. Plan Quality Criteria

Criteria	Description	References
Goals		
Clear direction	Presence or absence of goals that are unambiguous and focused	Burke et al
Support of Resilience Principles	Presence or absence of goals that relate to Stockholm Resilience Principles	Burke et al
Fact Base		
Geographic Scope	Identification of a precisely defined geographic scope	Burke et al
Identified Hazards	Identification of general or specific natural hazards	Burke et al
Identified Economic Sectors	Presence or absence of broad or specific economic sectors and industries	Burke et al
Identified Legal Frameworks	Presence or absence of broad or specific legal frameworks	Burke et al
Identified Economic Development Organizations	Identification of general or specific economic development organizations	Burke et al
Policies/Objectives		
Actionable	Degree to which policies required interpretation or clarification	Burke et al
Clearly Related to Goals	Whether a policy would potentially or clearly further a goal	Burke et al
Implementation and Monitoring		
Include Implementation Steps	Presence or absence of clear implementation steps	Burke et al
Actions are Assigned	Presence or absence of specific, assigned action items	Burke et al
Includes Means of Monitoring/Tracking	Presence or absence of clear strategies for monitoring and/or tracking implementation	Burke et al
Coordination with Other Plans		
References to Other Economic Development Plans	Identification of types or individual economic development plans	Burke et al
References to Non-economic Development Plans	Identification of types or individual plans other than economic development plans	Burke et al
Public Participation		
Participation from Organizations	Identification of opportunities or specific participation by partner organizations	Burke et al
Public Participation	Identification of general or specific opportunities for public participation	Burke et al

Goals

Goals set broad direction for actions within a plan. I evaluated the goals of each economic development plan on the basis of clear direction, and support of resilience principles (see Table 2). Clear direction refers to how ambiguous or vague a goal is. Goals that are worded like titles, such as “enhance competitiveness” and “economic stimulus” require interpretation and context to understand. Support of resilience principles refers to the extent to which goals addressed the Stockholm Resilience Principles, which provide the foundation for analysis of the policies. Goals might undermine, support, or be neutral towards the principles.

Fact Base

In order to plan for economic resilience, economic development plans must have baseline information regarding known hazards, potential partners in the region, and the economic landscape in terms of business type in the region. I evaluated the fact base of each economic development plan on the basis of five factors (see Table 2). I evaluated each element of the fact base on its presence and level of detail. These elements provide a foundation to address economic and hazard implications through policy.

Policies/Objectives

Plans frequently establish broad goals, which guide policies, which are supported by implementation measures. Not all plans use the same language, however. The element between goals and implementation measures might be referred to as objectives, recommendations, or even action items. I evaluated the content of the policies (or their equivalent) separately for resilience principles.

For the plan quality analysis, I evaluated policies on the basis of being actionable, and relating clearly to goals (see Table 2). Actionable policies contain sufficient detail that implementation measures could be developed without additional clarification or guidance. For example, “expand training opportunities” does not explain what kind of training, or for whom. Relating clearly to goals refers to whether a policy might further a goal if it were implemented.

Implementation and Monitoring

A plan with goals and policies, but no means of implementation has limited opportunities for impact. To be effective, a plan must indicate both how policies will be implemented, and plan for monitoring that implementation. I evaluated goals and policies for implementation and monitoring on the basis of including implementation steps, whether they were assigned to responsible parties, and if plans included means of monitoring or tracking implementation (see Table 2). I evaluated each of the three elements on whether it was present and clear.

Coordination with Other Plans

There is considerable overlap in the goals and impacts of economic development plans, and those of other types of community plans. By coordinating with other

plans, areas of mutual support or potential conflict can be identified, increasing the effectiveness of all plans. I evaluated such coordination based on the presence and specificity of references to both other economic development plans and non-economic development plans (see Table 2).

Public Participation

Public participation improves the quality of a plan by increasing the local perspectives considered and increasing buy-in from the community. Participation can come in the form of inviting representatives from related organizations to contribute, or reaching out to the public in a more open way. Both are valuable to plan quality. I evaluated the public participation of plans on the basis of described opportunities or listed participation from other organizations and the general public (see Table 2).

Resilience Analysis

In order to analyze how these plans address economic resilience to hazards, I adapted and applied the Stockholm Resilience Centre's principles to the specific context of this research. Each plan contained policies or an equivalent element such as actions or recommendations. For the principles below, I evaluated each policy for whether the criteria was absent, present but general (i.e. the policy had the potential to address the principle, but might be carried out without addressing the principle), or clear but not hazard-specific. Table 3 (below) describes the basic elements of the criteria, which are discussed in greater detail below. While several plans included some discussion of natural hazards, no policies specifically addressed hazards. It is important to note that the intention to address hazards is not a requirement for meeting these criteria. Many policies support resilience to natural hazards, whether that was the intention or not.

Support Multiple Types of Businesses and Back-up Resources

Different types of business have different vulnerabilities, and will be impacted by disasters in different ways. Differences that improve resilience of the overall economy include diversity of sector, size, supply chain, location, and markets. It also reduces vulnerability if key resources have back-ups, or redundant sources. I evaluated policies for direct or indirect support of diverse locations, industries/sectors, and markets, as well as support of redundant vital services (see Table 3).

Strengthen Supportive Networks

There are many complex networks that support businesses, and each business or organization will have its own unique network. I analyzed supportive networks by type. Peer-to-peer networks between businesses, and with non-business entities develop channels to share information, resources, and a sense of community. Connections to hazard-specific resources and information can provide targeted assistance. I evaluated policies for direct or indirect creation of opportunities to connect different organizations in support of businesses (see Table 3).

Table 3. Policy Resilience Criteria

Criteria	Description	References
Support Multiple Types of Businesses and Back-up Resources		
Diversity of Business Locations	Presence or absence of a policy that directly supports businesses being sited in diverse locations	Simonsen
Diversity of Business Sectors	Presence or absence of a policy that specifically supports increased diversity of local industry types	Simonsen
Redundancy of Vital Services	Presence or absence of a policy that addresses the creation and/or maintenance of redundant services such as energy, water, or transportation	Simonsen
Diversity of Markets	Presence or absence of a policy that supports businesses having diverse markets for their goods and services	Simonsen
Strengthen Supportive Networks		
Networking Between Businesses	Presence or absence of a policy that creates opportunities for businesses to connect and network with each other	Simonsen
Connections with Emergency Management	Presence or absence of a policy that directly or indirectly creates opportunities to connect with emergency management departments	Simonsen
Vertical Networking to Hazard Resources	Presence or absence of a policy that supports connections with organizations that provide hazard-related resources	Simonsen
Networking Between Businesses and Other Sectors	Presence or absence of a policy that supports networking between local businesses and government or non-profit entities	Simonsen
Identify and Track Areas of Vulnerability		
Monitor Natural Resources for Slow Shifts	Presence or absence of a policy that identifies key natural resources and ways to track shifts in their composition	Simonsen
Preservation of Protective Natural Areas	Presence or absence of a policy that identifies and seeks to preserve natural areas that protect developed areas	Simonsen
Invest in Transportation Networks	Presence or absence of a policy that enhances the ability of transportation networks to withstand or avoid disruption by hazards	Simonsen
Track Legal Changes	Presence or absence of a policy that seeks to track or shift legal frameworks that impact businesses	Simonsen
Track Development in Hazard Zones and Protective Areas	Presence or absence of a policy that monitors development siting for detrimental impacts in areas relevant to hazards	Simonsen
Foster Complex Adaptive Systems Thinking		
Integrate consideration of non-economic systems into economic decisions	Presence or absence of a policy that promotes decision-making that is inclusive of information beyond traditional economics	Simonsen
Work within the carrying capacity of natural systems	Presence or absence of a policy that addresses the sustainability of resource use	Simonsen
Identify opportunities to participate in decision-making that is not explicitly economic in nature	Presence or absence of a policy that supports economic development professionals participating in planning or decision-making groups outside of economic development	Simonsen
Gather and Share Information about Hazards Resilience		
Training on Best Practices Regarding Resilience	Presence or absence of a policy that provides training on practices that support resilience	Simonsen
Partner with Other Organizations for Educational Resources	Presence or absence of a policy that supports partnerships for the purpose of providing educational resources	Simonsen
Develop Plans for Hazards Resilience	Presence or absence of a policy that supports planning efforts which are directly related to hazards or resilience	Simonsen
Share and Build Local Knowledge	Presence or absence of a policy that provides opportunities to develop a nuanced understanding of local conditions	Simonsen
Engage Under-represented Populations		
Outreach to under-served neighborhoods	Presence or absence of a policy that identifies or presents strategies for reaching out to traditionally underserved neighborhoods	Simonsen
Under-represented businesses	Presence or absence of a policy that includes or specially targets under-represented businesses	Simonsen
Engagement for Relationships	Presence or absence of a policy that prioritizes long-term trust-based relationships between businesses and partners through engagement strategies	Simonsen
Share and Clarify Roles and Responsibilities with Partner Organizations		
Key Actors in Preparation and Recovery	Presence or absence of a policy that identifies organizations that would support businesses in preparation and/or recovery	Simonsen
Roles Regarding Hazards	Presence or absence of a policy that proposes meeting with partners to address roles in an emergency situation	Simonsen
Fill Gaps Regarding Hazard Needs	Presence or absence of a policy that proposes strategies for filling gaps around needs such as business continuity or resources for hazards	Simonsen
Coordinate Efforts Between Organizations	Presence or absence of a policy that proposes strategies to enhance coordination between economic development organizations	Simonsen

Identify and Track Areas of Vulnerability

One issue with resilience is that when systems change, they often do so imperceptibly until it is too late to address the change. All of our systems depend on other systems, and when those change in such a way that they no longer meet our needs, we are vulnerable. At the same time, we do not have the resources to track every system that we interact with, so we must choose areas that are of notable importance. For economic resilience to hazards, I focused on natural resources, protective areas (both in regards to preservation and monitored development), transportation and legal systems. I evaluated policies for direct or indirect support for tracking these five types of vulnerability (see Table 3).

Foster Complex Adaptive Systems Thinking

Complex adaptive systems (CAS) thinking is an approach that breaks away from mechanistic, reductionist thinking. CAS thinking considers the relationships between elements to be as important as the function of elements, and accepts change and uncertainty as fundamental. No element or system operates in isolation, and decisions that are made in isolation will inevitably fail to account for the implications of those connections. The Stockholm Resilience Centre considers this way of thinking to be an essential element of resilience, and acknowledges that it can be difficult to foster, due to habit and power dynamics associated with embedded perspectives. Other resilience principles contain elements of systems thinking, but this principle focuses on the value of the perspective as a whole, beyond specific actions to network and monitor change.

With respect to economic resilience to hazards, CAS thinking implies that plans and practitioners should embrace a broader view of systems that impact the economy and that the economy impacts. I evaluated plans on whether they incorporated information outside of economic development into decision making, considered the carrying capacity of natural systems, or encouraged participation in planning for other fields (see Table 3). Because this principle is based in how people think, the interviews revealed more than the plans about how systems thinking is or is not integrated into economic development in this region.

Gather and Share Information about Hazards Resilience

Learning contributes to resilience when relevant knowledge is developed, gathered, and shared with the community. For the purpose of increasing economic resilience to hazards, relevant information includes strategies from other communities; best practices regarding preparation, mitigation, response and recovery; and local knowledge of vulnerabilities and opportunities. I evaluated policies on potential or specific strategies towards four areas of resilience information (see Table 3). Information can be provided locally, through partnerships, or developed through community knowledge. The focus of information sharing can be to educate the business community and partners or to create plans regarding how hazards will be proactively and reactively addressed locally.

Engage Under-represented Populations

Participation that is representative of the community enhances resilience by both increasing the knowledge base and strengthening networks within the community. Economic development actions can increase hazards resilience by actively seeking engagement with under-represented populations that may otherwise lack access to resources. Such populations will also have a unique perspective that will inform community actions. By engaging a wider range of stakeholders, more of the community can increase their resilience, which increases the resilience of the whole. I evaluated policies on identification and outreach to under-served neighborhoods and under-represented businesses, as well as design of engagement to foster relationships (see Table 3).

Share and Clarify Roles and Responsibilities with Partner Organizations

One aspect of a resilient system is that authority and capacity for action is not limited to a single element. What the Stockholm Resilience Centre refers to as “polycentric governance” can be thought of as having multiple organizations able to take both independent and coordinated action. Economic development as a field is extremely dispersed, with many organizations playing a role. Resilience in this aspect is then an issue of coordination, so the actions taken are better informed and have greater impact. I evaluated policies on four factors (see Table 3). For each factor I looked at whether a proposed course of action would accommodate consideration of hazards, or whether hazards were clearly related to the action.

Interviews

Because economic development plans are updated periodically, and respond to local trends and needs, I supplemented plan analysis with interviews from economic development professionals who contributed to the plans. Each plan included a list of contributors, for whom I was able to find email addresses through the plans themselves and organizational websites. Forty-seven people were contacted for interviews, and 14 agreed to be interviewed, for a 30% response rate. Interviewees included professionals from all three counties and each type of plan (CEDS, county, city and port). I interviewed:

- Two city staff
- One local elected official
- One county staff
- Three county elected officials
- Four staff of non-profit organizations
- One port manager
- One business owner
- One representative of a financial institution

While this included all major sectors, various levels of government had the most representation with 50% of the interviews, followed by non-profit organizations

with 29%. Of the ten individual plans, three were not represented in interviews. Two plans were represented by a single interviewee, while three plans were represented by two interviewees. The final two plans were represented by three and four interviewees, respectively, though one interviewee had been involved in both plans, and so was counted twice.

Initial contact was established via email. Interviews were conducted over the phone or in person, depending on the interviewee's preference and availability. Interview times ranged from twenty minutes to an hour, depending on the level of detail provided.

Interview questions (see Appendix A) focused on the perceptions of interviewees regarding the role of economic development plans in hazard resilience, and opportunities and barriers to addressing those issues more robustly in future economic development plans.

Analysis

The analysis of both interviews and plans was qualitative. I aggregated the findings to identify patterns. Once each individual plan had been evaluated for specific criteria, I compared the plan quality assessments by identifying areas that tended to be consistent among the plans or clustered by plan type. I also identified plans that stood out in areas as either particularly strong or weak. For the resilience principles in policies, I aggregated both the number of total policies for each principle, and the number of specific policies for each principle.

Interviews revealed themes both within and across questions. Common answers and attitudes emerged, as well as a spectrum of perspectives. Due to the small number of interviews, I did not identify geographic patterns from the interviews to protect the confidentiality of the interviewees. The themes from both plan analysis and interviews contributed to the synthesis and implications of the findings.

FINDINGS

Within the economic development district, I evaluated ten plans and interviewed fourteen economic development professionals. In the following sections, I review the results of the plan analysis in terms of both plan quality and resilience principles. I also examine common themes that emerged from interviews and conclude with observations from a comparison of plan and interview data.

Plans

Although all of the plans focused on economic development, they were distinct in terms of specific mission, jurisdiction, and available resources. These differences resulted in different structures and adherence to plan quality principles, and varying degrees of alignment with resilience concepts. I evaluated each plan using two distinct sets of criteria - plan quality and resilience. Plan quality looks at broad elements of each plan as a baseline for its effectiveness. Resilience evaluation identifies how policies supported resilience principles, regardless of the intent of the policy. Each set of criteria is described in depth in the methodology chapter. For some types of plans, there are clear trends in terms of plan focus or policy content. For other elements, the type of plan does not appear to have any bearing.

Overall Plan Quality

The plans varied in overall quality assessment. Two of the ten plans addressed every criterion to some degree. The other plans did well in some areas and lacked in other areas. No plan was of dramatically poor quality, and there were no strong trends between the types of plans regarding overall plan quality. Table 4 summarizes the overall performance of the ten plans (A-J) according to the plan quality principles. A notation of strong indicates a majority of individual criteria were fully met, with no missing elements. Weak denotes missing or somewhat present criteria. Areas marked as mixed included those with both strong and weak criteria and those where the most criteria were only somewhat present.

Table 4. Plan Quality Performance

	A	B	C	D	E	F	G	H	I	J
Goals	Strong	Mixed	Strong	Mixed	Strong	Mixed	Weak	Strong	Strong	Mixed
Fact Base	Strong	Mixed	Mixed	Strong	Mixed	Mixed	Strong	Strong	Weak	Mixed
Policies/Objectives	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Strong	Strong	Strong
Implementation and Monitoring	Strong	Mixed	Weak	Weak	Weak	Mixed	Mixed	Strong	Weak	Strong
Coordination with Other Plans	Strong	Weak	Strong	Strong	Strong	Strong	Strong	Strong	Mixed	Mixed
Public Participation in Plan Development	Strong	Strong	Strong	Strong	Mixed	Weak	Mixed	Strong	Weak	Strong

Goals

With the exception of one, the plans had very strong goals. The one outlier did not have explicit goals beyond the mandate of the plan. Six plans (60%) contained goals that all set clear direction. One plan had goals that were all relatively ambiguous, like “enhance competitiveness” and the other two plans had a mixture of clear and ambiguous goals.

In terms of content, none of the goals contradicted or undermined the resilience principles. Seven of the ten plans had a mixture of neutral and supportive goals. Two plans had entirely supportive goals, and one plan had entirely neutral goals. One example of a goal in clear alignment with the resilience principles was “a viable economy that supports working lands and conserves natural lands and their associated ecosystem services.”

Fact Base

I evaluated five elements of the fact base: geographic scope, hazards, economic sectors, legal frameworks, and economic development organizations. One plan lacked a fact base altogether due to the fact that it was an early draft. Because it contained goals and policies, however, this plan was still evaluated. All other plans clearly identified the geographic scope of their plan.

Of the plans with a fact base, there was tremendous variation in the degree to which hazards were covered. Three plans did not mention hazards at all. Interestingly, all three of those plans included SWOT analyses (Strengths, Weaknesses, Opportunities and Threats). So in spite of thinking specifically about threats, natural hazards were not noted. These SWOT analyses did include threats such as high cost for trucking services, perception of high taxes, poor rail conditions, “brain drain,” fisheries regulations, lack of land base and lack of financial resources. Two plans made relatively complete noting of hazards, noting both specific historic hazard events and recurring events like flooding. The other four plans mentioned hazards generally, and/or noted a particular hazard that was deemed to be a concern.

In terms of identifying economic sectors for the area, the plans were predictably strong. The ports spent less time on this section, and one plan had a much less quantitative approach, but all plans mentioned the range of economic sectors in their area, and many went into great detail. This type of analysis is traditional for economic development plans.

While no plan with a fact base neglected to address relevant legal frameworks, there was a range of how much detail was present. Legal frameworks such as state and local regulations can have major impacts on businesses. Three plans only mentioned legal frameworks generally. Four plans mentioned one or two specific legal frameworks. One plan noted both specific and general frameworks, and another plan noted five specific legal frameworks, providing by far the most depth of the plans on this topic.

Economic development is typically a field with many partner organizations. Two plans did not mention other organizations at all, and one plan only mentioned general types of organizations (e.g. chambers of commerce). The other six plans with fact bases all mentioned specific other economic development organizations. As with the economic sectors, port plans tended to have less mention of such partner organizations.

Policies/Objectives

Each plan had policies or some equivalent section in their plan. In terms of plan quality, the policies were evaluated for being actionable and related to the goals. The resilience aspects of the policies are evaluated in the next section.

Four plans had policies that were all actionable. Only one plan had any policies that were too vague to be actionable (e.g. X jurisdiction “recognizes that the forest products industry is the single most important sector of its present economic structure, and will continue to be such in the future”), and that plan also had policies that were somewhat actionable (e.g. X jurisdiction “recognizes that the remaining significant sectors of its economy are resource related [agriculture, commercial fishing, and mineral industry] and seeks to support these industries in achieving future growth”) and clearly actionable (e.g. X jurisdiction “recognizes that local commercial enterprise and industry should be diversified and seeks to attract new business and industry to the county by providing attractive sites and incentives for relocation”). The other five plans had a mix of somewhat actionable and clearly actionable policies.

Generally, the policies were strongly related to their associated goals. The one plan with vague policies lacked connection to goals, and one other plan did not have goals associated with policies. Of the other eight plans, five had policies that were all clearly related to their goals, and the other three had a mix of clearly and partially related to their goals.

Implementation and Monitoring

Implementation language was inconsistent among the plans. Three plans did not address implementation at all. Four plans had implementation steps for every single policy. Two plans had a mix of implied or vague implementation (e.g. “complete the riverwalk” in a city plan, though many partners would participate in such an effort) and clear implementation (e.g. port commission will set policy, port manager will provide overall management, and consultant will provide financial analysis). The last plan provided clear implementation for some policies, vague or implied implementation for others, and no implementation steps for yet other policies.

In terms of assigning implementation steps, the plans followed generally the same pattern as above. The three plans without implementation obviously did not assign implementation measures. Of the four that developed implementation for every policy, three assigned every action to a responsible party. The other plan implied assignments, but did not specify beyond that. The three plans with a mix of implementation specificity also had a mix of assigning those implementation steps.

Monitoring and tracking tended to have a different pattern. The majority of plans (60%) did not address monitoring at all. The four plans that included monitoring either addressed it for a single issue, or had a section about monitoring in general. It is important to note that simply because monitoring and tracking was not discussed in the plans does not mean that it did not occur.

Coordination with Other Plans

With so many kinds of plans in place for communities, it is useful to know how those plans interact, overlap and potentially conflict with each other. Only one plan did not mention any other plans of any kind. One plan mentioned only other economic development plans, and another plan mentioned only non-economic development plans. All other plans mentioned both economic and non-economic plans. The regional-wide plan stood out as taking a wide survey of other relevant plans of both types. Among the other plans, however, there were no trends regarding which types of plans noted more or fewer.

Public Participation in Plan Development

Including multiple perspectives in a plan can strengthen the content and community support. Of the ten plans, one made no mention of any outside participation. Two others (both city-level plans) mentioned only organizational participation or public participation, and did so in very general terms (e.g. met state requirements for public hearings). The other city-level plan mentioned both, but was not specific regarding organizational participation. All other plans mentioned specific participation from both organizations and the general public.

Overall Support for Resilience to Natural Hazards

I evaluated the policies (or their equivalent) in each plan for their support of the resilience principles modified from those of the Stockholm Resilience Centre. The number of policies in each plan ranged from seven to forty. The majority of policies were unrelated to the resilience principles. Other policies supported multiple principles. While none of the plans had a deliberate focus on increasing resilience to hazards, all of the plans had policies that supported such resilience.

Many of the policies also laid a foundation for more direct hazards resilience. If the economic development agencies choose to address hazards directly in future plans, they have existing policies to build from. Table 5 shows the number of policies from each plan that addressed each resilience principle to any degree in white, and the number of policies that addressed the resilience principles in a clear, specific manner in gray. Individual policies were counted multiple times if they addressed multiple resilience principles.

Table 5. Policies Addressing Resilience

All Policies

	A	B	C	D	E	F	G	H	I	J										
Support Multiple Types of Businesses and Back-up Resources	4	2	8	1	14	4	2	1	4	3	6	3	13	4	6	3	5	2	2	2
Strengthen Supportive Networks	7	6	4	0	26	15	0	0	0	0	0	0	7	7	5	5	0	0	9	6
Identify and Track Areas of Vulnerability	4	2	0	0	22	4	1	1	1	0	2	0	4	0	3	1	13	0	9	7
Foster Complex Adaptive Systems Thinking	1	0	0	0	3	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Gather and Share Information About Hazards Resilience	8	4	2	0	11	8	0	0	2	0	0	0	2	1	2	2	0	0	3	1
Engage Under-Represented Populations	2	0	4	0	7	6	0	0	1	0	1	0	1	1	0	0	0	0	0	0
Share and Clarify Roles and Responsibilities with Partner Organizations	5	0	2	0	16	10	0	0	0	0	0	0	2	1	2	0	0	0	5	0
Total Resilience Policies (includes overlap)	31	14	20	1	99	48	3	2	8	3	9	3	30	14	18	11	18	2	28	16

Total Policies

Specific Policies

Support Multiple Types of Businesses and Back-up Resources

This principle is based on the security provided by diversity and redundancy in a system. More policies supported diversity and redundancy across all of the plans than any other resilience principle. This was the only principle that every single plan addressed though at least one policy. Diversity of businesses can take several forms related to resilience. Two plans did not address diversity of location in any policy. Five plans contained at least one policy that clearly supported diverse business locations. The other three plans contained policies that had the potential to support diverse business locations, but did not do so explicitly. One plan addressed location diversity through a policy to review zoning in the city comprehensive plan for three areas to promote development.

Increasing the diversity of economic sectors is a traditional goal of economic development. Only one plan did not have a policy to address this issue, and two other plans had policies that might support diversity of sectors indirectly. All seven other plans addressed business sector diversity in at least one policy. One policy supported sector diversity by identifying specific complementary industries to encourage locally.

Market diversity had mixed representation. Four plans did not address this issue in any policy. Two plans had policies that indirectly supported market diversity. The other four plans had at least one policy to specifically increase market diversity. For example, one plan explored potential expanded markets for local agricultural products in a policy.

Plans had a similar mix of policies to support for redundancy of vital services. Three plans did not support redundancy of vital services. Four plans included policies that specifically supported redundancy of vital services, and the other three plans had policies that indirectly supported such redundancy. One plan looked at redundant telecommunications service through fiber optic infrastructure.

Strengthen Supportive Networks

This principle is based on managing connections between elements to provide support without being so closely connected that failure in one element leads to failure in connected elements. Although fewer overall policies contributed to supportive networks than diversifying the economy and providing back-up services

or identifying and tracking areas of vulnerability, this principle had the most specific policies by a fair margin. Those specific policies came from half of the plans, and four plans did not address this principle at all. At least one plan of each type did address this principle.

One network type is peer-to-peer networking between businesses. None of the ports or cities had policies addressing this type of networking. Among the other four plans, one contained specific policies for business networking, one contained only general policies, one contained both general and specific policies, and one did not have any policies for business networking. Specific policies included elements like incubator development, councils and boards.

The business community can also be connected to emergency management. Only one plan had policies to support such networking, and those were general policies (e.g. increase shared services and municipal agreements), rather than policies specifically geared towards connecting the business community with emergency management. Such policies support networking across silos and with a variety of jurisdictional agencies, but do not specify emergency management.

Beyond emergency management, there are many organizations that businesses can be connected to that might provide resources in the event of a hazard. Four plans had policies to connect with organizations that would clearly be able to provide hazard-oriented resources, such as the Economic Development Administration (EDA), Business Oregon, and regional government. Two plans had policies that could lead to networking with such organizations, and the final four plans did not address the issue.

Networks between businesses and other types of organizations, regardless of specific resources, can also increase resilience. Five out of the six plans that addressed networking at all had specific policies to help establish networks between private sector and non-private sector organizations, such as community colleges, universities, watershed councils, and various levels of government. The other plan to address the issue had a single policy that could promote such networking, but did not lay it out directly.

Identify and Track Areas of Vulnerability

This principle is based on the concern that systems can shift slowly without being noticed, or rapidly in such a way that it is difficult to return to the previous state. Because systems are interdependent, a shift in one can leave another without vital resources. This category was addressed by the second highest number of total policies in the study. Only one plan did not address this principle at all, although five plans lacked specific policies regarding areas of vulnerability. In terms of trends among the types of plans, all three city plans addressed some area of vulnerability, but only in a general way.

Within this principle, I reviewed ways that policies could support monitoring shifts in natural resources. Only one port plan addressed this specifically through a policy addressing beach erosion that threatened a jetty. Four other plans contained policies that acknowledged dependence on natural resources, such as timberland and fisheries, but did not specifically seek to track changes in those resources.

Another area of vulnerability that I looked for in policies was the preservation of protective areas. Three plans (two of which were port plans focused on jetties) addressed protective areas through policies. Two other plans identified protective areas, but did not specifically address their preservation.

Transportation networks are a major area of vulnerability, particularly for this region. Three plans (of all different types) specifically seek to increase the strength of transportation systems. One plan recommended enhancements to multiple modes of transportation, including public transit, highways, and bicycle/pedestrian paths. Another three plans contained policies that address transportation networks, but don't specifically address their resilience.

Legal frameworks can have tremendous implications for the ability of businesses to withstand disruptions. Two plans note specific legal frameworks to track or influence. Two other plans note legal frameworks that impact businesses in their policies, but don't propose to track or influence them. One plan laid out a policy to "develop public policy" in support of economic development, which could include hazard elements if the plan writers decided to incorporate that into the scope.

Development within known hazard zones is another major vulnerability issue for businesses. Only one plan contained a policy specifically addressing siting, and it was not specific to hazards. This policy provided for zoning that would be compatible with commercial and industrial use. Three other plans had policies that could contribute to safer siting of businesses, but did not address it specifically.

Foster Complex Adaptive Systems Thinking

Complex adaptive systems (CAS) thinking prioritizes understanding of relationships between elements and anticipates that change will require adaptation. This principle was particularly challenging to analyze for two reasons. First of all, plans such as economic development plans are generally structured to reflect the way business people and economic developers think, rather than seeking to modify their thinking. As a result, it was difficult to identify policies that both supported CAS thinking and might conceivably be included in an economic development plan. Secondly, CAS thinking, and any way of thinking, is reflected in the very structure of documents, rather than being enacted directly through policy language.

This principle had the fewest policies supporting it by far. Only three plans contained policies that supported the principle in any capacity, and only one policy did so specifically. Four of the six policies supporting systems thinking, including the one specific policy, came from a single plan. This plan (Plan C in Tables 4, 5 and 6) had a strong sustainability focus, and had a broader reach than virtually any other plan, enabling such systemic recommendations.

Two elements that I looked for, 1) incorporation of non-economic information in economic decision making and 2) sharing economic information with non-economic decision-making bodies, tended to be represented in the same policies. All six policies that supported complex adaptive systems thinking did so through proposals of this type of collaboration. Five policies provided potential support through language such as "Greater collaboration is needed between various levels of government and with private and non-profit partners in order to create more

effective economic development efforts that have a greater impact on the region.” The policy that specifically supported systems thinking focused on partnerships with watershed management, noting that “It is tremendously productive to get government, business, landowners, communities, and researchers all working together to solve common problems using a systems approach.”

The third element of CAS thinking that I looked for, working within the carrying capacity of natural systems, was not supported by any plan. This is unsurprising, given that resource management is generally outside of the scope of economic development.

Gather and Share Information About Hazards Resilience

Given that no policies addressed hazards directly, this principle primarily applied to policies that supported learning networks and opportunities that could be expanded to include hazards information. Even so, relatively few policies addressed this principle across the ten plans. Three plans lack any policies associated with learning networks, and two plans have only general policies.

Regarding training for best practices, only one plan had a specific policy, and two other plans had policies that could include such training, but did not directly call for it. The specific training policy called for “appropriate training opportunities to enable ongoing professional development of its staff.” While this calls for training specifically, the resilience element is clearly at the discretion of whoever implements the policy. More plans contained policies to partner for educational resources. Four plans proposed partnering to provide education specifically, and two more plans had policies with enough scope to include education-focused partnerships.

Specifically planning for hazards resilience can take many forms. One port plan addressed this through a policy for risk management planning, which hazards would easily be included in. The policy focused on financial risk with the mandate to “prepare and implement a written risk reduction policy that requires the presentation of a written financial analysis of proposed business ventures.” Another plan included policies that supported additional planning efforts that might include hazards considerations, but did not specify.

Learning can be even more relevant to a community when it is based on local experiences than outside examples. Two plans included specific policies to bring the local business community together to learn from common experiences. One such policy recommended that the community “celebrate and share information” through newsletters, press releases and local events. Three more plans included policies that have the potential to support such learning experiences. The other five plans did not address the sharing of local knowledge in any policies.

Engage Under-represented Populations

Engagement with under-represented populations can increase hazards resilience by creating a better understanding of the priorities and needs of populations that are frequently more vulnerable to disruption by hazards. Engaging under-represented populations had the second fewest policies both overall and in terms

of specific policies. Four plans (including all port plans) did not address broadening participation at all, and only two plans included specific policies in support of this principle.

Geographically, a plan might try to broaden participation by looking at under-represented neighborhoods. One plan contained a specific policy for reaching out to additional neighborhoods for input. Another plan identified neighborhoods that were not included in outreach, but did not propose outreach strategies. The other eight plans did not address neighborhood outreach.

Demographically, a plan might try to broaden participation by seeking out under-represented businesses and owners. Four plans included policies proposing outreach strategies that might connect with under-represented populations. Only one plan had policies to specifically seek out such businesses and owners by increasing “economic opportunities for disadvantaged and disenfranchised populations and individuals.”

Over time, engagement that focuses on trust and relationships can elicit superior input, leading to more informed planning (Simonsen, 2014). Two plans included specific policies regarding long-term relationships with the business community in terms of outreach. An example of such a recommendation is “Develop policies and incentives to retain and expand existing firms. A typical business retention strategy would begin with a task force that would visit local firms and identify issues.” One additional plan contained several policies about engagement that could support long-term trust, but did not identify specific strategies.

Share and Clarify Roles and Responsibilities with Partner Organizations

Economic development is carried out by a host of different organizations. In order to be effective, they must be able to act in a coordinated fashion and be aware of the independent initiatives of other economic development organizations. While six of the ten plans addressed the roles and responsibilities of partner organizations in some policy, only two plans contained specific policies regarding the coordination of different groups.

Five plans contained general policies that identified organizations that might be able to play a role in business preparation and recovery. One plan noted partnerships very strongly, including several that would clearly play a role in preparation and recovery for businesses. This plan identified specific partners for the majority of its policies, including local, regional, state and federal organizations.

Convening is an important part of coordinating efforts. With the particular aim of coordinating emergency services, one plan had a specific policy. This policy called out “emergency services mutual aid agreements” but did so through the cities, rather than directly connecting economic development organizations to emergency management. Another plan had some policies for convening “local and regional partners” that could support emergency services or hazard preparation, but did not state that as an explicit aim.

A large part of the purpose of coordinating efforts is to identify gaps and address them. The needs of businesses around hazards largely have to do with business continuity. Two plans had general policies that could include support for business continuity. One plan had a specific policy for identifying and meeting business needs around continuity of operations. This policy proposed business crisis teams to “identify businesses that are endangered.” All three plans that addressed this issue were at the regional or county level.

Finally, deliberate coordination of efforts can support economic resilience. Even if the coordination does not explicitly relate to hazards, existing patterns of collaboration will allow the support system of economic development to function more effectively before, during and after disasters. Two plans proposed specific policies around coordination of economic development partners. One such recommendation focused on “continued collaboration and celebration” through regular panel discussions, adding components to existing events to involve new organizations and businesses, and combining events that have low participation. Two other plans included policies that noted coordination opportunities, but did not articulate strategies for achieving them.


Plan Trends

Each plan had a distinct geographic scope and focus. The regional plan looks at broad issues and relies on partnerships to achieve its goals. It also has a longer time horizon than many of the other plans. There was tremendous variation across the county plans. Each has a different structure, purpose, and regulatory weight. The city plans were much more specifically mandated, with requirements from the state regarding structure and content. The focus on land use planning within economic development limited the opportunities to address many of the resilience principles explored in this study. The port plans tended to be much more focused, both geographically and on ocean-related economic activity. The port districts are also more exposed to the potentially devastating natural hazards of a subduction zone earthquake/tsunami event. Despite this exposure, port plans were no more likely to address the impact of natural hazards on the local economy. Table 6 summarizes the overall strength of each plan’s quality and the number of policies that address a resilience principle. Plan quality scores simplify Table 4 by assigning three points for strong criteria, two points for mixed criteria, and one point for weak criteria, and showing a percentage out of a possible 18 points. The total policy points may exceed the number of policies in a given plan because policies were counted separately for each principle they addressed.

Table 6. Plan Summary Table

	A		B		C		D		E		F		G		H		I		J	
Average Strength of Plan Quality	Strong (94%)		Mixed (67%)		Strong (78%)		Strong (78%)		Mixed (72%)		Mixed (67%)		Mixed (72%)		Strong (100%)		Weak (61%)		Strong (83%)	
Total Policy Points of Resilience Support	31	14	20	1	99	48	3	2	8	3	9	3	30	14	18	11	18	2	28	16

 Total Policies

 Specific Policies

One plan (Plan C in Table 6) stood out as having the strongest incorporation of resilience principles. Other features of that plan were a strong role by outside facilitators, a wide scope incorporating economic and sustainability concerns, and an aspirational, non-regulatory framing. Of all the plans reviewed, this plan had one

of the weakest focuses on implementation. This different perspective on economic development planning may have made it easier to include policies and recommendations that supported resilience in less traditional ways.

Interviews

In addition to the plan analysis, I interviewed fourteen economic development professionals. I asked about their involvement in the above plans and their perception of how resilience to hazards might be incorporated into economic development plans. Between the fourteen interviewees, every type of economic development plan (regional, county, city and port) and each county was represented. All but three individual plans were represented. Some individuals had participated in the development of multiple plans from the study, providing a wider perspective. Participants included city and county staff, elected officials, business owners, staff of non-profit economic development agencies, and port staff. While some trends emerged from the interviews, there were also many comments that were directly contradictory and represented opposite viewpoints.

Alignment of Economic Development and Hazards

Interviewees were asked about the alignment of purpose between economic development plans and reducing the vulnerability of businesses to hazards. Four respondents said that there was not a significant alignment between the two. Three interviewees indicated a strong alignment that was reflected in current practice of economic development. The remaining seven respondents suggested that there is theoretical alignment between economic development planning and reducing vulnerability for the local economy, but that it is limited and not an active consideration in this region. Among those who suggested theoretical alignment, there was considerable variation as to how much respondents indicated the two areas should overlap. The spectrum of responses ranged from an expectation of strong overlap and interactions between specialists to a tangential connection where limited consideration of hazards could benefit the strength of the economy.

Importance of Planning for the Impact of Hazards on Businesses

In order for hazards to be considered in economic development planning, it must be considered an important issue. When economic development professionals were asked about its importance, reactions were mixed. Two respondents indicated that planning for the impact of hazards on businesses was a minor consideration. One interviewee indicated that it was an important issue, but only at the individual business level, not at the broader community level. Three other respondents suggested that it is an issue, but other considerations were often of greater importance. The eight remaining interviewees classified planning for the impact of hazards on the business community as very important.

For three of the interviewees, the importance was based on the threat of a Cascadia earthquake and the impact that such an event would have on the local

community. Other respondents focused on the rural nature of the area and its vulnerability to isolation, or the thin margins that businesses typically operate on.

Role of Economic Development Plans

Interviewees were asked if they felt that economic development plans were an appropriate place for the business impacts of hazards to be addressed. No one indicated that it should be the sole or primary location for such considerations, but many respondents said that some element of hazard resilience should be addressed in economic development plans. Elements that were mentioned as appropriate for economic development plans to include were:

- Partnership initiatives with emergency management
- Recruitment concerns around hazard vulnerability
- Hazards as a threat within SWOT analyses
- Infrastructure investment to reduce vulnerability to hazards
- Strategies for accessing business-related capital after disasters

Respondents mentioned non-economic development plans that should have either a primary or shared role in addressing the vulnerability of businesses to hazards. These included emergency management plans, comprehensive plans (particularly around development standards), individual business plans, and regional plans geared towards this specific topic. The difference between types of economic development plans was noted in terms of where hazard considerations might be most appropriate. The CEDS was pointed out by one interviewee as the most fitting place for hazards to be considered because of its longer time-horizon and broad regional view. Economic opportunity analyses at the city level were pointed out as being particularly challenging to incorporate other issues into because of their precise mandate and the lack of resources provided for them.

This question generally pointed out the many ways that economic development might reduce the vulnerability of hazards, and that not every plan is equally well suited to that purpose. Particularly because the type of planning that hazards require – long-term investment in risk reduction – was noted by multiple interviewees as not traditionally being the aim of economic development, and so it is challenging to find areas of overlap. Vulnerability reduction is often thought of as someone else’s problem, with economic development serving a different function altogether.

Role of Economic Development Community

Not all activities of the economic development community are laid out in formal plans. When asked about the role they felt the economic development community should play in addressing the vulnerability of businesses to natural hazards, interviewees mentioned the variety of organizations involved and their many strengths and missions. A common concern was that hazards planning is outside of the expertise of most professionals involved in economic development, which limits the value they can add to resilience efforts. Two respondents indicated that, because of this lack of expertise, economic development professionals should not participate in activities related to hazards.

The most common suggestion for how the economic development community could support hazards resilience for the business community was as an educational resource. Virtually every type of economic development organization can distribute some kind of educational material that is both relevant to their personal mission and supports the resilience of businesses to hazards. Some organizations are better suited to broad educational efforts, such as community colleges and small business development centers. Other organizations might focus on educating political figures, rather than providing information to businesses. Capacity of the organization was brought up by several respondents regarding how likely they might be to incorporate hazards considerations into their work. Larger, more regional organizations were perceived as having more resources for such work.

Another specific role that was mentioned for the economic development community to fill with regards to hazards was to pursue grants and other financial resources in the event of a disaster. In order to seek out such resources, they would need to be identified ahead of time, and the rules and regulations around them understood by the local economic development organization looking to fill that role. Developing relationships with representatives of agencies that offer aid, such as the Economic Development Administration can help when working through the paperwork and bureaucracy of applying for and administering financial assistance.

Barriers

When asked what barriers prevented economic development organizations from addressing the vulnerability of businesses to natural hazards, respondents listed a wide variety of issues. Two interviewees indicated that barriers were irrelevant because vulnerability of businesses to hazards was a non-issue. The most common responses were time/money, and a lack of awareness or prioritization. Many people noted that this type of planning would have to be collaborative, because it relies on the expertise of both hazards planners and economic development specialists. The collaborative nature of the work could make it more complicated and resource-intensive. Awareness and prioritization came up in several different contexts. Some interviewees described the issue as denial, while others simply indicated that it was not a common consideration, but would gain traction if it were brought up. One respondent noted that there are currently no organizations taking a lead role in promoting business resilience to hazards, which may be a needed catalyst for action.

Another barrier that came up in multiple interviews was territorialism and separation of disciplines. Respondents noted that particularly within resource-constrained departments, people tend to focus very narrowly on their mandated tasks, and be resistant to working on initiatives with other disciplines. One comment that came up in several interviews was that when it comes to hazards and disasters, businesses are expected to fend for themselves. This perception was viewed as unrealistic and destructive, but prevalent.

Other barriers that were brought up were a polarization among the public between wanting extreme restrictions in risk areas and no restrictions, historic building patterns, lack of accountability, and the perception of investing in uncertain events as inefficient. The inefficiency barrier was particularly interesting, and the

interviewee expanded to say that businesses are designed to be nimble, operating with little in the way of extra resources held in reserve. This is very different from the mindset of government, which is extremely risk averse and has less interest in being able to shift quickly.

Opportunities

It was more challenging for interviewees to identify opportunities to reduce vulnerability of businesses to hazards. This difficulty highlights the fact that the issue itself is not one that receives much attention currently. One of the most common responses was a tongue in cheek comment that the best opportunity to raise awareness of the impact of hazards on businesses was an actual natural disaster. Although no one actually wants to see a local disaster, it is also true that it is hard to get attention for a hypothetical situation. People would generally rather believe that it won't happen here, and so other issues gain priority because they are more readily perceived.

Several interviewees suggested bringing in outside experts to inform and raise awareness for economic development professionals, the public, and elected officials. There were mixed comments on the usefulness of regulations from the state requiring economic development professionals to address hazards. Some indicated that regulation was the only way to get widespread action, while others felt that regulation was unnecessary and harmful, as it would not recognize the particular needs of different areas. A few respondents suggested that there might be a middle ground of allowing more flexible compliance with state goals without creating entirely new requirements.

Some interviewees suggested that the work of reducing vulnerability of businesses to hazards needed to be accompanied by other incentives to be pursued. Some suggestions were multi-objective projects that address priorities from economic development and other areas like emergency management or transportation, short-term financial incentives and assistance, or some form of recognition or award. A final suggestion was to involve organizations like the American Red Cross and other state agencies concerned with long-term economic prosperity as a way of accessing additional resources, expertise and energy.

Other

Several interviewees had comments about particular areas to pay attention to regarding the vulnerability of businesses to hazards. Politics were noted as playing an important role, both in terms of public support and elected officials ensuring that action is taken. The long-term nature of planning for hazards is challenging politically, because such action will often not see benefits until past an elected official's term of office. One interviewee suggested using examples such as New Orleans to illustrate the importance of a long-term view and the vulnerability that local economies face.

Economic development professionals can bring up issues that businesses might not think of on their own, such as succession planning and backing up documents

outside of the area. These strategies can be useful to businesses in other situations than natural disasters, helping them to be less vulnerable to a variety of threats.

One theme that emerged strongly from the interviews was the notion that systems thinking is an overall weakness of the economic development partners in this study area. In spite of many organizations that seem to partner frequently on projects, each group tends to focus in on their particular mission, and only collaborate in limited ways that directly link back to their specific goals. Organizations tend to perceive themselves in isolation both with regard to how and with whom they might partner, and the other physical and social systems that might inform their work.

Summary of Findings

No plan explicitly set out address the impact of hazards on businesses as a part of its purpose. However, every plan had goals and policies (or the equivalent) that support economic resilience to hazards in some respect. Strength of plan quality did not correlate with extensive resilience considerations. For example, the two strongest plans in terms of quality both addressed resilience issues to a moderate degree in their policies. The plan with the strongest resilience content was one of the weakest plans in terms of implementation. This was the only plan to address every resilience principle with specific policies.

Two thirds of the plans with fact bases mentioned hazards to some degree, but no plan specifically addressed natural hazards in their policies or equivalent. Some policies addressed issues closely related to hazards, such as business continuity and risk management, but did so in a way that hazards did not have to be addressed in the implementation of the policy.

Of the resilience principles, supporting multiple types of businesses and back-up resources was most strongly addressed in the plans. It had the greatest overall number of policies and was the only principle that every plan addressed specifically in at least one policy. Engaging under-represented populations was the weakest principle across the plans, with the fewest overall policies and specific policies.

Attitudes varied tremendously among those who contributed to the plans. Some indicated that business vulnerability to hazards was not an important issue, or was sufficiently addressed by existing policies. Others said that it was a very important issue that did not have enough attention or resources. Still others suggested that it was an issue that merited more thought, but that they had not really considered it before.

Overall, the majority of respondents indicated that there was some role for economic development to play in reducing the vulnerability of businesses to hazards, but that it was neither a primary responsibility, nor consistent across different economic development organizations. Depending on geographic scope, specific focus and available resources, plans varied regarding the type and extent of initiatives that interviewees suggested they might take on. Very few interviewees suggested that economic development should have no role in reducing economic vulnerability to hazards.

IMPLICATIONS

The themes that emerged from the analysis of plans and interviews revolved around 1) the perception and 2) strategies of increasing the resilience of local economies to natural hazards. Economic development is a complex system that involves a wide range of groups, initiatives and plans. Incorporating resilience to hazards into that system has many challenges and opportunities that become clearer when looking across the board at current practices and observations by those in the field.

Perception of Unrelatedness

The majority of people contacted in this study initially perceived economic development and hazards resilience to only be distantly connected. In some ways this reflected the core mission of each discipline, and a limited understanding of the scope of hazards resilience. Economic development is traditionally associated with job creation and supporting industry. The types of initiatives interviewees associated with resilience were generally restricted to response and recovery, without considering the proactive elements of preparation and mitigation. By reframing the issue around protecting investments and the larger impact that economic stability has on the community, more options became apparent.

How the issue of economic resilience to natural hazards is framed has to do with the language used and the value proposition. Different people understand the term resilience in different ways, so my interviews focused on reducing vulnerability to natural hazards. While vulnerability was clearer than resilience, many interviewees requested specific examples of what I meant. Continuity of operations and projects that served as economic development through jobs and infrastructure enhancement were examples that clarified the scope of what resilience included. Ultimately, the presentation of the issue had to be grounded in the local reality and values.

The underlying issue of systems thinking is also evident in this implication. Other areas that are not directly associated with the economy, like housing, transportation, and infrastructure, are understood to be relevant to economic development, and are represented in some plans and even policies. Yet the fact that including hazards considerations related to economic development was met with such resistance suggests that the boundaries of what is “related” become rigid quickly. Systems thinking encourages consideration of related areas as a source of context and mutual benefit. A cultural shift towards systems thinking would, according to the Stockholm principles, enhance the resilience of the economic development system considerably.

Existing Indirect Support

From a resilience principles viewpoint, every economic development plan in the study supported resilience in at least two out of seven areas. Diversity, redundancy,

and facilitating networks were most often represented. This support was frequently indirect and not intentionally focused on vulnerability to hazards, but it created a foundation both for a more resilient local economy and future policies to specifically enhance resilience to hazards. Some principles, such as diversity, already have widespread acceptance as a best practice for economic development. Many initiatives can increase the resilience of the local economy without needing to explicitly address hazards. Depending on local support, enhancing indirect resilience principles may be an easier first step for economic development organizations than the adoption of hazard-specific policies.

One of the most essential sources of indirect support is the development of working relationships. Strong networks both internally within the local economy and externally to supportive organizations and institutions create new opportunities in the short term, and ease challenges in the long term. When a disaster strikes, trust is harder to build because things tend to be chaotic. Economic development organizations can serve as a key connection point between individual businesses and government at all levels, non-profits, and the general public. The stronger those connections are before a disaster event, the more effectively resources can be coordinated and opportunities pursued.

Diverse Opportunities

This study focused on the plans coordinated by the public sector, but there is tremendous variety in the types of players involved in economic development. At the smallest scale, individual businesses can increase their own resilience by applying the principles to their own operations. Private and non-profit organizations that support economic development exist at every scale and with unique missions. Within the public sector, scale and jurisdiction have considerable impact on how a group approaches their work.

One of the major implications of this study is that economic development plans and partners are too varied for universal recommendations to be relevant. Interviews revealed that plans in no way encompass the range of economic development activity taking place in any jurisdiction. Many activities occur that are not referenced in plans, but which support the local economy in important ways. Differences between jurisdictions have a significant role in determining how a plan might support resilience. Local politics, economic activity, available resources and exposure to hazards all vary tremendously. Every organization or plan can support the resilience of the local economy in some way. The specifics will depend on the organization's core mission, community and resources. Resilience strategies should be as connected to those realities as possible.

Build On Existing Priorities and Initiatives

Resource limitations came up repeatedly during the study. Participants frequently noted that adding mandates and programs to existing work could undermine the overall mission of their organizations. Because resilience can be supported in so many ways, incorporating its principles into existing strategies and projects can enhance resilience without strong demands on scarce resources. Another benefit to supplementing existing priorities is stronger community support. If a project or

issue has been identified as a priority, incorporating hazards resilience into the conversation is a way of protecting the investments already being made.

Stressing resilience as an element of projects, rather than the basis of additional commitments, also raises its visibility as an issue. Many of the concerns about resilience are the result of decisions being made in isolation, without considering impacts on connected systems. If a resilience lens is applied to projects as a matter of course, resources can be used more efficiently and effectively, meeting multiple objectives with fewer resources. This type of incorporation can support a culture of resilience, building support for projects that may expand on existing priorities in the future. While the adjustments to projects need not be major to accomplish greater resilience, the shift in thinking is the major challenge. Patterns of behavior are difficult to change, and it takes regular reinforcement to shift a culture, particularly one as dispersed as a local economy.

Use Roles Strategically

Just as different economic development organizations have different strengths and challenges, so do different roles that are involved in economic development and hazards planning. As indicated by the plans and interviews, economic development professionals have unique insights into the priorities of business owners and many of the resources available to them. They also have direct relationships with businesses, which gives them more credibility when suggesting actions or representing the business community. At the same time, economic development professionals are not experts in hazards or their impacts, and should not be expected to develop that expertise. Economic development professionals can connect businesses to information and other resources, but much of the creation of those resources lies with other roles.

Emergency managers have much greater expertise with natural hazards and their impacts, and have access to more detailed information if needed. Emergency managers are vital partners in decreasing the vulnerability of their local economies to hazards. They develop plans and strategies that will directly affect businesses in the event of a disaster, and can be a valuable resource in proactively reducing risk before disasters strike. Emergency managers' expertise does not generally include the needs of businesses, either during development and growth, or strategies to absorb a disruption without failing. In order to make plans that support the private sector appropriately, they need the expertise of economic development professionals.

Planners are a third role that can contribute to economic resilience. Planners tend to be generalists, with awareness of both economic concerns and vulnerabilities of their communities. As such, planners can connect the economic and emergency management professionals, and facilitate communication between the two disciplines. Planners can also connect resilience efforts to initiatives such as local comprehensive plans, public works, transportation, and other departments within the jurisdiction.

Regardless of the professional role, it is important to have a local champion if efforts are to be sustained. Outside expertise may raise issues or provide

information, but the value of investing in resilience will be better received if a trusted member of the community proposes it. Because the work of building resilience is ongoing, a local champion also needs to keep the issue at the forefront of conversations and decisions.

Given the emphasis placed on local action, the role of the state or federal government seems to be one of educator, convener or regulator. Interviews suggested that educational opportunities would be welcome. While the notion of regulation was met with strong positive and negative responses, convening may be a way to initiate conversations without taking control away from local economic development and government partners.

Underlying Tension in Economic Resilience

When discussing the challenges of getting business owners to address vulnerabilities and increase their resilience, several participants brought up an unexpected fundamental value difference between economic development and hazards planning. Hazards planning (and government in general) is inherently risk averse, with a long-term view and a goal of reducing loss of life and property. Individual businesses tend to be more opportunistic and accepting of risk, with a short time horizon and a focus on efficiency. This difference in core values can be a hurdle in gaining support for economic resilience activities, and was not reflected in the literature I reviewed. Economic development organizations tend to lie in the middle of this value spectrum. Depending on the organization and its leadership, it may be more closely aligned with business values or government values. Understanding and addressing this divergence in values would help in finding common ground between people and organizations with different affiliations.

Risk and Reward

The resilience of the local economy is also challenging because the risks and rewards are so dispersed. The local economy as a whole is vitally important to the community, particularly in the wake of a disaster. Government has responsibilities to the community, but does not generally support individual businesses. Non-profit organizations and other groups may serve the business community, but may not view the economic health and resilience of the area to be within their scope. Businesses benefit to a degree by increasing their own resilience, but may find that the reward is not worth the cost in the short term. With all of these partial interests and responsibilities, it is difficult to identify one group with primary responsibility for increasing economic resilience. Any one can make a difference, but the greatest gains in resilience will come from partnerships.

CONCLUSIONS

The resilience of a local economy to natural hazards depends on many factors, at many scales, impacted by many actors. Economic development plans are one way in which the public sector influences the local economy. By evaluating an array of economic development plans in one particular region, patterns emerged regarding how those plans currently address resilience to natural hazards, how the intersection of these ideas is viewed, and opportunities that exist to increase the resilience of the local economy.

Perceptions, Reality, and Opportunities

The majority of economic development professionals contacted indicated that they had not considered the connection between economic development and resilience to natural hazards prior to participating in this study. The two fields are generally supported by different organizations that have little or no regular interaction, different cultures, and different underlying values.

Despite this perception, every plan in the study had elements that supported the resilience of the economy to hazards by enhancing such principles as diversity and connectivity. No plan contained policies or the equivalent that directly addressed hazards as a threat, but the implications of those policies nevertheless enhance the resilience of the business community.

Given the current level of support for hazards resilience in economic development plans for this region, there are many opportunities to build on that foundation. Many plans could support resilience in their local economies without addressing hazards specifically at all, simply by strengthening the policies that enhance overall principles of resilience. There are also many opportunities to address hazards specifically in plans, reducing the vulnerability of the business community through hazard-specific strategies, or multi-hazard initiatives. The details of such plans would vary depending on the needs, priorities, and resources of each jurisdiction. There are also opportunities to enhance the resilience of local economies to natural hazards outside of economic development plans altogether, through organizations and initiatives that operate independently of the public sector. Stronger ties between economic development entities and groups focused on hazards would enhance resilience tremendously.

Recommendations

In order to increase the resilience of local economies to natural hazards, different disciplines can take on different strategies. The following recommendations are focused on economic development professionals, emergency managers, and planners. Each recommendation includes a course of action, short-term benefits and long-term benefits.

Economic Development Professionals

This study focused on the role of economic development plans in increasing economic resilience to natural hazards. As such, most of the recommendations here are geared towards economic development professionals.

Enhancing Resilience Principles in Plans

The seven resilience principles provide solid benchmarks for crafting policies that will increase the resilience of local economies. Table 7 suggests some sample policies adapted from those in current economic development plans to support resilience principles.

Table 7. Sample Resilience Policies

Principle	Sample Policy	Short and Long Term Benefits
Support Multiple Types of Businesses and Back-up Resources		
Diversity of Business Locations	Ensure multiple commercial and industrial districts with appropriate zoning and infrastructure	Short term - Increase options for development, Long term - Distribute exposure to hazards
Diversity of Business Sectors	Provide technical assistance for emerging clusters	Short term - Support new employment, Long term - Protect against sector dependence
Redundancy of Vital Services	Seek grant funding for secondary water source	Short term - Economic activity through construction, Long term - Reduced vulnerability to disruption
Diversity of Markets	Increase food security through expanded opportunities for local processing and sale of agricultural products	Short term - Increased economic activity, Long term - Reduced vulnerability to disruption
Strengthen Supportive Networks		
Networking Between Businesses	Host monthly gatherings for businesses to network and engage with local or visiting experts	Short term - Increased visibility of organization, Long term - Increased capacity of businesses
Connections with Emergency Management	Engage in annual meetings with city staff, including emergency management, to review projects and procedures related to the resilience of the business community	Short term - Promote projects to support businesses, Long term - Reduced vulnerability to disruption
Vertical Networking to Hazard Resources	Support a regional grants manager to identify and pursue funding opportunities through state and federal programs	Short term - Increased access to funding streams, Long term - Established resource for pursuing opportunistic or emergency funds
Networking Between Businesses and Other Sectors	Invite non-profit representatives to speak at periodic business networking events	Short term - Increased awareness of available resources, Long term - Established relationships with local orgs
Identify and Track Areas of Vulnerability		
Monitor Natural Resources for Slow Shifts	Participate in a regular forum with fishers, scientists, environmental groups, and regulators to keep informed of marine conditions	Short term - Improved data for decision making, Long term - Improved relationships with historically adversarial groups
Preservation of Protective Natural Areas	Partner with cities, businesses, and other agencies to provide support and resources to businesses voluntarily moving out of the regulatory floodplain	Short term - Identify additional resources for businesses, Long term - Improved relationships with potentially adversarial groups
Invest in Transportation Networks	Partner with state transportation agency to investigate opportunities for seismically reinforced freight corridors	Short term - Improved road conditions and local investment, Long term - More reliable evacuation routes
Track Development in Hazard Zones and Protective Areas	Partner with city government to identify and direct development to business sites outside of hazard zones	Short term - Gain leverage for more buildable land, Long term - Reduced development in vulnerable areas

Adopting Hazard-specific Strategies

Beyond the resilience principles, there are ways to proactively help businesses be more resilient to natural hazards. Some policies focus on individual businesses, such as providing (or partnering with someone to provide) technical assistance for developing continuity of operations plans. In the short term, this can help

businesses through minor disruptions like power outages. Long term, it prepares businesses for major disruptions like a fire or earthquake. Helping businesses to withstand disruption can be a key element of retention strategies.

Other strategies focus on economic development organizations themselves, such as planning for their role in case of an emergency. In the short term, such planning efforts can reveal new resources and strengthen partnerships. In the long term, it allows economic development organizations to smoothly serve the needs of the business community with minimal lag time.

An excellent resource for more specific strategies is the International Economic Development Council's (IEDC) *Leadership in Times of Crisis: A Toolkit for Economic Recovery and Resiliency*. This document details planning processes, financial and other resources, and strategies for connecting with businesses.

Recommendations for Specific Types of Plans

Because different plans operate at different scales and with varied resources, not all strategies make sense for all plans. At the regional scale, economic development districts (EDDs) are particularly well suited for large scale planning efforts. With access to EDA planning grants, EDDs can more easily find the resources to convene large groups. In the short term, these activities can identify additional projects, foster stronger systems thinking approaches and collaborative partnerships, and create resources for smaller jurisdictions to utilize (minimizing duplication of efforts). In the long term, such planning can reduce initial damage from events and speed recovery.

County-level plans are a particularly useful scale at which to focus on rural economic resilience. Rural populations are themselves often under-represented in economic development plans. Partnerships between urban and rural areas within a county can be mutually beneficial in terms of addressing physical, intellectual and financial resources. In the short term, building bridges between urban and rural constituencies can open doors to stronger resource networks and markets. Long-term benefits include stronger social fabric throughout the area and reduced vulnerability for both urban and rural populations.

City-level plans will vary depending on the regulations that guide them. In Oregon, statutes are quite proscriptive regarding what a city must address in their economic opportunity analysis. In order to incorporate resilience into such plans, cities might draw on a wider array of city staff to consider the implications of economic land inventory from more of a systems thinking perspective. A single meeting with a diverse base might reveal valuable connections. In the short term, this can improve the efficient use of land by serving multiple objectives. In the long term, stronger relationships within city government can generate a culture where multi-objective projects are the norm.

Ports are particularly tied to both marine ecosystems and transportation infrastructure (due to their function as transportation hubs). As such, port plans could support more nuanced conversations about the carrying capacity of those ecosystems with strong credibility based on their economic focus. The vulnerabilities of transportation infrastructure to disruption could be addressed

from a resilience perspective by considering all modes, including local, active transportation, and redundancies in case of disruption. Short-term, such strategies can draw in additional funding streams through partnerships. In the long term, the viability of systems will improve and better serve the wider community.

Actions Outside of Plans

Beyond the work of economic development plans themselves, the relationships connecting economic development to other fields and organizations can dramatically increase resilience. Emergency management is certainly one of these relationships, but connections with elected officials, state and federal agencies, and non-profit organizations are also highly beneficial. In both the short and long term, these types of relationships provide access to new knowledge, resources, perspectives, and smoother collaboration. If relationships are not in place when challenges arise, they are harder to build, and those challenges are harder to meet (IEDC, 2014).

Emergency Managers

Many of the recommendations for economic development suggest that they engage with emergency management. For such engagement to be effective, they have to be met half way.

Opportunities for Collaboration

Emergency management can benefit from incorporating economic perspectives into multiple plans. Strategic plans, emergency operations plans, and natural hazard mitigation plans can better address the needs of the community, which is dependent on a vibrant economy, by having economic developers at the table. If your jurisdiction has recovery plans, the economic element is vital. In the short term, simple conversations can inform strategies for every phase of emergency management. In the long term, relationships built through such engagement can lead to much smoother and more effective interactions in an emergency and during recovery.

Language for Collaboration

Different disciplines have different communication styles, and it is important to adjust language in order to effectively engage. Be prepared to try multiple ways of saying something until each side clearly understands the other. Work to clearly articulate the value proposition for economic development in terms of opportunities for projects to better support economic considerations. The long-term benefits of better resources and responses to business needs may be inadequate to gain participation if they have not already considered hazards planning as a priority.

Independent Considerations

If economic development representatives are unwilling to collaborate, there are still opportunities to consider economic needs regarding emergency plans. Simply

thinking through how businesses will be impacted by a course of action, based on general knowledge during planning and drills may reduce unintended consequences. The results will not be as nuanced as it would if local experts were involved, but the consideration is valuable regardless.

Planners

Planners can serve a useful role as conveners when drawing together distinct disciplines such as economic development and emergency management.

Facilitation Role

Planners are more likely to interact with both economic development professionals and emergency managers, but are not affiliated with either one. Having an outside presence push for collaboration can add weight to a request. In the short term, serving as a facilitator can strengthen a planner's relationship with both disciplines. In the long term, involvement in resilience discussions can position a planner to expand such considerations to other areas of concern. Proposals with support from planning, economic development and emergency management are also likely to have more political weight than a proposal from a single department.

Coordinating with Additional Plans

Economic resilience to natural hazards has implications beyond emergency management and economic development plans. Planners have the opportunity to incorporate such considerations into comprehensive plans, zoning maps, infrastructure and capital improvement plans, and transportation plans to name a few. Because planners are involved in so many aspects of a community, they have a unique ability to further a systems perspective and make connections between fields.

Federal and state requirements dictate many of the specific elements that must be included in such plans, and it can be daunting to add to those requirements. However, the opportunity to add a resilience perspective that makes connections between fields can be as simple as an agenda item to discuss trans-disciplinary considerations, or as robust as additional projects and committees to seek out multi-objective actions. While full comprehensive plan updates are relatively rare, they provide a particularly significant opportunity to consider the community from a systems perspective. Because they generally include elements on many aspects of the community, including hazards and economic development, updates are a useful time to bring in experts from all of those fields to discuss areas of intersection.

Stockholm Resilience Principles

The Stockholm Resilience Principles provided an organizing mechanism for considering how resilience might be applied to economic development plans in this study. The scope of the principles was broad enough to encompass a wide range of characteristics. The act of filtering those principles through the specific context of economic systems faced with natural hazards was useful both in terms of better

understanding the principles and considering issues that might not have emerged had I started with the specific context and worked up.

Operationalizing the principles was an iterative process of considering how the broad principle applied to the specific context. For example, with the Stockholm principle of “maintain diversity and redundancy” I looked to economic development literature to see what kinds of diversity and redundancy were particularly necessary for a local economy to withstand and recover from disruption by a natural hazard. I then simplified the list of needed diversity and redundancy to a few categories that might be addressed in an economic development plan. I repeated this process for each principle.

Based on my research, I feel that the Stockholm principles provide a comprehensive view of resilience characteristics, and could be similarly adapted to other contexts. Other approaches that focus on the needs of individual systems might yield complementary results, but the principle-based evaluation is particularly useful in drawing out unexplored concerns and opportunities.

Suggestions for Future Research

This study took a wide view of economic development plan types across a relatively narrow geographic range. A greater understanding of the opportunities for economic resilience could emerge from research exploring the issue from different perspectives. Some potential research opportunities are identified below.

1. Analysis of a single type of economic development plan across a wider geographic area, such as:
 - a. County level comprehensive plan elements for a state
 - b. Comprehensive economic development strategies (CEDs) for a multi-state area (particularly once the resilience requirement is reflected in plans)
 - c. Port strategic plans from a range of coastal states
2. Analysis of chambers of commerce support for hazards resilience
3. Analysis of the entire economic development ecosystem for a case study community
4. Analysis of state frameworks and regulations that restrict or enable economic resilience planning

Local Next Steps

Economic resilience to natural hazards ties together many areas of expertise. Principles of resilience, economic development priorities, local risk from natural hazards, and available resources are all important when identifying appropriate opportunities for a community. To help address the barrier of needing to understand all of these areas, this study will culminate in summary handouts for professionals in planning, economic development and emergency management. These handouts will provide an overview of the issues involved in economic resilience, and strategies that are specific to their role and area of expertise to help build resilience in their community.

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Interview Questions

1. The purpose of (the plan the interviewee was involved in) was (insert purpose statement). From your perspective, does consideration of potential impacts from natural hazards on the business community align with that purpose? To what extent were natural hazards discussed directly or indirectly (for example considering vulnerable transportation routes) during the development of the plan?
2. In your professional opinion, is increasing the ability of the business community to withstand or recover from hazards an important goal? Why or why not? Should resilience be a consideration when investing in projects?
3. Would you consider an economic development plan to be an appropriate place to address the resilience of the business community to natural hazards? Why? If not, where should economic resilience be addressed?
4. Do you think the economic development community should have a role in promoting hazard resilience? To what extent, and in what ways? If not, who should make hazard-related decisions that impact businesses and how should those decision makers be informed?
5. What, if any, barriers exist for addressing the issue of the hazards resilience of the business community? What are barriers to addressing the issue specifically through economic development plans?
6. What, if any, opportunities exist for addressing the issue of the hazards resilience of the business community? For example, are there other potential benefits to addressing hazards such as job creation through mitigation projects or increased competitiveness for grants?
7. X plan (that interviewee was involved in), addresses issues of (insert 1 or 2 criteria with high marks from plan evaluation) strongly. Do you see opportunities to address hazards as a part of these efforts? If so, how? If not, what are barriers?
8. Is there anything else you would like to share about the connection between economic development and hazards planning?