



PROMISING PRACTICES FOR RURAL ECONOMIC DEVELOPMENT AFTER DISASTERS FOR LAKE COUNTY, CALIFORNIA



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This report adds to the on-ground work of local residents and organizations that has emphasized coordination across all levels of government including local, regional, and state levels. Moreover key recommendations from this work and report is to grow local community organizing capacity to make best use of government resources and maximize access in recovering from disaster. For instance, locally groups make use of the Lake County framework, the 10 sub-county area plans in addition to the general plans. One key priority of this grassroots local capacity is to build the local resource environment and to make these tools available to the public.

INTRODUCTION

What is economic recovery after a disaster? Is it just about the business community and the restoration of the market? Does it mean making survivors and households whole again? It is the reconstruction of a community? Economic development itself can be a variety of things but generally its aim is improving the standard of living of residents in a particular place (Phillips & Pittman, 2015). Consumer markets and city infrastructure are key considerations for businesses to determine whether or not to open in a certain location (Bamford & Bruton, 2016). After a disaster, consumer markets and city infrastructure may be severely impacted (Alba et al., 2015). The three general components of an economy is supply, demand, and the institutions that facilitate the market, which can range from physical infrastructure to legal institutions (Gilliland & McSwiggan, 2008). These aspects of a vital and functioning economy order the sections of this report. These are the key topics of 1) business recovery, 2) household recovery, and 3) the political economy of disaster recovery. This covers the restoration of public infrastructure and community assets, linkages with extra-local aid organizations, and disaster mitigation policy.

The economics of disaster recovery are shaped by the context of different kinds of community economies and types of disasters. For example, rural economies or tourist-based economies are different than urban economies or manufacturing-based economies, requiring

different economic strategies to rebuild and nurture. Similarly, wildfires create different kinds of challenges and opportunities than other types of disasters (e.g., flooding, earthquakes, mudslides). Moreover, different populations have different needs: low-income populations with few financial resources or assets will have different recovery needs than high-income and well-resourced populations (Peacock et al., 1997; Quarantelli et al., 2007). Finally, a region that experiences disasters more frequently influences the course of economic development. A region that expects to experience disasters semi-regularly needs to be able to design its community and economy so that it can withstand the on-going shocks a disaster imposes. Economies with higher degrees of poverty and inequality are more fragile. They experience larger negative impacts from disasters and are less likely to recover to pre-disaster levels, which can trigger a downward spiral of disrepair and consumer demand (Peacock et al., 2015; Smith & Wenger, 2007; Bolin, 2007).

Disaster recovery is complex, particular to a specific locale and event, and can be protracted (FEMA, 2011). As an area rebuilds, economic conditions change dramatically and rapidly (Schwab et al., 1998). Disaster response require careful decision-making when emotions are high and crisis situations may still be occurring (Schwab et al., 1998). Data-based decision-making is not always possible (Albala-Bertrand, 2013). Furthermore, delayed decisions can prevent people and businesses from rebuilding quickly (FEMA, 2011). At the same time, rushed, reaction-based vs proactive decisions can have further catastrophic consequences. For instance, temporary sites for housing and businesses may become permanent even though the sites are environmentally sensitive or cannot be serviced easily by public infrastructure (Alba et al., 2015; Schwab et al., 1998). Another potential pitfall may occur if the level of social stratification in a community is high and a small group of people, who are well connected to powerful economic and political organizations outside of the community, drive the economic and political recovery operations within the community, creating a situation in which political ideology can influence economic decision-making that favors certain groups over others (Flora & Flora, 2019). Conversely,

research indicates if the community has broadly participatory local institutions and no one social group dominates extra-local contacts then development outcomes display high entrepreneurship and prioritizes the common good (*ibid.*). This report is intended to help support these kinds of participatory and democratic disaster recovery processes.

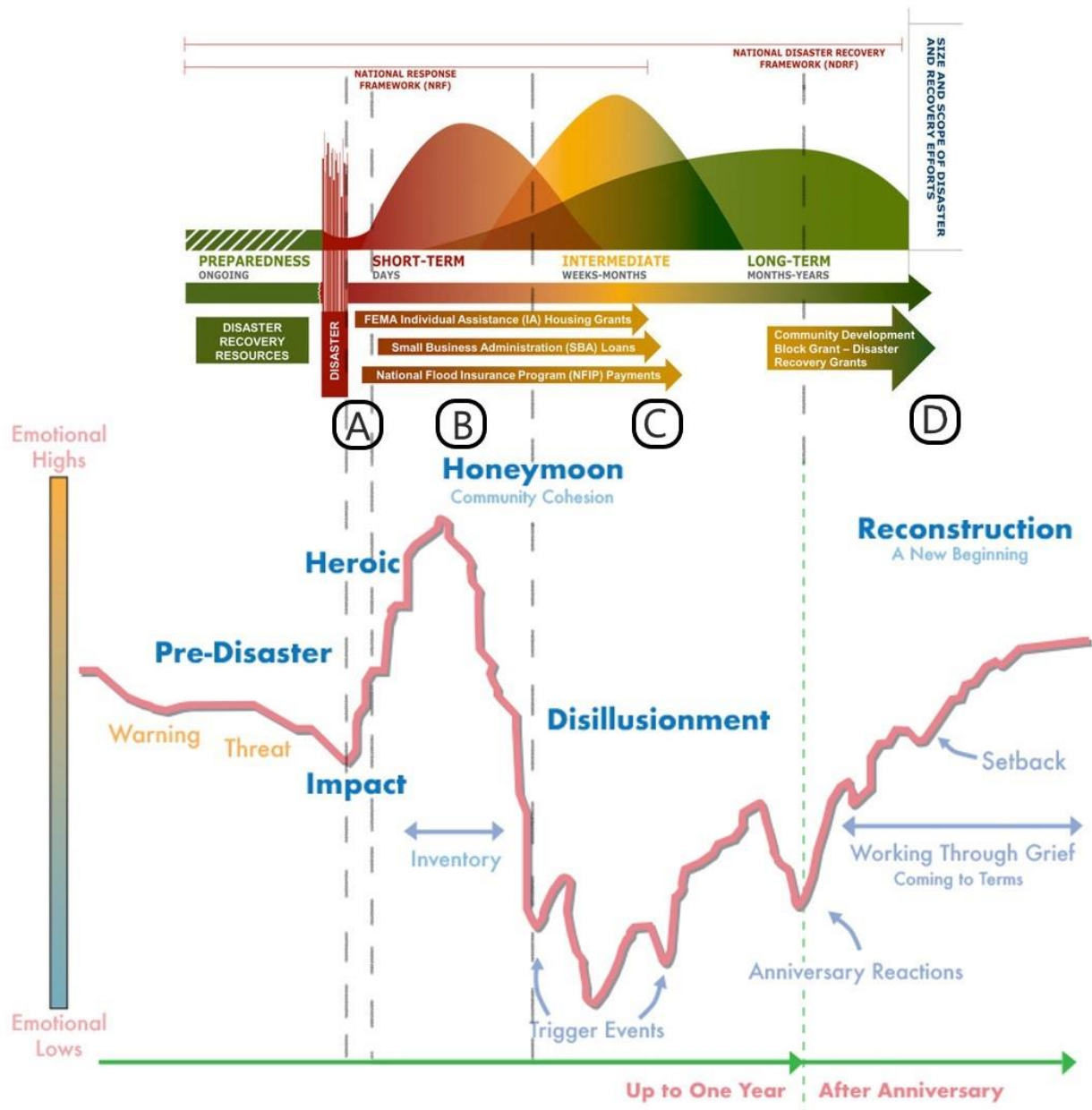
This report includes the following topics and subsections. Each section concludes with a few key recommendations relevant to the Clear Lake Region based on the best available research.

1. Recovery Phases
2. Economic Data and Modeling
3. Business Recovery
 - a. Local Economy
 - b. Business Size Matters
 - c. (Re)Start-up Decisions
4. Household Recovery
 - a. Recovery Disparities
 - b. Rebuild or Move?
5. Public Sphere and Political Economy
 - a. Restoring Public Infrastructure and Community Assets
 - b. Integrated Governance from Local through Federal
 - C. Mitigation Policy

1. RECOVERY PHASES

Disasters are the result of human vulnerability to natural hazards (Tierney, 2019). Natural hazards are physical events like earthquakes, fires, flooding or hurricanes which have the capability of threatening life and infrastructure (Tobin, 1997). Hazards become disasters when human lives and infrastructure are affected (Khan et al., 2008).

Disaster recovery is the period immediately after a disaster when people and organizations attempt to turn towards reestablishing habitability. Recovery can be characterized by four phases: 1) immediate post-disaster relief, 2) short-term rehabilitation and restoration, and 3) intermediate reconstruction, and 4) long-term reconstruction phases (Berke et al., 1993; FEMA, 2011; Khan et al., 2008; Schumann et al., 2020; Smith, 2012). These four phases are diagramed in *Figure 2*, highlighting the psychological component of how these phases are constructed. This is important because economic recovery is more than the restoration of a business environment. The “typical rhythm” of recovery relates to the process of putting a community back together, given the limitations on resources at any specific moment (Smith, 2012, p. 19). The “psychosocial conditions... including the ability of an individual or family to regain a sense of well being” is intimately tied to the achievements of milestones (both positive and negative) in the restoration of housing, businesses, and communities (Smith & Wenger, 2007, p. 238; Smith 2012, p. 20). This is also true for communities. Centering people and their lived, place-based experience as a community during disasters rather than just things and infrastructure orients economic recovery research towards “antifragile” frameworks. Antifragility is a system’s reaction to stress that results in a stronger, more resilient, robust, and adaptable outcome (Taleb, 2014). Transitioning economic recovery research to centering people in an antifragile framework allows communities the capability to not just withstand future disaster but adapt quickly and thrive.



Note: Two diagrams of the post-disaster recovery period overlaid on top of each other. The top graph is the economic recovery periods whilst the bottom graph is the typical emotional reactions that characterize different phases of recovery. A) immediate post-disaster relief, B) short-term rehabilitation and restoration, C) intermediate reconstruction phase, D) long-term reconstruction phase. Graphs from *National Disaster Recovery Framework: Strengthening Disaster Recovery for the Nation* by the Federal Emergency Management Agency, copyright 2011 and *Phases of Disaster* by Substance Abuse and Mental Health Services Administration, copyright 2020.

It is important for stakeholders, regulators, and policymakers to keep in mind that every disaster has a different recovery timespan since each disaster has unique hazard conditions and

human vulnerabilities, and thus unique outcomes (Edgeley & Pavaglio, 2017). The immediate post-disaster period, diagramed as A in *Figure 2* is the first days and weeks when households, businesses, organizations, and local governments are attempting to meet emergency needs such as shelter and medical care, debris removal, search and rescue, or coping with immediate cascading hazards like flooding after wildfires (Berke et al., 1993; Khan et al., 2008; Schumann et al., 2020; Tierney, 2019). The short-term phase, diagramed as B in *Figure 2* is several weeks to months after the initial event when basic services like electricity are restored and an inventory occurs to assess the extent of damage (Khan et al., 2008; Berke et al., 1993; FEMA, 2011). The intermediate phase, phase C in *Figure 2*, is typically several months after the disaster event (and sometimes the first few years in particularly devastating disasters) when critical infrastructure is rebuilt, capital stock replaced, and a community attempts to find a new normal while incorporating mitigation practices for future disaster risks (Khan et al., 2008; 47; Berke et al., 1993; Schumann et al., 2020).

During the long-term phase, phase D in *Figure 2*, the affected community attempts to return to pre-disaster levels of economic growth and development (Berke et al., 1993). During this phase, it is common for residents and businesses to receive insurance payouts; litigation often occurs regarding culpability in triggering the disaster; and municipal departments and agencies get aid from programs like the Community Development Block Grant (FEMA, 2011). Long-term recovery to how things were *before* the disaster is both a distinct phase and an aspirational goal. However, recovery never returns a pre-disaster conditions (Chang and Rose 2012). Rather a “new normal” is produced. Despite its theoretical nature, it is an everyday understanding of what recovery means for survivors (Smith & Wenger 2007; Crow & Albright, 2019). As such, it is held up as the goal a community is working towards as they rebuild (Eid & El-adaway, 2018).

At any time during these phases, there are risks of additional disaster events. When an initial event creates risks that increase disaster vulnerability, subsequent disasters are classified

as cascading or compounding events. A clear causal linkage between two or more disasters makes it a cascading or compounding disaster series. A secondary disaster can happen months and even years later. However, the more time that has passed, the less likely a subsequent event will be considered a cascading event. When two consecutive disasters happen in the same area, but the initial disaster does not make a secondary disaster more likely or increases social or physical vulnerability to disasters, then they are treated as independent events. For example, it is unlikely a hailstorm will interact with a subsequent earthquake.

Consecutive disasters make the classification of recovery periods more complicated. Even in a single event disaster, these phases never happen cleanly one after another (Smith & Wenger 2007, 237). There is overlap as some individuals and organizations can move through recovery faster than others within the same event area (Peacock et al, 2014). Classifying disasters as cascading or compounding is important because of the compounding effects of such events on individuals, communities, and places. Practically speaking, cascading disasters effect economic recovery too. From the perspective of agencies involved in the recovery process, it is easier to treat multiple events as separate events, even within short intervals of time.

2. ECONOMIC DATA AND MODELING

Economic recovery is most often framed as recovery for businesses and the economy alone (Chang & Rose, 2012). However, sustainable and holistic disaster recovery requires the inclusion of additional factors. First, stakeholders from across the community need to be involved in recovery decision-making. Second, there must be an accounting for the three dimensions of vulnerability- social, environmental, as well as economic (Eid & El-adaway, 2018). Inclusion of a broad array of stakeholders ensures economic recovery does not disproportionately benefit (or disadvantage) certain groups over others. Accounting for

differential vulnerabilities due to socio-demographic characteristics makes communities more resilient and antifragile. For example, instituting redundancies and focusing on localism makes a region less dependent on external supply chains when infrastructure is down (Talton, 2020). Nurturing economically independent stakeholders by reducing poverty pre-disaster and building a distributed community wealth promotes financial flexibility during recovery (*ibid*).

Reliable economic data is critical for governments, businesses, and households to make sound financial recovery decisions (Alba et al., 2015). Data collection in the first three phases of recovery (immediate, short-term, intermediate) see *figure 2* has been a priority primarily for insurance companies and government agencies like FEMA to determine assistance needs and insurance industry exposure (Berke et al., 1993; Tierney, 2019). This means most data is private and focuses on direct financial impacts of individual households and business rather than the pro-active process of rebuilding (Chang & Rose, 2012).

Broader economic impacts should also include intangible or indirect losses in addition to tangible and direct losses (Tierney, 2019). This includes business interruption or disruption of supply chains (Hallegatte & Przyluski, 2010). The accuracy of economic models can be limited by the small area or remoteness of a disaster event, the instability of the local economy, available information pre-disaster, and the quality of data obtained during the disaster periods (Albala-Bertrand, 2013). It is also much more difficult to sum indirect, intangible, and non-market impacts (Hallegatte & Przyluski, 2010; Hallegatte & Vogt-Schilb, 2019). For example, in one study on the Po River basin in Italy, the use of different economic models to estimate total economic impact, including indirect losses, resulted in discrepancies up to a factor of seven (Koks et al., 2016). Economic modeling techniques have trouble reflecting how economies work during a disaster scenario, in part because it is difficult to determine what to include or exclude (Albala-Bertrand, 2013; Hallegatte & Przyluski, 2010). Despite these limitations, economic and financial data post-disaster can be used to inform all community stakeholders in the rebuild process.

PROMISING PRACTICES

For Lake County, data driven economic recovery can be promoted by a few key practices:

- 1) An established system of regular, high quality data collection provides pre-disaster baselines to better measure impacts and estimate recovery costs.
- 2) Broaden economic indicators to include as many stakeholders as possible, including households at all socio-economic levels, public organizations and agencies, and community assets.
- 3) Make aggregate financial impact data public, as soon as possible.
- 4) Factor in social and environmental vulnerabilities and not only economic factors.
- 5) Adopt an approach that fosters localism, community wealth, and active participation by citizens in all aspects of economic, social, and public life.
- 6) Create a clearinghouse of information from different planning groups to increase coordination and collaboration across local areas to build up local capacity.

3. BUSINESS RECOVERY

LOCAL ECONOMY

Economic aid can pose unique challenges. The two major types of assistance after disaster are cash aid and in-kind donations, such as clothing. In most cases, cash transfers are preferable because they stimulate local markets (Albala-Bertrand, 2013). Economic recovery is in part the re-establishment of a diverse market of goods and services with enough demand for businesses to make a profit thus sustaining themselves. Survivors of disasters can use cash to purchase the items damaged or destroyed by disaster that they need to replace. In the short term, in-kind donations to survivors helps them move through initial phases of immediate post-disaster relief and short-term rehabilitation and restoration, especially when businesses may still be closed. Flooding the market in the long term with in-kind donations can suffocate local

markets or lead to the “rundown of local [business] viability” (Albala-Bertrand, 2013, p. 148). For example, in-kind donations of clothing can dry up local demand for purchased clothing imperiling clothing businesses attempting to reopen or sustain themselves.

A similar problem occurs when for-profit operations or firms treat a disaster area as a business opportunity and swamp the local market with their larger inventories or more flexible operations. These outside suppliers can outcompete existing local businesses, preventing them from reopening while siphoning cash aid out of the community. Utilizing local businesses for recovery helps keep profits local and channels income into economic multipliers (Diaz, 2012). Reestablishing a healthy balance of different sized businesses allows local economies to access diverse goods and services from outside the community while supporting the families that run local businesses, contributing to community wealth. An unhealthy balance of firm sizes risks a local economy struggling to reestablish viable, sustainable, and profitable businesses and the local economy may fail to reintegrate with the national economy, leaving it distressed (Albala-Bertrand, 2013). For economically struggling communities pre-disaster, disasters can actually spur economic activity by replacing or upgrading infrastructure and capital goods, or providing new market opportunities for local entrepreneurial businesses (Hallegatte, 2019).

BUSINESS SIZE MATTERS

The business community is composed of a diverse set of actors with a mix of international, national, regional, and local businesses. Larger businesses that cross state and national borders are more likely to be corporations and publicly traded (Dobbs et al., 2013). The smaller the territory a business operates at, the more likely it will be classified as a Small Business or a Microbusiness. Small Businesses are classified by the Small Business Administration generally as 1000 employees or fewer (depending on the industry with most ranging from 500 to 1,250 employees) (SBA Table of Small Business Size Standards). Microbusinesses are 4

employees or fewer and compose 92% of US businesses nationally (Goebel et al., 2017). Unless otherwise stated and to streamline this report, *small business* will include microbusinesses.

Disasters impact different business sizes and categories differently. Larger corporations often have significant legal and financial resources available to them. Businesses with a larger operational size and territory correlates with the ability to transfer assets and functions to other locations when disasters impact a regional branch. Big businesses can shuffle resources, depend on revenues from unaffected areas, leverage credit and insurance, and even capitalize on market opportunities. They therefore often have the ability to withstand a financial shock (Alesch et al., 2001; Albala-Bertrand, 2013). Positive factors contributing to business survival is closely related to the strengths of large and/or corporate ventures, including the number of business branches, having numerous employees, and management experience (Watson, 2020).

SMALL BUSINESSES & ENTREPRENEURSHIP

Small businesses on the other hand require adaptability and creative resilience; what is often considered entrepreneurship. Entrepreneurship is a creative process of identifying needs in a community and creating a system to meet those needs (Bamford & Bruton, 2016). Most small businesses are partnerships and sole proprietors. Such small businesses are legally structured such that they are uniquely exposed to financial risk from financial shocks and bankruptcy because they do not have the same access to financial capital as larger corporations. This means they have a lower threshold for which disasters can financially burden them beyond their ability to recover (Gilliland & McSwiggan, 2008; Alba et al., 2015). They must rely heavily on the owner's personality and resilience to setbacks (Bamford & Bruton, 2016; Alesch et al., 2001). Critical decisions during disaster recovery, therefore, can more easily make or break their ability to survive than larger businesses with more assets to cushion mistakes. Larger organizations

usually have specialists that can produce reports on business and economic statistics that smaller businesses usually do not have access to (Alba et al., 2015; Brewer et al., 2013).

Small businesses during normal, non-disaster conditions are under significant pressure to maintain short-term profitability and long-term viability. The Small Business Association states that 50% of small businesses fail within the first five years of operation. Calculating the impact of disasters on small business survival rates can be challenging because a business may not fail immediately (e.g., Tierney, 2007; Chang et al., 2012; Atkinson & Sapat, 2013). A small minority will be unable to reopen after a disaster, but the majority do reopen only to close a few months or a year later. Can the closure of a business a year after a disaster be attributed to the disaster or would it be attributed to normal rates of failure? To answer this question, research suggests that in the majority of cases, small business failures have more to do with pre-disaster viability failures (Alesch et al., 2001). Post-disaster business conditions do have some inherent risk factors for failure. The extent of inventory damage, accessibility issues for supply and demand, the extent of minority ownership or management, extent of customer loss, and issues for employees concerning transportation or disruption of schools (Watson, 2020).

General preparedness for a disaster is not as common in small businesses as publicly traded corporations, which are legally required to publish risk assessments annually but does not necessarily mean these efforts are effective. Small business owners that operate in disaster prone areas like in hurricane zones or have previous disaster experiences do incorporate disaster preparedness to some degree. This includes the purchase of additional insurance or modifying their business model to withstand unexpected closures or interrupted supply chains.

(RE)START-UP DECISIONS

Reopening requires two unique kinds of business skills to cope with a familiar yet volatile market. Entrepreneurial start-up basics are needed to assess how and whether a business should re-open. Start-up basics include whether or not they have the physical ability to be in

business (capital stock, buildings, inventory, utility access), positionality in the market, owner characteristics and resiliency, and demand changes (Alesch, 2001). The ability to leverage established business management and marketing competences will help a business stay open and adapt. Those challenges range from coping with unique financial demands, obstacles to operations, or changing consumer demand. The more financial capital a business has, the more flexibility to adapt. Relatively liquid (quickly accessible) financial capital includes savings, insurance, and credit. However, other capitals like social or political capital are equally critical to navigating market opportunities and access disaster aid at institutional or community levels. Established businesses that are adaptable contributes to resiliency and the ability to return to stable business operations post-disaster.

In the immediate post-disaster time-period, the extent of damages and losses must be assessed. Damages and losses fall into three major categories (Albala-Bertrand, 2013):

1. Operational factors such as capital losses, labor shortages, and whether or not management is available and competent to cope with the disaster. These are closely tied to direct losses from the disaster event.
2. Place-based factors such as whether transportation and utilities infrastructure are functioning. Without roads, for example, to access supply chains and customers to access the business location, or electrical power, then an undamaged business still cannot operate. These are closely tied to indirect losses from interruption of business operations, usually lasting through phase A and B (see *figure 2*).
3. Business environment factors such as the customer base, market condition, structural changes to the community, or changes in the economy. These are intangible losses and occur over a longer period of time, sometimes only temporarily and sometimes permanently.

OPERATIONAL FACTORS

The extent of initial physical damages depends on both the level of exposure to physical hazards and vulnerability to disaster. Large risk exposure to hazards increases the risk of damages but even small hazards can severely impact or ruin a successful business if their vulnerability to them is high. Therefore, the severity of a disaster event is not a good predictor of business failure. The amount of time a business has to prepare for an event (and factor in the intensity and duration of it) can impact the extent of damages. According to some research, disaster preparedness can minimize damages and promote recovery (Alesch et al, 2001).

There are many factors in how severely a business will be affected by disaster other than the physical damage of a disaster event. Assuming damages are surmountable, an owner and its management must carefully compare business resources and risk tolerance for business failure to the post-disaster local conditions. Some business owners have a higher risk tolerance and are willing to reopen even if they are facing uncertain business conditions. Accurate and adequate information can be scarce following a disaster so business leaders must rely on experience and their networks to predict how the business environment will support or challenge recovery. The more resources a business has, the more likely they can withstand risk to such disasters. Such resources may include access to financial capital, a good reputation in the community and loyal consumer base, and political and social capital with the local government, community-based organizations, and other businesses.

The financial strength of a business pre-disaster allows for more flexibility to stay closed without going bankrupt, or make changes to a business location or operations. If a disaster hits during the downside of a business cycle or economic cycle, then businesses will have fewer resources to cope with financial shocks. The severity of damages and length of interruption also makes a difference. Damages from a flood will likely have a shorter impact duration than a multi-year global pandemic. If most of their business operations occurs within a disaster zone, then

their consumer base as well as relationships with local banks or other institutions will also be severely impacted. Disasters may also impact employees making them unable to come to work or may force them to migrate to other less affected areas, itself a resource drain. Drastic measures may need to be taken, including breaking leases to move to another location or completely changing the product lines or services offered (Watson, 2020).

PLACE BASED AND BUSINESS ENVIRONMENT FACTORS

Business owners make informed guesses about the economies and places they are embedded in to determine the viability of their business model. Some of the initial critical decisions owners and managers must make include dealing with an uncertain local economic situation, possible disrepair of public infrastructure, and a volatile consumer market (e.g., Tierney, 2007; Rose & Krausmann, 2013). If there is uncertainty whether the local economy will come back or return to conditions that still make their business viable, then it is difficult to make decisions about reopening and what business model changes are needed. Infrastructure services like electricity or roads for supply deliveries are critical for operation. Depending on the nature of a business's services and products, the consumer market may dry up or alternatively rapidly expand, and may change dramatically even through the disaster recovery period as people have different needs during different stages of rebuilding (e.g., Tierney, 2007).

Consumer demand almost always changes after a disaster, but small businesses can have trouble anticipating or recognizing them. The degree of change in the business environment post-disaster and the amount of experience a business owner or manager has to recognize those changes and adapt can result in a business staying open for many months but operating at a loss. Customers may move away, lose their income, or focus their disposable income on inelastic goods needed for household recovery rather than luxury goods (Albala-Bertrand, 2013). An influx of new people can also change demand trends. Recovery workers like construction crews create a strong but temporary demand opportunity that will eventually disappear (Watson, 2020).

As local goods and services are often unavailable in the short term, if local businesses are unable to recapture the local market or adapt to the new market conditions over the first few months or years, then local economic recovery will falter and national supply chains will replace local ones (Albala-Bertrand, 2013). In the long-term if the local economy remains depressed then low-income populations may move in to take advantage of lower costs of living, further altering demand characteristics and therefore what kind of businesses are likely to be successful (Watson 2020).

While a changing customer base requires creative adaptation of what products and services a business provides, markets may also become more competitive due to the unpredictable post-disaster business environment. When customer loyalty is low and therefore customers are willing to frequent a different establishment or find substitutions, or businesses do not change their marketing strategy to deal with new competitors, then demand may disappear quickly (Alesch et al., 2001). A business owner and its management must be willing to abandon the business-as-usual mind-frame quickly when necessary (Alesch et al., 2001). Disasters fundamentally change the business environment and business disruptions will not eventually settle to the way things used to be. The sooner a business acknowledges this, the more likely they will find a new normal.

PROMISING PRACTICES

For Lake County, there are promising practices for business recovery pre-disaster drawn from community economic development research that include:

1. Fostering entrepreneurship models.
2. Supporting and developing successful minority ownership and management.
3. Promoting disaster preparedness, including adequate disaster insurance.
4. Identifying vulnerabilities in the business community, especially during downcycles in the economy or industry specific business cycles.

5. Alerting businesses on ways to pro-actively respond to changing natural hazards and their risks.
6. Implementing regular local economic data collection and dissemination.
7. Supporting business networking and intra-community business-to-business commerce.

Promising practices for business recovery post-disaster drawn from community economic development research include:

1. Encouraging cash aid over in-kind donations and getting cash transfers to businesses and consumers as soon as possible.
2. Prioritizing local business services for recovery goods and services if they have the capacity to operate safely, and especially if they can scale operations.
3. Providing small business support services and counseling with an emphasis on financial risk and shock management, decision-making and entrepreneurship skills, and marketing. For instance, legal aid can assist with breaking lease contracts or managing risk.
4. Implementing or increasing public transportation services particularly for highly affected areas and for areas historically under resourced.
5. Emphasizing community and public support of the business community.

4. HOUSEHOLD RECOVERY

RECOVERY DISPARITIES

Since much of the built environment in a community is residential, the repair and replacement of housing affects the rebuilding of the rest of the community, including businesses (Moradi & Nejat 2020). Household recovery is understudied in the disaster recovery literature but the speed of household recovery and ability of households to return to their pre-disaster level of standard of living stabilizes local employment, consumption, and the level of participation in public and community activities (Moradi & Nejat, 2020; Smith & Wenger, 2007; Schwab et al.,

1998). Rebuilding residential neighborhoods is not a simple policy or engineering problem. It is fraught with social conflict, and exacerbating, maintaining, or alleviating wealth disparities is a significant part of the rebuild process (Bolin, 2007).

Market allocation of housing is premised on a filtering process that brings up issues of cost and affordability as well as who has access and can afford such housing (i.e., current residents, migrants). Older housing more likely to need repair are also more likely to be inhabited by low-income populations due to rising housing costs across Lake County, California, and the U.S. more broadly (Peacock et al., 1997; Peacock et al., 2015). Housing for different socio-economic demographics is usually spatially distributed in clusters, meaning that entire neighborhoods can become zones of increased vulnerability due to compounded risks due to social and physical vulnerabilities (Van Zandt et al., 2012). Such collocation of physical and social vulnerabilities points to the need for affordable housing in restricted areas and providing distributed site models. Pre-disaster conditions of inequality and by extension vulnerabilities correlate with localized disaster calamities and higher damage within disaster zones. The end result is a “social amplification” of preexisting social, economic, and political disparities (Quarantelli et al., 2007, p. 33). *Figure 3* below illustrates this process wherein the least vulnerable residents recover faster and may end up better off after insurance payouts and other financial aid. The most vulnerable residents, often already worse off, struggle to return to their

pre-disaster standard of living. Disaster impacts are therefore highly uneven. Typically, those with low socio-economic status, and who tend to be people of color, particularly Latinx and Indigenous in Lake County (see Brazil et al., 2021), are the most vulnerable to disasters, experience the highest losses by proportion of assets, and the least likely to get adequate recovery assistance (Peacock et al., 2015; Smith & Wenger, 2007; Bolin, 2007).

Residents' housing needs vary depending on the phase of recovery. Phase A, the immediate post-disaster period, is characterized by the use of temporary shelters, hotel rooms, and staying with friends and family (see *figure 2* above). Phase B, short-term rehabilitation and restoration, moves displaced persons from temporary shelter to temporary housing. This can be a continuation of temporary shelter arrangements but most disaster survivors seek a semi-permanent solution like renting an apartment or utilizing FEMA trailers. Phase C and D, the intermediate and long-term reconstruction phases of disaster recovery, are when homes and multi-unit apartment complexes are rebuilt (FEMA, 2011).

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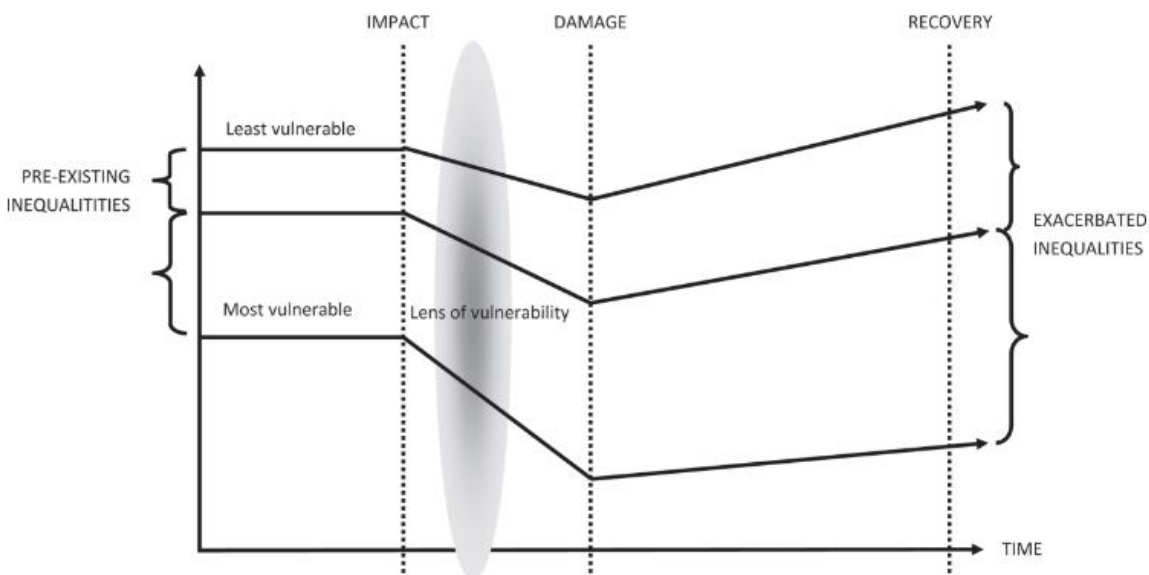


Figure 1. Conceptual model of how housing inequalities may be exacerbated through the recovery process.

Figure 3 shows conceptually how housing inequalities may become refracted through the “lens of vulnerability” (adapted from Peacock et al, 2014).

The process of getting back into permanent housing can be complicated. Strategies for households looking for housing and recovery resources depends on three broad categories: self-sufficiency, kinship relationships, and institutional aid (Bolin & Trainer, 1978). The less impactful the disaster or the more financial resources and assets survivors have, the more likely they will be self-reliant. Although understudied, some research illustrates how self-reliant and well-resourced displaced persons quickly obtain rental units and are among the first to access public and private institutional aid like FEMA assistance and insurance payouts (Peacock et al., 1997). Low-income survivors rely more heavily on family and friends, temporary public shelters, and seek out public aid and charity at higher levels (Peacock et al., 1997). Moving from temporary shelter into long-term housing can be difficult for low-income survivors who have few resources to rent hotel rooms or rental apartments in a tight post-disaster rental market. Those reliant on government aid from agencies like FEMA may end up in temporary housing for months or years, struggling to make the jump back into permanent housing (Peacock et al., 1997).

Housing recovery is rarely entirely self-financed (Peacock et al., 2015). For example, while private insurance markets provide the largest portion of recovery aid; other sources of private financing include savings, commercial loans, and the help of friends and family (Peacock et al., 1997). Unfortunately, low-income homeowners find it especially hard to procure homeowners' insurance with adequate coverage pre-disaster due to its expense, which means not only do they have trouble accessing insurance payouts, but they are also less likely to have sufficient savings to cover costs themselves (Peacock et al., 1997; Peacock et al., 2015). They are also often locked out of commercial loans and FEMA-backed loans because both require minimum credit qualifications that low-income potential borrowers do not typically qualify for (Peacock et al., 1997).

Low-income residents disproportionately live in rental housing due to the increased costs of purchasing a home coupled with stagnant wages, which creates additional recovery burdens.

The poor generally pay more for housing (relative to income) without building long-term equity: a key component of providing benefits for future generations (Desmond and Wilmers, 2019). Moreover, less than half of all renters carry renter's insurance meaning nearly 60% of renters will lose not only their shelter, but also most if not all of their belongings if their rental unit is made uninhabitable. Rental units often take much longer to rebuild and are even less likely to be built as low-income affordable housing (Peacock et al., 1997). Altogether, this system makes displacement levels high, recovery resources scarce, and the whole recovery precarious for low-income residents. Public assistance becomes a critical tool for low-income residents to regain their footing, whether to rebuild a house or establish a new permanent rental home (Peacock et al., 1997).

With a lack of adequate public assistance, alternative sources of aid are developed. For instance, charity aid, especially cash donations from outside of the disaster-affected community often are provided shortly after a disaster. To prevent fraud, standard donation management practices funnel cash through foundations and national or international organizations like the Red Cross. Individuals seeking to access this aid can find it challenging because foundations and nonprofits are not able to make survivors whole over time. Instead, they use cash donations primarily for immediate post-disaster emergency assistance like setting up shelters, or for structural recovery such as to rebuild infrastructure. When direct cash aid to displaced persons is available, navigating the bureaucratic system and fighting for aid is hampered by overwhelming paperwork. Legal ID and other documents can be lost in the disaster, forms may ask for exacting details about lost assets, and gatekeeping is set-up to make survivors prove they are disaster victims rather than a part of the pre-disaster homeless population (Peacock et al., 1997). Mutual aid, the voluntary, reciprocal exchange of resources or services for mutual benefit (Katz, 1981), is one important source of support for those displaced and severely impacted by disaster. Mutual aid can take many forms, including cash donations by community members through such digital platforms as Venmo or Paypal and is flexible in its many uses, providing a sense of empowerment

and autonomy for recipients who then can decide where and how to spend the aid (such as on groceries, legal fees, housing, etc.) (e.g., Healey et al., 2018).

The speed of recovery is inequitable for different socio-economic groups. The longer it takes to reestablish permanent housing, the more likely survivors will run out of financial resources to make a full recovery. Delays will hold up other aspects of recovery too. While housing recovery often occurs within two to three years after disaster for disadvantaged populations, lower rates of recovery and higher rates of inequality may persist long after (Peacock et al., 1997; Peacock et al., 2015). And since disadvantaged groups are more likely to have experienced more severe damage from a disaster, given their increased social vulnerability, and subsequently have fewer resources to become whole again, they may never actually recover to their pre-disaster conditions (Smith & Wenger, 2007).

REBUILD OR MOVE?

In the wake of disaster, each household must weigh its resources against the benefits and drawbacks of staying to rebuild their lives or moving away. There are three broad categories that influence this decision, labeled as internal, interactive, and external drivers (Moradi & Nejat, 2020). While there are some tendencies for preference of one over another, most households factor in all three when trying to decide (Jamali, 2019).

Internal drivers concern the household capacity to cope with the disaster. The level of damage and perceptions of future disaster risk are weighed against financial resources, including the availability of continuing employment (Moradi & Nejat, 2020; Jamali, 2019). The affordability and availability of rental properties is also critical for both pre-disaster renters and for homeowners who need a place to live while rebuilding their homes (Moradi & Nejat 2020). Research also suggests that financial concerns are of particular importance to older individuals (Jamali, 2019).

Interactive drivers concern the identity of individuals and households as influenced by other people and places. These drivers include both the perception of whether friends and family, as well as neighbors and social networks in the community or region intend to stay, as well as the level of attachment to them (Nejat et al., 2019). Closely related to these concerns is the sense of identity offered by the neighborhood itself (Moradi & Nejat, 2020). This phenomenon is often referred to as place attachment in the community development literature (e.g., Logan & Molotch, 2007). There are four factors that mediate this place attachment: (1) demographics, (2) psychosocial factors, (3) socioeconomic class, and (4) specific spatial characteristics of the place itself (Jamali, 2019, p. 25). Demographics refers to shared race, ethnicity, religion, values and other factors, while psychosocial factors refer to social perspectives, mental health and wellbeing, and sense of community belonging. Socioeconomic class refers to job status, education, and property ownership; and, spatial categories are the meaning and characteristics of home, neighborhood, or city; distance from disaster; familiarity with area and its dangers; and whether it is a rural or urban area (*ibid.*). The complexity of these mediating factors and what they tend to mean is not well studied and the research literature provides conflicting evidence (e.g., Jamali, 2019; Nejat et al., 2019; Moradi & Nejat, 2020).

External drivers concern the continued existence of the actual place in terms of infrastructure and community assets (Moradi & Nejat, 2020). Infrastructure is characterized by transportation and geographical features such as highways and streets or waterways and terrain. Community assets refers to formal and informal institutions and organizations, buildings and public facilities, public places like schools and hospitals and churches, commercial areas, and public safety and other social services (Moradi & Nejat, 2020). Research suggests people who live in urban areas which have high densities of infrastructure and community assets and therefore tend to place more emphasis on external drivers in their decision to stay (Nejat et al., 2019).

Broader community development and planning issues impact household recovery as well. For instance, spatial dimensions of socioeconomic drivers of disaster recovery may lead to different outcomes for whiter, wealthier neighborhoods versus high poverty areas or areas with high concentrations of racial and ethnic minority residents. In nonminority neighborhoods that are heavily damaged by disaster, speculation can bid up prices as properties sell and resell multiple times in a short period of time (Zhang & Peacock, 2009). Areas with high rates of poverty and or racial and ethnic minority residents are generally at risk of higher levels of long-term damage and since recovery resources are scarcer, without significant public intervention these areas will see slow recoveries and can sink into permanent disrepair further exacerbating economic, social, and racial disparities (Van Zandt et al., 2012). More stringent codes for reconstruction and increased insurance premiums can influence processes like green gentrification – processes of environmental planning that leads to the exclusion and displacement of local residents - which prevents low-income residents from returning (Gould & Lewis, 2016).

The reopening of businesses and rebuilding of homes operate in tandem, as the lack of businesses means households are less likely to stay because there are fewer employment opportunities and retail locations (Xiao & Van Zandt, 2012). Likewise, if households are unable to return or rebuild then local businesses have trouble finding employees and customers alike (Watson et al., 2020). Consumer demand changes after disasters too, as households shift their financial resources to rebuilding their lives rather than using discretionary income on luxury goods (Watson et al., 2020).

PROMISING PRACTICES

For Lake County, housing recovery promising practices pre-disaster drawn from community economic development research include:

- 1) Reducing social, economic, and racial disparities to ensure community-wide resilience and benefit.
- 2) Maintaining housing stock and preventing disadvantaged neighborhoods from slipping into disrepair.
- 3) Emphasizing a reasonable rental vacancy rate to allow access to rental housing
- 4) Ensuring all homes and rentals maintain home/rental insurance by offering affordable policies.

Post-disaster housing promising practices informed by a review of the extant community economic development academic literature include:

- 1) Prioritizing multi-unit housing development to allow for lower cost housing
- 2) Providing direct cash aid to survivors as soon as possible and with as few strings attached.
- 3) Subsidizing low-income neighborhoods and vulnerable populations to make sure they are able to rebuild in time-frames comparable to less vulnerable and more resourced populations.
- 4) Subsidizing renovation and retrofitting to meet building and health codes and mitigate green gentrification pressures, while building more sustainably.

5. PUBLIC SPHERE AND POLITICAL ECONOMY

RESTORING PUBLIC INFRASTRUCTURE AND COMMUNITY ASSETS

As much as household and business recovery are contingent on each other, the physical reconstruction of the rest of the community and restoring its institutions is necessary for a full recovery. The immediate and short-term recovery periods require “lifeline” reconstruction such as utilities, clearing roads, removing debris, and waste management before anything else can start (Peacock et al., 2015). This in turn may require highly impacted and minimally functioning

local government offices to make emergency decisions, determine priorities, and interface with outside organizations and state and federal agencies. Once recovery activities move into the rebuilding phase, restoring public institutions and community assets are the scaffolding that make both housing and business recovery possible. Compounding such difficulties is that residents can view the government as responsible for disasters and other crises due to its inability to protect the vulnerable and impose long-term planning on the short-term focused market (Quarantelli et al., 2007, p. 32). Thus, the responsibility to prevent another disaster is implicit in recovery activities.

To better understand community economic development during the post-disaster recovery period it is necessary to understand pre-existing social power structures. Powerful interest groups, including business interests and wealthy community members, can disproportionately influence post-disaster decision making and capture recovery aid to inequitably impact more vulnerable community members (Berke et al., 1993). Poorer community members tend to have weaker ties with decision-makers and may have difficulty accessing sources of aid for recovery (Berke et al., 1993). Such recovery problems also extend to local philanthropic foundations. Such foundations that have no problem with day-to-day regional needs can flounder when local staffing size and experience is inadequate to deal with large volumes of development aid, as well as the needs of aid recipients, and coping with demands from federal and state agency programs (*ibid.*). Aid may also not match the needs of local affected community members, particularly when managed by outside organizations and programs not in consultation with local ones. These dynamics can be further complicated in rural areas dependent on tourism because residents may have different recovery needs and interests than tourists. For example, research suggests seasonal residents often have insurance coverage for their homes and prefer the aesthetic of the unmanaged forests, so tend to not engage in fire mitigation efforts (Carroll et al., 2011).

PROMISING PRACTICES

For Lake County, promising practices around restoring public infrastructure and community assets drawn from academic research include:

- 1) Household, business, and community infrastructure recovery must be coordinated in order to ensure a full recovery.
- 2) Greater support to local decisionmakers, including county and Tribal governments, are necessary to help repair and rebuild infrastructure during recovery.
- 3) Local community members and leaders should be included as decision-makers during recovery.
- 4) Efforts must be made so that members from the community representing diverse interests are included in post-disaster decision-making to ensure an equitable recovery.

INTEGRATED GOVERNANCE FROM LOCAL TO FEDERAL

Current approaches to economic recovery depend heavily on external resources and organizations to provide assistance such as insurance payouts, charity aid, and government grants and loans. Therefore, effective collaborative governance between local and extra-local organizations is closely tied to the timing and level of resource assistance, as well as accuracy of resource match with local needs (FEMA, 2011). Since collaborative partnerships have been demonstrated to improve the recovery process, assessing a) the sources of external assistance, b) the nature of assistance, and c) local capacity to interface with extra-local aid sources will help inform decision-makers in the quality of timing, volume, and accuracy of developing and delivering aid.

There are several categories of external organizations to the local affected community that can support the development and delivery of aid post-disaster including (Smith, 2011, pp. 11-12):

- government agencies like the Federal Emergency Management Agency (FEMA),
- quasi-governmental and nongovernmental organizations like community development corporations or regional planning organizations,
- foundations and philanthropic relief organizations,
- nonprofits like the Red Cross,
- private sector organizations like banks, developers, and insurance firms,
- spontaneous groups and individuals looking to provide help (i.e., mutual aid)

The more resources a local government has to leverage, the more likely they can fund their community's own recovery (Crow & Albright, 2019). In addition, "extra-local assistance" can fill in financial, technical, and material gaps when local resources are overwhelmed by recovery needs (Edgeley & Paveglio, 2017; Alba et al., 2015). This is especially the case in areas experiencing consecutive disasters where resources are exhausted and agencies become understaffed and underfunded with de-investment over time (Cutter, 2018). Specifically, Lake County, like many other rural areas, has been operating with a 20% staffing shortage of the county government for years (Huchingson & Scott, 2019).

The nature of recovery assistance is typically framed by two characteristics: (1) governance patterns in the US and (2) the level of centralized versus de-centralized programmatic implementation of aid. Governance in the US is "polycentric and multiscalar," meaning there are multiple overlapping jurisdictions of different levels in the hierarchy of local through federal government (Tierney, 2012, pp. 341-342). Over the past few decades, US governance has seen a devolution of authority, control and governing that has been increasingly decentralized, outsourced, sub-contracted, and privatized (Crow & Albright, 2019; Tierney, 2012). "Disaster governance" specifically refers to the dispersal of disaster policies and programs across public and private entities and/or actors (Tierney, 2012). The organization of governance in the U.S. thus creates challenges for coordinating locally hit disaster zones because there can be

multiple sources of aid with different levels of authority all with difference metrics for qualification, timing of allocation, and level of aid. The complexity of these interlocking systems can produce barriers for those attempting to access aid, and may be additional barriers of entry for the most vulnerable community members.

External organizations, including both nonprofit and government agencies, often times can choose to work with local ones or bypass them. External assistance, especially when administered by agents from extra-local organizations, typically employ a “command and control” approach (Rodriguez et al., 2007). Unfortunately, a type of paternalism characterizes these relationships despite research suggesting collaborative approaches with local community groups, nonprofits, and regional organizations produces faster recovery with better outcomes (Tierney, 2012; Smith 2011; Rodriguez et al., 2007). Prescriptive rules for aid qualification is negatively correlated with understanding and working with local needs (Smith, 2012). If outside organizations bypass local ones, then the affected community may risk a client-state of dependency, losing control of recovery decisions made in their interests.

When external assistance encourages local capacity and decision-making, citizens feel recovery processes are being done *in* their interests, not just “for them” (Quarantelli et al., 2007). Working with local institutions, especially ones with both strong national and local presence like trade unions or religious organizations can improve the “distribution of information, goods, cash, and ‘coordinating directives’” (Albala-Bertrand, 2013, p. 148). Including a diversity of stakeholders in decision-making has been shown to bolster programmatic design and capacity to reflect community needs (Berke & Beatley, 1997; Peacock et al., 1997). The stronger intra-community collaboration and the more local participation in local organizations, the more likely extra-local organizations will be able to collaborate effectively and responsively to local needs (Smith, 2012). Strong local participation and intra-community collaboration ensures not only the diversity of voices across a community are involved but includes a “deep knowledge base... trusted

relationships,” and the ability to “mine external resources” (Flora & Flora, 2019; Smith, 2012; Berke et al., 1993).

Building local capacity that leverages external aid is key to a successful recovery after disaster. Though, managing and administering assistance programs can occupy a considerable share of local recovery time and energy (Smith & Wenger, 2007). Local decision-makers and residents within a disaster area must identify funding sources and technical assistance that match recovery needs, all while coping with the day-to-day decisions and administration of recovery tasks (Smith & Wenger, 2007). Although ad hoc provision of technical planning assistance is common (Smith & Wenger, 2007; Smith, 2011), it is easy to miss opportunities for gathering input, accessing resources, and assessing recovery efforts (Smith 2012, p. 17).

Disasters impact areas much larger than the immediate disaster zone itself through ripple effects. The operational practice of agencies like FEMA tend to focus exclusively on the disaster zone but a disaster impacts neighboring communities in ways that can make them a secondary disaster zone when the primary disaster zone is severe enough. Evacuees need to go somewhere, and neighboring communities serve as hosts to survivors in the short-term at hotels, households of friends and family, and at emergency shelter locations for people and animals. These neighboring communities are staging areas for response and recovery crews, and retail markets experience increases in demand for immediate survival needs and replacement goods. Large numbers of civilians in civic and religious organizations participate in organizing support and aid, disturbing normal activities. While these do not necessarily lead to negative outcomes, during severe disasters the sheer scale of dependence on neighboring communities may extend the impacts of the disaster beyond the declared disaster zone, while by definition these secondarily impacted businesses and public organizations are ineligible for disaster aid (Welcome to Benefits.gov).

In the long-term, there can be significant disruptions in the housing and rental markets, interfering with projected community housing and infrastructure planning and possibly creating a localized housing bubble. Schools and healthcare systems can become overburdened with excess demand when children cannot return to their schools and must enroll elsewhere. Roads may not be able to handle additional traffic either when temporary shelters or new housing is built before public infrastructure can catch up. Homeless populations can increase drastically and quickly. If cultural characteristics of surviving displaced people are different from the new host community, then socio-cultural clashes can lead to adverse outcomes. All these dynamics indicate the need for regional disaster planning and state level leadership.

PROMISING PRACTICES

For Lake County, we suggest several promising practices for integrated governance benefits from pre-disaster drawn from extant academic research:

- 1) Inclusive community planning, development, and programs that reflect diverse community needs.
- 2) Broad community participation in local organizations and governance.
- 3) Regional disaster planning.

MITIGATION POLICY

Political momentum to implement effective disaster mitigation measures and other development changes often occurs during a narrow policy window after disasters rather than before they occur (Crow & Albright 2019; Mockrin, 2018). Lack of attention to proactive policies by policy makers regarding disaster risks makes it difficult to counteract unsustainable development practices before disaster happens. This is because the calculations frequently used can make it seem that mitigation practices are more expensive than the cost of a disaster itself

(Basher, 2008). Disasters are more common in areas of unsustainable development, especially in environmentally sensitive or hazardous areas (Smith & Wenger, 2007; Basher, 2008). In communities dominated by a “growth machine,” where developers, politicians, media, and other players have an interest in growing the economy and increasing land prices, government capacities to decrease vulnerabilities are usually weak (Logan & Molotch, 2007). Mitigation planning and sustainable development practices can directly conflict with these growth machine interests, especially when these sustainability practices cut into tax revenues for local governments (Logan & Molotch, 2007; FEMA, 2011). Residents and communities with wealth and resources can also be less motivated to enact preventative measures because they have the resources to keep rebuilding, especially when disaster insurance keeps paying for these practices (Peralta & Scott, 2018; Mockrin et al., 2008).

The multi-level nature of American governance means land use policy, one of the most important tools for disaster mitigation, is primarily a local-level policy tool, which can be overwhelmed by the power of local growth machines. Land-use policies and zoning are critical organizational tools that manage development types and sprawl into hazardous areas such as high wildfire zones and those with high flood risks. Poor land-use and unenforced building codes results in a “lack of attention to mitigating community risks, poverty, inadequate medical care, and substandard housing” which increase vulnerabilities and set the stage for increased impacts from disasters when they do happen (Rodriguez et al., 2008; Basher 937). Public pressure from constituents, inclusivity, and proactive policy makers in pre-disaster planning can reduce vulnerabilities to hazards (Berke et al., 1993; FEMA, 2011).

The push for sustainable development pre-disaster requires planning and coordination at local, regional, state, and federal levels. If one community sets high standards for development and sustainable, inclusive growth but neighboring communities do not then businesses or housing developments can easily locate to places with lower standards (unleashing a process of

spiraling down into lower resource and lower productivity conditions) (Flora & Flora, 2019). Uneven development then becomes stratified by whole communities (or regions) when market forces filter lower-income people and people of color into marginalized socio-economic areas and wealthier and white residents into higher resource areas. Increasingly, there is a socioeconomic stratification of entire towns and cities rather than healthy, relatively mixed income places, which research suggests leads to better outcomes for the entire community (DeFilippis & Fraser, 2020). One primary example of regional stratification in California, with implications for Lake County, is Napa and Sonoma Counties, with significant socioeconomic differences and development goals.

Regional stratification multiplies disaster risks. Low-income people can spend excessive time commuting to work in areas with more jobs which puts extensive pressures on infrastructure such as roads and results in increased environmental pollution from car exhaust. Unbalanced cities budgets from less diverse economies increases disaster vulnerability because communities either have less resources to prepare and mitigate disasters, have higher levels of poverty, or have fewer resources for recovery. Responsibility and costs for addressing vulnerabilities becomes more difficult as the benefits from sustainable and just policies can then accrue to other places. Only by creating an economy that provides a social foundation within the ecological limits can we start to build the tools for effective economic recoveries to disasters.

The immediate post-disaster and short-term recovery period may be characterized by social tension on all sides due to conflicting preferences from community members (Berke et al. 1993; Smith & Wenger, 2007). Disasters can have “both a galvanizing and local capacity-building influence... [while] amplify preexisting social relationships” (Carroll et al., 2011). Broadly participatory land use planning for high-hazard areas and highly vulnerable populations before a disaster event can be invaluable for making decisions that protect against powerful opportunistic interests by elites after disasters (Peacock et al., 2015; Berke et al., 1993; Quarantelli et al., 2007).

Robust, participatory planning pre-disaster facilitates community connections that will then be in place after disasters to advocate meaningful environmental and social regulations, like meeting the needs of poorer residents and replacing affordable housing stock, something that can be slow during disasters recovery (Smith & Wenger, 2007).

Research has found that sufficient political momentum to recover after wildfire only occurred when disaster impacts were infrequent and there is governmental capacity and resources to implement changes (Mockrin et al., 2018). In areas where wildfire was common, instead of dynamic systems of mitigation and resilience, communities settled into an acceptance of cyclical destruction. These same areas were more likely to have diminished local governmental capacity due to resource depletion of human and financial capital (*ibid*). When changes did occur, momentum for these changes built up when media amplified public pressure to react to shocking disaster events. Changes that do occur after disaster are often popular measures that either do not require compliance, are informal, or are minimally invasive (*ibid.*). Examples would be banning outdoor burning (when the area already does not typically do so) or implementing regulations for land use zones.

PROMISING PRACTICES

For Lake County, promising practices around mitigation drawn from academic research include:

- 1) Broad, participatory land-use planning.
- 2) Encouraging media to highlight disaster impacts to generate public pressure on policy-makers.
- 3) Reducing community and social vulnerabilities.
- 4) Planning and coordination on regional and state levels.
- 5) Encourage diversified economies and development practices for all socio-economic demographics.

REPORT SUMMARY

Given the research reviewed here, we recommend an enhanced planning process that integrates multiple jurisdictions (i.e., local, state, federal, and Tribal) and works with local community leaders, business groups, and non-profit organizations, to apply these promising practices to the place-specific challenges and assests of Lake County.

References

“2015-2018 Fire Map.Pdf.” Lake County, 2018.

Alba, Megan, Louise Anderson, Scott Annis, and Emily Brown. “Leadership in Times of Crisis Toolkit: A Toolkit for Economic Recovery and Resiliency.” International Economic Development Council, 2015.

Albala-Bertrand, J.M. *Disasters and the Networked Economy*. Routledge, 2013.

Alesch, Daniel J, James N Holly, Elliott Mittler, and Robert Nagy. “Organizations at Risk: What Happens When Small Businesses and Not-for-Profits Encounter Natural Disasters,” 2001, 116.

Atkinson, C. L., & Sapat, A. K. (2013). Hurricane Wilma and long-term business recovery in disasters: The role of local government procurement and economic development. *Journal of Homeland Security and Emergency Management*, 11(1), 169-192.

Bamford, Charles E., and Garry D. Bruton. *Entrepreneurship: The Art, Science, and Process for Success*. 2nd ed. New York: McGraw Hill, 2016.

Basher, Reid. “Disaster Impacts: Implications and Policy Responses,” 2008, 19.

Berke, Philip, and Timothy Beatley. *After the Hurricane: Linking Recovery to Sustainable Development in the Caribbean*. John Hopkins University Press, 1997.

Berke, Philip R., Jack Kartez, and Dennis Wenger. “Recovery after Disaster: Achieving Sustainable Development, Mitigation and Equity.” *Disasters* 17, no. 2 (1993): 93–109.
<https://doi.org/10.1111/j.1467-7717.1993.tb01137.x>.

Bolin, Bob. “Race, Class, Ethnicity, and Disaster Vulnerability.” In *Handbook of Disaster Research*, 113–29. Springer, 2007.

Bolin, Robert, and Patricia Trainer. “Modes of Family Recovery Following Disaster: A Cross-National Study.” In *Disasters: Theory and Research*, 233–47. Sage Publications, 1978.

Bourque, Linda B., Judith M. Siegel, Megumi Kano, and Michele M. Wood. “Morbidity and Mortality Associated with Disasters.” In *Handbook of Disaster Research*, 97–112. Springer, 2007.

Brewer, Peter C., Ray H. Garrison, and Eric W. Noreen. *Introduction to Managerial Accounting*. 6th ed. New York: McGraw-Hill Irwin, 2013.

Carroll, Matthew S, Travis Paveglio, Pamela J Jakes, and Lorie L Higgins. “Nontribal Community Recovery from Wildfire Five Years Later: The Case of the Rodeo–Chediski Fire,” 2011, 17.

Chang, S. E., & Rose, A. Z. (2012). Towards a Theory of Economic Recovery from Disasters. *International Journal of Mass Emergencies & Disasters*, 30(2).

- Conservation Biology Institute. "California Fire Perimeters (1989-2019)." 2020.
<https://databasin.org/datasets/bf8db57ee6e0420c8ecce3c6395aceeb>.
- Crow, Deserai A., and Elizabeth A. Albright. "Intergovernmental Relationships after Disaster: State and Local Government Learning during Flood Recovery in Colorado." *Journal of Environmental Policy & Planning* 21, no. 3 (May 4, 2019): 257–74.
<https://doi.org/10.1080/1523908X.2019.1623660>.
- Cutter, Susan L. "Compound, Cascading, or Complex Disasters: What's in a Name?" *Environment: Science and Policy for Sustainable Development* 60, no. 6 (November 2, 2018): 16–25.
<https://doi.org/10.1080/00139157.2018.1517518>.
- . "Pool Knowledge to Stem Losses from Disasters," 2015.
- DeFilippis, J., & Fraser, J. (2020). Why Do We Want Mixed-Income Housing and Neighborhoods? *Wohnungsforschung*, 353–368.
<https://doi.org/10.14361/9783839453513-016>
- Desmond, M., & Wilmers, N. (2019). Do the poor pay more for housing? Exploitation, profit, and risk in rental markets. *American Journal of Sociology*, 124(4), 1090-1124.
- Diaz, John M. "Economic Impacts of Wildfire," 2012, 4.
- Dobbs, Richard, Jaana Remes, Sven Smit, James Manyika, Jonathan Woetzel, and Yaw Agyenim-Boateng. "Urban World: The Shifting Global Business Landscape." McKinsey Global Institute, 2013.
- Editors, The. "Only 41 Percent Of Renters Carry Renters Insurance." *Rental Housing Journal* (blog), August 15, 2018. <https://rentalhousingjournal.com/only-41-percent-of-renters-carry-renters-insurance/>.
- Eid, Mohamed S., and Islam H. El-adaway. "Decision-Making Framework for Holistic Sustainable Disaster Recovery: Agent-Based Approach for Decreasing Vulnerabilities of the Associated Communities." *Journal of Infrastructure Systems* 24, no. 3 (September 2018): 04018009.
[https://doi.org/10.1061/\(ASCE\)IS.1943-555X.0000427](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000427).
- Federal Emergency Management Agency. "National Disaster Recovery Framework: Strengthening Disaster Recovery for the Nation," 2011.
- Flora, CB, and Jan Flora. "Social Capital and Community." In *Rural Communities: Legacy and Change*, 5th ed. Boulder, CO: Westview Press, 2016.
- Gilliland, Ed, and Gerald McSwiggan. "Cedar Rapids Economic Recovery Assessment | Restore Your Economy," 2008.
<https://restoreyoureconomy.org/index.php?src=blog&srctype=detail&refno=82&category=Economic%20Recovery%20Assessment>.
- Goebel, Brian. "StartME_PBC_2017_MicrobizCommunities_Pres_092617_Draft_v1.Pdf." 2017.

- Goebel, Jan, Christian Krekel, Tim Tiefenbach, and Nicolas R. Ziebarth. "How Natural Disasters Can Affect Environmental Concerns, Risk Aversion, and Even Politics: Evidence from Fukushima and Three European Countries." *Journal of Population Economics* 28, no. 4 (October 2015): 1137–80. <https://doi.org/10.1007/s00148-015-0558-8>.
- Gould, K. A., & Lewis, T. L. (2016). *Green gentrification: Urban sustainability and the struggle for environmental justice*. Routledge.
- Hallegatte, Stéphane, and Valentin Przyluski. *The Economics of Natural Disasters: Concepts and Methods*. Policy Research Working Papers. The World Bank, 2010. <https://doi.org/10.1596/1813-9450-5507>.
- Hallegatte, Stephane, and Adrien Vogt-Schilb. "Are Losses from Natural Disasters More Than Just Asset Losses?" In *Advances in Spatial and Economic Modeling of Disaster Impacts*, edited by Yasuhide Okuyama and Adam Rose, 15–42. *Advances in Spatial Science*. Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-16237-5_2.
- Healy, S., Borowiak, C., Pavlovskaya, M., & Safri, M. 2018. Commoning and the politics of solidarity: Transformational responses to poverty. *Geoforum*.
- Huchingson, Carol J. "Priorities for Long-Term Recovery.Pdf." Lake County, 2019.
- Huchingson, Carol J., and Tina Scott. "COUNTY OF LAKE: 10 Disasters Overlaying Long-Term Economic Hardship." Government Statement. County of Lake, October 2019.
- Hystad, Perry W., and Peter C. Keller. "Towards a Destination Tourism Disaster Management Framework: Long-Term Lessons from a Forest Fire Disaster." *Tourism Management* 29, no. 1 (February 2008): 151–62. <https://doi.org/10.1016/j.tourman.2007.02.017>.
- Jamali, Mehdi. "A Human-Centric Approach to Classify Post-Disaster Recovery Priorities." Texas Tech University, 2019.
- Kappes, M.S., M. Papathoma-Köhle, and M. Keiler. "Assessing Physical Vulnerability for Multi-Hazards Using an Indicator-Based Methodology." *Applied Geography* 32, no. 2 (March 2012): 577–90. <https://doi.org/10.1016/j.apgeog.2011.07.002>.
- Katz, A.H., 1981. Self-help and mutual aid: An emerging social movement?. *Annual review of sociology*, 7(1), pp.129-155.
- Khan, Himayatullah, Asmatullah Khan, and Laura Vasilescu. "DISASTER MANAGEMENT CYCLE – A THEORETICAL APPROACH." *Management and Marketing- Craiova*, no. 1 (2008): 43–50.
- Koks, Elco E., Lorenzo Carrera, Olaf Jonkeren, Jeroen C. J. H. Aerts, Trond G. Husby, Mark Thissen, Gabriele Standardi, and Jaroslav Mysiak. "Regional Disaster Impact Analysis: Comparing Input–Output and Computablegeneral Equilibrium Models." *Natural Hazards and Earth System Sciences* 16, no. 8 (August 16, 2016): 1911–24. <https://doi.org/10.5194/nhess-16-1911-2016>.
- Lake County, CA GIS Portal. "Lake County Incident Viewer." 2020. GIS.

- Mockrin, Miranda H. "Does Wildfire Open a Policy Window? Local Government and Community Adaptation After Fire in the United States." *Environmental Management*, 2018, 19.
- Moradi, Saeed, and Ali Nejat. "RecovUS: An Agent-Based Model of Post-Disaster Household Recovery." *Journal of Artificial Societies and Social Simulation* 23, no. 4 (2020): 13. <https://doi.org/10.18564/jasss.4445>.
- Nejat, Ali, Saeed Moradi, and Souparno Ghosh. "Anchors of Social Network Awareness Index: A Key to Modeling Postdisaster Housing Recovery." *Journal of Infrastructure Systems* 25, no. 2 (June 2019): 04019004. [https://doi.org/10.1061/\(ASCE\)IS.1943-555X.0000471](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000471).
- Olshansky, Robert B., and Laurie A. Johnson. *Clear As Mud: Planning for the Rebuilding of New Orleans*. 1st ed. Routledge, 2017. <https://doi.org/10.4324/9781351179713>.
- Peacock, Walter Gillis, Nicole Dash, and Yang Zhang. "Sheltering and Housing Recovery Following Disaster." In *Handbook of Disaster Research*, 258–74. Springer, 2007.
- Peacock, Walter Gillis, Betty Hearn Morrow, and Hugh Gladwin. *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*. Psychology Press, 1997.
- Peacock, Walter Gillis, Shannon Van Zandt, Yang Zhang, and Wesley E. Highfield. "Inequities in Long-Term Housing Recovery After Disasters." *Journal of the American Planning Association* 80, no. 4 (2015): 356–71. <https://doi.org/10.1080/01944363.2014.980440>.
- Peduzzi, Pascal. "The Disaster Risk, Global Change, and Sustainability Nexus." *Sustainability* 11, no. 4 (February 13, 2019): 957. <https://doi.org/10.3390/su11040957>.
- Peralta, Abigail, and Jonathan B Scott. "Moving to Flood Plains: The Unintended Consequences of the National Flood Insurance Program on Population Flows," 2018, 42.
- Phillips, Rhonda, and Robert H. Pittman. *An Introduction to Community Development*. 2nd ed. New York: Routledge, 2015.
- Quarantelli, E.L., Patrick Lagadec, and Arjen Boin. "A Heuristic Approach to Future Disasters and Crises: New, Old, and In-Between Types." In *Handbook of Disaster Research*, 16–41. Springer, 2007.
- Rodríguez, Havidán, Enrico L. Quarantelli, and Russell R. Dynes, eds. *Handbook of Disaster Research*. New York: Springer, 2007.
- Rose, A. "Economic Resilience to Natural and Man-Made Disasters: Multidisciplinary Origins and Contextual Dimensions." *Environmental Hazards* 7, no. 4 (2007): 383–98. <https://doi.org/10.1016/j.envhaz.2007.10.001>.
- Rose, A., & Krausmann, E. (2013). An economic framework for the development of a resilience index for business recovery. *International Journal of Disaster Risk Reduction*, 5, 73-83.

- Ruiter, Marleen C. de, Anaïs Couasnon, Marc J. C. van den Homberg, James E. Daniell, Joel C. Gill, and Philip J. Ward. "Why We Can No Longer Ignore Consecutive Disasters." *Earth's Future* 8, no. 3 (2020): e2019EF001425. <https://doi.org/10.1029/2019EF001425>.
- "SBA Table of Size Standards_Effective Aug 19, 2019 Revised." U.S. Small Business Administration, August 19, 2019.
- Schumann, Ronald L., Miranda Mockrin, Alexandra D. Syphard, Joshua Whittaker, Owen Price, Cassandra Johnson Gaither, Christopher T. Emrich, and Van Butsic. "Wildfire Recovery as a 'Hot Moment' for Creating Fire-Adapted Communities." *International Journal of Disaster Risk Reduction* 42 (January 2020): 101354. <https://doi.org/10.1016/j.ijdr.2019.101354>.
- Schwab, James, Kenneth Topping, Charles Eadie, Robert Deyle, and Richard Smith. "Policies for Guiding Planning for Post-Disaster Recovery and Reconstruction." In *Planning for Post-Disaster Recovery and Reconstruction*. 483/484. APA Planning Advisory Service, 1998.
- "Small Business Facts." SBA Office of Advocacy, 2012.
- Smith, Gavin. *Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework*. Fairfax: Public Entity Risk Institute, 2011.
- . *Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework*. Island Press, 2012.
- Smith, Gavin P., and Dennis Wenger. "Sustainable Disaster Recovery: Operationalizing An Existing Agenda." In *Handbook of Disaster Research*, 234–57. Springer, 2007.
- Taleb, Nassim Nicholas. *Antifragile: Things That Gain from Disorder*. New York: Random House, 2014.
- Talton, Remington Tonar and Ellis. "Cities Must Focus On Fostering Antifragility In The Post-Pandemic World." *Forbes*, May 2, 2020. <https://www.forbes.com/sites/ellistalton/2020/05/02/city-leaders-must-focus-on-building-urban-antifragility-in-the-post-pandemic-world/>.
- Tierney, K. J. (2007). Businesses and disasters: Vulnerability, impacts, and recovery. In *Handbook of disaster research* (pp. 275-296). Springer, New York, NY.
- Tierney, Kathleen. "Disaster Governance: Social, Political, and Economic Dimensions." *Annual Review of Environment and Resources* 37, no. 1 (November 21, 2012): 341–63. <https://doi.org/10.1146/annurev-environ-020911-095618>.
- . *Disasters: A Sociological Approach*. Wiley, 2019.
- Tobin, Graham A. *Natural Hazards: Explanation and Integration*. Guilford Press, 1997.
- Van Zandt, Shannon, Walter Gillis Peacock, Dustin W. Henry, Himanshu Grover, Wesley E. Highfield, and Samuel D. Brody. "Mapping Social Vulnerability to Enhance Housing and

Neighborhood Resilience.” *Housing Policy Debate* 22, no. 1 (January 2012): 29–55.
<https://doi.org/10.1080/10511482.2011.624528>.

Welcome to Benefits.gov. Welcome to Benefits.gov | Benefits.gov. (n.d.).
<https://www.benefits.gov/benefit/813>.

Watson, Maria, Yu Xiao, Jennifer Helgeson, and Maria Dillard. “Importance of Households in Business Disaster Recovery.” *Natural Hazards Review* 21, no. 4 (November 2020): 05020008. [https://doi.org/10.1061/\(ASCE\)NH.1527-6996.0000393](https://doi.org/10.1061/(ASCE)NH.1527-6996.0000393).

Xiao, Yu, and Shannon Van Zandt. “Building Community Resiliency: Spatial Links between Household and Business Post-Disaster Return.” *Urban Studies* 49, no. 11 (November 2012): 2523–42. <https://doi.org/10.1177/0042098011428178>.

Zhang, Yang, and Walter Gillis Peacock. “Planning for Housing Recovery? Lessons Learned From Hurricane Andrew.” *Journal of the American Planning Association* 76, no. 1 (December 31, 2009): 5–24. <https://doi.org/10.1080/01944360903294556>.