

**Resilient Community Food Systems: Intersectional analysis across impacts, values, and
organizational capacity**

by

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

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ABSTRACT

This research focuses on the intersection of food systems and resilience and assesses the role that individuals and organizations play in increasing resilience for community food systems. Both natural and human made disasters impact individuals, families, and communities nationwide, and range in impact from loss of life and financial burden to food access constraints and loss of employment (Smith, 2022). There is a need to understand the evolving concerns around ecological shifts, increase in disasters, rural population decline, and supporting our future generations (Fainstein, 2014; Lin & Chang, 2013; Nelson, Zak, Davine, & Pau, 2016). Communities have differing vulnerabilities and level of resilience based on their potential for “sudden shocks (e.g., catastrophic weather events), intermittent shocks (e.g., price volatility), and gradual pressures (e.g., climate change and shifting human diets) (Schipanski, et al., Realizing Resilient Food Systems, 2016). Thus, understanding the adaptive capacity and perceived impact from shocks and pressures is critical to improve resilience (Vermeulen, Campbell, & Ingram, 2012; Schipanski, et al., 2016; Himanen et al., 2016). While disasters and resilience efforts connect to all areas of the community, this dissertation focuses on the potential of increasing resilience from the lens of food systems.

First, we will discuss frameworks for food systems, including a comparison across local, regional and community food systems. We will also review community development frameworks and assess interconnections for understanding resiliency based on the Community Capitals Framework, adaptive capacity, and additional community development strategies for resilience. From this review, a new resilient community food system definition (RCFS) was created and defined as the capacity for a place- and values-based food systems, and the actors within, to be able to withstand shocks and disruptive pressures while maintaining basic

structures, processes and functions of and within the community food system and supply chain, ensuring the ability to produce and access nutritious and culturally acceptable food over time and space, and creating a new normality (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020).

Second, we will investigate individual and organizational capacity for increasing food systems resilience. Research on individual's values as it relates to their community and food system will be discussed. This includes understanding individuals' perceived value of farm and food businesses, shopping patterns, and community participation activities. Individuals show their personal values through behaviours which are impacted by a myriad of contexts as they shop and interact in our communities (Cairns & Johnston, 2018; Milani Marin & Russo, 2016). These relational values impact how where people spend their money, how they get involved in community, and where they spend time (Carolan, 2016; Wilkins, 2005), including their participation in and support for resilient community food systems. In addition to individual community actors, organizational support and capacity development can help increase resilience. We explore the role individual values have within their decision making related to resilience and food systems and how this relates to individuals' response and interaction in a community food system.

Third, we will investigate specific organizations and their role in supporting resilient community food systems. While this research focuses on the specific intervention of Land Grant Universities and Extension (LGU-E), which are within all U.S states, and territories, we have also included additional organizations identified throughout the mixed-methods research. Land-Grant Universities are one of many organizations that may be beneficial in preparedness, respond and recovery through a disaster. LGU-E receive funding through the Morrill Acts of 1862 and

1890 and 1995 (Association of Public and Land Grant Universities, 2019) and in many cases are equipped to work across and within disciplines (Clancy, 2017). A hypothesis from this research is that, due to their tripartite goals of research, outreach, and education, Land-Grant University Extension may be well positioned to support in planning and enhancing resilient community food systems, as well as determining best practices for recovery and response.

These three concepts will be discussed based on both literature review as well as findings from a mixed-methods research study across five place-based communities with unique food systems that were impacted from COVID-19, natural disasters, and climatic events. Each community participated in a phased research approach, including interviews (virtual), focus groups (in-person), and an individual digital survey, approved through IRB¹. The research led to understanding impacts from COVID-19 and natural disasters, identification of individual's values related to community food systems, and organizational usefulness for response to different disasters. Based on the findings, the first chapter will review an overall understanding of the research; the second chapter will reveal impacts from COVID-19 and natural disasters and ways for achieving more resilience in the future; the third chapter will discuss how individual values impact actions related to resilience community food systems; the fourth chapter will reveal potentials for Land Grant University Extension's role in supporting resilient food systems; and the fifth chapter will conclude with contributions to research and the academic field.

The results show that to foster increased resilience for community food systems,

1. All community capitals benefit resilience; however, natural, built, and social capitals were the most frequently discussed as pillars for resilience, including the ability to

¹ Institutional Review Boards and Protection of Human Subjects- study Exempt

respond and recover following a shock. Social capital related to adaptive capacity and the ability for groups or networks to respond and act immediately.

- a. A resilient community food systems framework was developed to assess existing conditions to prepare and respond to disasters. From this assessment, communities can identify implementation steps, and increase their resilience through community capitals and adaptive capacity measures.
2. While individuals may state a powerful desire and interest in supporting local food, individuals still value convenience and affordability over relationships with the local farmer or business owner, and in some cases more than the local product itself. These contradictory values can lead to cognitive dissonance and impact the support of local food systems.
3. Organizational support for facilitation, planning, and disaster response is seen as a major need across communities. LGU-E is not currently seen as an active participant in creating resilience for community food systems. However, LGU-E may be able to strengthen their participation and support for communities in future activities if they focus on building trust with the community and provide necessary and relevant technical assistance.
 - a. The resilient community food systems framework mentioned in 1.a. may be one tool that community organizations can utilize to assess and develop strategies for their future. LGU-E is one potential organization, among many, that could support in this effort.

CHAPTER 1. GENERAL INTRODUCTION

This research focuses on the intersection of community development, resilience, and food systems and the role that Land-Grant University Extension (LGU-E) holds within the space of resilient community food systems. Areas of interest include place-based community development strategies for resilient community food systems; residents' values of resilient community food systems, and LGU-E engagement methods for supporting resilient community food systems. This introduction chapter provides an overview of each concept, the interconnection between each, and the argument of how they can benefit one another.

Community Development

Community development is an underlying framework for understanding resilient community food systems and place-based efforts. Community development frameworks are utilized to help revitalize and enhance communities place-based assets and opportunities. Processes to assist in community development involve facilitation, visioning, and capacity development and tend to focus on resolving complicated systemic issues (Moomaw, 2016) that incorporate social, physical, and economic strategies (Sites, Chaskin, & Parks, 2007). Communities play a vital role both to their own sustainability as well as contributions to national and global sustainability and are comprised of the area and place that individuals typically work, maintain their health and well-being, and bear new generations (DeFillipis & Saegert, 2012). Community can also be viewed as a group of people in a locality that initiate a social action process to change their economic, social, cultural and/or environmental situation (Sharp, Jackson-Smith, & Smith, 2011). Some describe community development as increasing the ability to act collectively with an outcome to take collective action, and as a result, the community will see improvements in areas of focus, which can range from: physical, environmental, cultural,

social, political, economic, etc. (Christensen & Phillips, 2016). Table 1-1 details the nuances between selected theories of community development.

Table 1-1: Methods of Community Development, Audience, and Goal

	For Whom	Goals and Objectives	Strengths	Weaknesses
Community Development	Place-based community members and businesses	Enhance assets, creating competency, developing leadership, promoting partnership and collaboration; Provide for everyday needs of residence; Community intervention in which community members create accountable development; (Sites, Chaskin, & Parks, 2007); focuses on a broad range of development issues	Process based Community intervention Self-directed	Rely on social capital and relationships; Creating meaningful change and having sufficient capacity; Dependence on external resources; (Sites, Chaskin, & Parks, 2007)
Economic Development	Community members and businesses	Mobilizing community-based development to realize local, place based economic development- entrepreneurial inventiveness; Public and Private sector relationships; building community assets; (Sites, Chaskin, & Parks, 2007)	Place-based economic development; community-asset based	Tension between community capacity and development
Community Economic Development	Geographic based area; typically, low-resource individuals and physical spaces (Green Leigh & Blakely, 2017)	Generate socially useful and labor-intensive projects- employment; control over economy; inspiring self-help; public benefit; alternative economic activity; democratic management (Booth & Fortis, 1987); “Efforts to develop housing, jobs, businesses for low-income people, create a leading role for nonprofit and nongovernment agencies” (Green Leigh & Blakely, 2017)	Socially useful projects; Local control and ownership; Systemic approach to development (Christensen & Phillips, 2016)	Labor intensive; Long-term
Local Economic Development	Place-based community members, businesses, and place	Corporate Center Approach: Real estate development and industrial attract- growth and tax base expansion; target growth sectors; Alternative Approach: Stimulate local employment opportunities in sectors that improve the community using existing human, natural, and institutional resources; Increase the number and variety of jobs in an active way; networks and clusters are more critical than individual firms (Blakely & Bradshaw, 2002)	Private Sector- development driven; Private and public sector interventions; direct benefits to low-income; target locally owned	Private and Public Sector not closely aligned; concentration in central districts; emphasis on jobs for white-collar and skilled workers
Neighborhood Economic Development	Neighborhood residents, businesses, and organizations- but understanding of contextual elements and larger regional draw	Business retention- neighborhood organizations; Commercial revitalization- promoting economic growth of commercial districts; Business ventures and entrepreneurship; Capital accumulation; Education and Training; Labor-based development; Community Planning (Wiewel, Teitz, & Giloth, 2012)	Neighborhood based; strategic	Relevant to urban neighborhoods

Community economic development (CED) focuses on methods of thinking regarding benefitting the entire population and targeting locally-owned businesses and organizations, while also promoting relationship development to foster social capital (Phillips, 2016); this may include: ensuring livable wages, developing ecologically sound building practices, building bridging and bonding social capital, and increasing the quality of life for individuals in the community (Christensen & Phillips, 2016; Hughes & Boys, 2015). While CED looks at a large scale for community, neighborhood economic development focuses on a smaller scale and typically urban neighborhood settings.

Local Economic Development (LED) promotes place-based development that builds both capacity and resources for employees and residents (Blakely & Bradshaw, 2002). This process is more hands-on than a typical economic development strategy but still includes many different sectors of the community. According to Blakely & Bradshaw, LED is still evolving, and typically emphasizes locality, business and economic base, and resources for both employees and community (Blakely & Bradshaw, 2002). Location on it's own is not specifically the factor for local economic development, but rather the assets within locations, such as human resource and natural resource base that can lend to a draw to local ammenities Similar to CED, LED also includes developing partnership and collective action amongst many different groups of residence, organizations, businesses and institutions. By forming new networks and clusters it allows organizations to benefit each other, rather than having to provide specific incentives for companies to come to a place (Blakely & Bradshaw, 2002).

Community Economic Development (CED), like Local Economic Development, seeks to build capacity for groups that may be disadvantaged or have a lack of community support. Community values are pertinent to CED processes as they provide direction for the work within

many different locales and neighborhoods (Booth & Fortis, 1987). CED assists in developing workforce opportunities, leadership skills, visioning processes, etc. for neighborhoods or specific groups of individuals within a location (Christensen & Phillips, 2016). A concern with community economic development is the lack of shared measurements and evaluation metrics (Booth & Fortis, 1987), however, there are opportunities through CED processes to develop place-based metrics and evaluations that are particular to the community locale. These methods of place-based evaluation and determining local, community-based, values lead to success measures, that can generate additional accountability to community members that are participating in the process (Flora, 2017). CED promotes a platform in which members live and connect with one another and build a social fabric together (Korsching & Davidson, 2013). It can be seen as the merging of both the field of community development and economic development to be used for community improvement in a place-based setting (Christensen & Phillips, 2016). Due to the versatile scale and nature of CED, this research will utilize a CED lens to assess and discuss community economies in regards to community food systems. This presumes that there are values instilled in each place, that are community defined, that connects individuals to one another and to the assets in the area, leading to intentional development of place-based community resources (Feenstra, 2002; Dixon, 2011).

Within the community economic development lens, understanding how community actors (individuals, organizations, businesses, amenities, etc.) interact with each other can assist in the development of needed community assets (Emery and Flora, 2006; Prabhakar et al., 2014; Ruhf et al., 2017). According to Wilkinson's generalizing structure, "communities form linkages between individuals, organizations and agencies to integrate, coordinate, reinforce and mobilize common elements of their differentiated special interests for the community's welfare"

(Brennan, Frumento, Bridger, & Alter, 2013). This dissertation uses the definition of community economic development process as the collective action within a placed-based community that leads to an intervention in which community members co-create accountable development and action towards economic, social, cultural, or environmental change (Sites, Chaskin, & Parks, 2007; Sharp, Jackson-Smith, & Smith, 2011; Christensen & Phillips, 2016).

There are several community economic development frameworks used to bring together actors within a system to assess, focus, and determine appropriate next steps that supports cross-discipline and transformative discussions through multi-tiered understanding of the community (Partelow, 2018; Marshall, 2015). Examples of these frameworks include Collective Action Theory and Social-Ecological Systems Framework, which can support cross-discipline and transformative discussions through multi-tiered understanding of the community (Partelow, 2018; Marshall, 2015). Adaptive Decision-Making frameworks help understand adaptive capacity in response to disaster or disaster management (Prabhakar, Wright, & Tsurita, 2014) and National Sustainable Development Strategy includes economic and ecological understanding of the community in an effort for resiliency (Bass & Dalal-Clayton, 1995). The Community Capitals Framework offers insights for community development that suggests the needed understanding of community based on capitals, or assets, which include natural, cultural, human, social, political, financial and built capitals (see Table 1-2 definitions)

Table 1-2: Definitions of Community Capitals based on Community Capitals Framework (Flora & Flora, Rural Communities, 2008, pp. 17-18)

<i>Community Capital</i>	<i>Definition</i>
<i>Natural Capital</i>	"Landscape, climate, air, water, soil and biodiversity"
<i>Cultural Capital</i>	"Values and approaches to life...the filter in which people live their lives...rituals they observe and the way they regard the world around them"
<i>Human Capital</i>	"Skills and abilities of each individual, including informal and formal education, health and leadership"

Table 1-2 Continued

<i>Community Capital</i>	<i>Definition</i>
<i>Social Capital</i>	“Networks, norms of reciprocity and mutual trust that exist among and within groups and communities...contributing to common identify and shared future...bonding (multiple links that enforce trust) and bridging (single-purpose linkages) are important forms of social capital”
<i>Political Capital</i>	“Ability to influence the standards of the market, state or civil society, including codification of standards in laws and contracts...organization, connections, voice and power”
<i>Financial Capital</i>	“Money that is used for investment for additional value”
<i>Built Capital</i>	“Infrastructure that supports other community capitals such as factories, schools, roads, habitats, community centers, etc.”

The framework used within a community-economic development lens for this research is the Community Capitals Framework because of the flexible nature and intersectionality. It has many opportunities for intersection with food systems as well as development and understanding of resilient community food systems.

Food Systems

The food system is comprised of more than just producers and buyers. Food systems connect local and global scales and have different areas of participation and possibilities from policy creation, nutrition, and food security; and include areas of interest like locally grown, sustainably raised, democratic participation, and community and economic development (Feenstra, 2002; Christensen & Phillips, 2016). Food Systems encompass an array of sectors: production, processing, distribution, consumption, and resource management (Long, 2017; Chase & Grubinger, 2014) and have a systemic nature that directly and indirectly impact community capitals as well as organizations, businesses, and individuals (Ruhf, et al., 2017; Schipanski, et al., 2016). Systemic issues involving food systems include food access, ecological processes, infrastructure including transportation, social justice and waste reduction (Long, 2012; Winne, 2008; Schipanski, et al., 2016); inclusion and equity for employment both for access to workforce development (Hughes & Boys, 2015); as well as fair wages that allow individuals and families to adequately support themselves (Winne, 2008); and place-making for cultural identity

and community assets can be shown through civic agriculture, gardens and edible landscapes (Feagan, 2007).

“Local” has become a common term and interest for individuals, organizations, and institutions to revitalize and develop their place-based community. As many economies have continued to grow into the global spectrum, food systems have as well, moving into commodity and industrial systems to feed the world (Feenstra, 2002). According to Feagan, many people involved in efforts for local food believe that they can “rework power and knowledge relationships in food supply systems that have become distorted by increasing distance between producers and consumers” (Feagan, 2007). To that point, one must first understand why local is important and what it means.

Many definitions for local food systems exist, including the “incorporation of meanings and purposes of food (cultural, environmental, social, economic, and political) as well as production, processing, distribution, access, and consumption; and is considered local based on the flow of food from production to consumption within a defined area” (Christensen & Phillips, 2016). The term “local” can also be used to reference different spatial units ranging from city or state boundaries to a number of radial miles from a specific location (Thilmany McFadden, 2015). One way to understand local food systems, is the direct relationship with their farmer or business owner (DeLind, 2011). Some individuals catch on to the local movement as an effort to contribute to the overall economy (Christensen & Phillips, 2016). Others look at local as a place-based effort to revitalize and build community and a sense of place (Campbell, 2004), with place-based referring to a location or region that is impacted from those sales and purchases. Thus, local is a challenging term because it portrays different meanings and values of individuals. Local has a strong place-based attachment to a locale and is most interested in

opportunities for place-based producers and buyers to connect and in turn build economic regeneration for that locale (Thilmany McFadden, 2015).

Regional food systems have a different approach to place-based food systems. Regional food systems are still connected to opportunities for economic growth and sales within a locale, but typically involve a larger food-shed and consider the distribution area as the context or place (Horst & Gaolach, 2014). The term food-shed is used to describe the area that food moves from producer to consumer (Horst & Gaolach, 2014). Within this case, purchases and sales are not the only means to the food system strategy; it also contributes to local culture, social connections and sense of pride and self-sufficiency (Dixon, 2011). Development of local agriculture and local food businesses offer a taste of the place and rein in on unique cuisine and can contribute to financial sustainability by promoting local farm businesses, food retailers, institutions and customers to buy and sell from each other creating a closed circle of financial resources (if in alignment) (Abate, 2008).

While LFS encourages place-based development and relationships between producer and consumer, regional food systems focus on sales and food-shed. A third concept is a community food system approach which tends to be more tied to the social fabric of the place. Community Food Systems (CFS), like regional and local, are place-based systems, but they are determined in scale by its constituents. CFS allow for all members to equitably engage in the food system from production, processing, distribution, consumption, and resource management (Long, 2017). A CFS is typically defined from a community process that assists in utilizing community knowledge to inform decisions about food systems creation (Feenstra, 2002). The goals of which are to create a system, process and infrastructure, in which food travels, while also contributing to essential community capitals, including areas of policy, equity, economy, wellness,

environmental stewardship, built infrastructure, and education (Feenstra, 2002; Campbell, 2004; Long, 2017).

Community food systems have evolved to include civic agriculture and forms of philanthropy, good will, engagement, and contributions to equity. Community food systems offer options to invite participation from community members (Dixon, 2011), which allows further engagement and connections to the community. This includes a collective approach for developing a systemic vision for the community and then determining priority areas of development which may include:

- access to job opportunities in farm and food businesses as well as offer fair compensation (Feenstra, 2002);
- critical needs such as food access, ecological processes, infrastructure including transportation, social justice, and waste reduction (Long, 2012; Winne, 2008; Schipanski, et al., 2016),
- inclusion and equity for employment both for access to workforce development (Hughes & Boys, 2015) as well as fair wages that allow individuals and families to adequately support themselves (Winne, 2008), and
- place-making for cultural identity and community assets can be shown through civic agriculture, gardens, and edible landscapes (Feagan, 2007)
- creating policies for food access, civic agriculture, and environmental considerations (Christensen & Phillips, 2016);

This research focuses on CFS, with a definition being a values-based, relational, interconnected web of activities that is based on a collective effort for the development of

resources and people, which extends across all sectors of the food system (see Table 1-3). (Chase & Grubinger, 2014; Christensen & Phillips, 2016; Feenstra, 2002; Long & Hohenshell, 2019).

Table 1-3: Food System Sector definitions, adapted from the Iowa State University Community Food Systems Program

<i>Food System Component</i>	<i>Definition</i>
<i>Cultivation and Harvesting</i>	science, art, or occupation of cultivating land, raising livestock, hunting, fishing, foraging or farming
<i>Processing and Transformation</i>	transformation of raw ingredients, physically or chemically, into a value-added product
<i>Distribution and Marketing</i>	moving product from initial location or processing site to market or consumer
<i>Food Access and Consumption</i>	Family and individual access to food in a physically safe, financially viable, and culturally competent way
<i>Resource Stewardship</i>	Care and stewardship of natural resources, such as air, land, water, soil, plants, foods and created materials

Community food systems, when utilizing a community development process are participatory-based and invite participation from community members (Dixon, 2011). From this, goals can be identified that are place-based, according to unique values, process and infrastructure, and community capitals that intersect with their food system. This includes developing a systemic vision for the community and determining priority areas of development. Systems thinking is necessary with community food systems and community development processes for considering different sectors, scales, and food system actors (Ruhf et al., 2017; Himanen et al., 2016).

Resilience

With the interconnections of community capitals and community food systems, it is also necessary to acknowledge evolving concerns around ecological shifts, increased disasters prevalence, rural population decline, and general livability for future generations (Fainstein, 2014; Lin & Chang, 2013; Nelson, Zak, Davine, & Pau, 2016). Disasters are generally described into two categories, man-made and natural (Zibulewsky, 2001). All individuals and communities

across the globe respond to disasters with sudden, intermittent, and long-term shocks (FEMA, 2023). Every community has different vulnerabilities that are impacted differently when sudden shocks (e.g., catastrophic weather events), intermittent shocks (e.g. price volatility), and gradual pressures (e.g. climate change and shifting human diets) occur (Schipanski, et al., 2016).

Vulnerabilities and the prevalence of climactic events, pandemics, and other gradual pressures, show the need for improved resilience for community food systems.

While there is research on farmer impact, supply chain infrastructure, and general community development as it relates to food, there is little research that showcases ways to improve resilience for a community food system. Understanding the impact of changes and shifts that occur within community is a critical first step in developing a resilient community food system (Vermeulen, Campbell, & Ingram, 2012; Schipanski, et al., 2016; Himanen et al., 2016).

Common attributes of resilience include three areas, first, the ability to respond to shocks and stressors; second, a temporal focus on long-term effects from the initial shock or stressor; and third, the need for action at multiple levels or scales (individuals, households, communities, and systems) (Harris & Spiegel, 2019). Shocks are viewed as the sudden and immediate disasters such as a hurricane, tornado, or flood that impact food production, food access, and potentially infrastructure of the food supply chain; stressors are then the long-term impacts and trends that are seen after a shock that are gradual (Harris & Spiegel, 2019).

Communities must understand how shocks and stressors impact their community to further assess and measure resilience and develop resilient strategies to aptly respond, recover, and rebuild as a community (McCarthy & Wolnik, 2019). There is an opportunity to utilize community development processes in support of developing community food systems that can identify vulnerabilities within the system, withstand disasters and promote resilient livelihoods in

eras of change (Lin & Chang, 2013; Schipanski, et al., 2016; Ruhf et al., 2017). Within a food system, there are vulnerabilities that are embedded within community capitals. Harris and Spiegel specifically speak to financial and natural capital as being areas that can be better managed for resilience compared to other community capitals (Harris & Spiegel, 2019). Conducting assessments of vulnerabilities, including power relations, social connections, cultural relevance, or environmental conditions, are vital to understand and develop a resilient method for the future (Lin & Chang, 2013). In addition to identifying vulnerabilities, communities need to understand disruptions that may occur and the impact they could have on existing conditions, so they are able to plan response and recovery for shocks and stressors (Fainstein, 2014; Campanella, 2006).

Due to the complexity of a RCFS, identifying partners in place and major players that affect the dynamics of the system is important (Brennan, Frumento, Bridger, & Alter, 2013; Harris & Spiegel, 2019; Himanen et al., 2016; Schipanski, et al., 2016). Because of the systemic nature shown between community capitals, food systems and resilience, there is not a one-size fits all framework for creating a resilient community food system (Dixon, 2011; Christensen & Phillips, 2016). The dissertation makes a case for a new framework of resilient community food systems (RCFS) that can be used through community development processes as a way to understand and identify preparedness, response, and recovery options. For purposes of this research, we define resilient community food systems (RCFS) as the capacity for a place- and values-based food systems, and the actors within, to withstand shocks and disruptive pressures while maintaining basic structures, processes and functions of and within the community food system and supply chain, ensure the ability to produce and access nutritious and culturally

acceptable food over time and space, and create a new normality (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020).

Community Actors and Organizations

There are many actors that may be involved in this intersectional work. The first is the individuals that live within communities. Community actors include both formal and informal leaders and those specifically actively engaged in community decision making (Emery & Flora, 2006; Prabhakar S. , et al., 2014). Within the context of a resilient community food system, table 1-4 provides a review of types of actors.

Table 1-4: Community Actor Types based on research and connection from Community Food Systems and Community Capitals

Community Food Systems	Community Actors interviewed
Cultivation and Harvesting	Gardeners and homesteaders, farmers, fishers, hunters
Processing and Transformation	At home food processors, shared-use kitchen managers, value-added business creators, and processing facility managers
Distribution and Marketing	Community Supported Agriculture business owners; food box and food hub managers, farmers market managers, grocery store managers, school dining and nutrition directors, and food bank managers
Food Access and Consumption	Food pantry and meal program coordinators, college and hospital dining directors, state departments of public health and nutrition, restaurants and food truck owners, Food System Policy Councils and Coalitions
Resource Stewardship	Natural Resource and Conservation district personnel, Department of Natural Resource personnel, Land Trust coordinators; Fishery and Coastal Management coordinators, non-profit organizations working to reduce waste, and gleaning program coordinators
Community Capitals	Community Actor interviewed
Natural Capital	Individuals listed in cultivation and harvesting and resource stewardship, Land-Grant University Campus Faculty & Staff working in areas of agriculture, FEMA staff,
Cultural Capital	Indigenous organization coordinators, Latinx community members, residents, community foundation staff, Land-Grant University Campus Faculty & Staff working in community
Human Capital	Residents, school and college administrators, employers
Social Capital	Residents, city council and elected officials, individuals involved in networks, coalitions and boards, Land-Grant University Campus Faculty & Staff working in community
Political Capital	Elected officials; city, county, and state departments; University staff members; board members for non-profits
Financial Capital	Bank staff, economic development authority personnel, lending organization staff, business owners
Built Capital	All individuals within community food systems; City, county, and state departments;

The first type of community actor is the individual. An individual's values impact their participation in community and their behaviors. Individual values have been researched

extensively, ranging from types of values individuals possess, which include intrinsic and extrinsic characteristics (Furness & Nelson, 2016; Norvdall, 2014; Pascual, et al., 2017; Schroter M., et al., 2020). According to Wilkinson's generalizing structure, "communities form linkages between individuals, organizations and agencies to integrate, coordinate, reinforce and mobilize common elements of their differentiated special interests for the community's welfare" (Brennan, Frumento, Bridger, & Alter, 2013). The inclusion of understanding values and attitudes within RCFS is critical because these systems are set up based on community values and important characteristics of individuals (Feenstra, 2002). Within RCFS, we focus on further assessing how an individual's values impact their food buying patterns (specifically around CFS) as well as their participation in community. We assess the intersection within the context of resilient community food systems, to understand how community actors interact with each other, what they value, and how they participate in community to potentially enhance resilience (Emery and Flora, 2006; Prabhakar et al., 2014; Ruhf et al., 2017).

The second type of community actor is community organizations, institutions, and government partners. Of particular interest in this research is Land-Grant University Extension (LGU-E). All U.S. states and territories have at least one LGU-E that is tasked with providing education and outreach through research-based practices. Land-Grant Universities receive funding through the Morrill Acts of 1862 and 1890 and 1994 (Association of Public and Land Grant Universities, 2019), and are equipped to work across and within disciplines (Clancy, 2017). The Morrill Act of 1862 provided 30,000 acres of public land per senator and congressman in each state, leading to 17,430,000 acres of land to the public (McDowell, 2003). The public land identified from the Morrill Act and distributed to LGUs was stolen from indigenous populations (Copeland, 2022), and with the sale of the land, allowed for LGUs to

profit and start an educational system (The Editors of Encyclopaedia Britannica, 2017). Of note, the Department of Agriculture was also created in 1862, which was closely aligned with organizing and working with Land Grant Colleges (Seals, 1991).

Following, the Morrill Act of 1890 provided additional support to historically black colleges (HBUs or 1890's), starting with sixteen southern states, and forbid racial discrimination within admissions policies for colleges (Copeland, 2022). Not until 1994 did 30 Native American Tribal colleges become included in the LGUE programming through Improving America's Schools Act of 1994 (Kowalkowski, Frieson, & Phillips, 2022), and Hispanic-serving institutions didn't become eligible until 1998 under the Agricultural Extension, Research and Education Reform Act (Mercier & Halbrook, 2020).

In 1914, Extension became associated with the LGUs through the Smith-Level Act (Association of Public and Land Grant Universities, 2019), leading to Land-Grant University Extension (LGU-E) objectives of teaching agriculture and providing outreach and education to community members about access to safe and affordable foods (Schneider, 2014). The Smith Lever Act specifically connected Land Grant Universities with USDA, leading to dissemination of research across each state and the Nation related to the findings at experiment stations (Mercier & Halbrook, 2020). While USDA had agricultural outreach and demonstration work occurring, the development of Land Grant University Extension (LGU-E) allowed for instruction and outreach to occur across the nation (Mercier & Halbrook, 2020). To do this, funding was allocated from legislation to each state, also mandating that funds were matched from the states; within only ten years, 2500 county agents were employed across the country (Mercier & Halbrook, 2020).

LGU have been instrumental in developing higher education and learning opportunities for agriculture, including the development of the agricultural knowledge and information system (AKIS) (McDowell, 2003). AKIS has largely included research of highly productive crops and economic impacts, however, these efforts have led to a decrease in farmers producing food and fiber and has created more large, less diversified farms and markets (McDowell, 2003). At the time of the Morrill Act in 1862, 60 percent of the people of the nation were engaged in farming; today that number is less than 2 percent (McDowell, 2003).

Rapid community changes are forcing LGU-Es to consider their response and ability to support community-based needs (Byrne, Outreach, Engagement, and the Changing Culture of the University, 2016). Changes are found in social conditions, economics, environment, policy, demographics, technology, and pandemics (Copeland, 2022). According to Byrne, there has been “apparent failure of higher education to keep pace with societal change and to meet additional challenges of declining funding, increased accountability, and shifts in public attitudes...” (Byrne, Outreach, Engagement, and the Changing Culture of the University, 2016, p. 53).

While the Morrill Act has let to many positive aspects of public education, there is still much learning to be done on how this has impacted communities nationwide. The Association of Public and Land-grant Universities (APLU) convened a group of individuals from Inter-Institute Network of Food, Agriculture and Sustainability (INFAS) to assess the role of public and LGU-E institutions on global food security, including a Challenge on Change report detailing seven challenges from areas of availability, access and utilization of food (Association of Public and Land-grant Universities). There is a declining number of farms that have occurred potentially due to the Morrill Act, other issues regarding land equity and sovereignty continue. The Morrill Act provided public land to individuals to support the funding of land grant colleges, however,

this land was largely owned by Indigenous nations across the country (INFAS: Inter-Institutional Network for Food, Agriculture and Sustainability, 2018). In a response to the Challenge of Change, members from INFAS developed a follow-up report to detail the need for an anti-racist lens on the language from Challenge of Change. INFAS shared the need for collective change both around systemic food systems shifts in production, distribution, and consumer behavior, and emphasized a more critical first step in acknowledging and supporting empowerment of diverse populations and communities (INFAS: Inter-Institutional Network for Food, Agriculture and Sustainability, 2018). Based on this report, LGU-E suggestions for change include elevating community empowerment and agency amongst community members, developing community partnerships, aligning university resources with transdisciplinary approaches geared at systemic solutions, and educating new generations to be systems and transdisciplinary thinkers (INFAS: Inter-Institutional Network for Food, Agriculture and Sustainability, 2018).

LGU engagement within the community is necessary to repair and build trust and is typically conducted through Extension and scholarship. The goal of outreach is to reach out to the public and transfer knowledge from research and finding of the university to the public. Engagement supports both the dissemination of information from the university, but also the learning from the public and co-creation and partnership (Byrne, 2016; McDowell, 2003). The opportunity for LGU-E to participate and support in RCFS is connected to the need for engagement with community and response to place-based needs relating to farms, businesses, and communities (McDowell, 2003). Support and technical assistance is needed to fully assess, understand and develop a resilient community food system (Himanen et al., 2016; Clancy, 2017), including research across food system components such as production, processing, and general supply chain activities, and community capitals as well as critical equitable considerations

(Winter-Nelson, 2016; INFAS, 2018; Clancy, 2017; Galt et al., 2012; Sitaker et al., 2014). While challenges and changes of LGU-E are ongoing, LGU-Es are still equipped to support in the response and change for resilience as they have shown a staying power and active engagement within communities, agriculture, youth, and human development since inception. LGU-E may be uniquely positioned to respond to the need for RCFS due to their transdisciplinary nature that includes community development processes, if they are able to restore relationships and build trust with community members (Galt, Clark, & Parr, 2012).

Hypothesis and Conceptual Framework

The following hypotheses have been formed regarding RCFS and LGU-E support:

1. Sound infrastructure, buffering capacity to withstand shocks throughout the supply chain, leadership and social capital within the community, and political support for returning to equilibrium are significant place-based qualities for resilient community food systems.
 - Natural, built, and social capitals are the most pertinent for assessing resilient community food systems
2. Community residents with strong relationships in the with community and have experienced a disaster as a community (natural or human-based) are more likely to support RCFS.
 - Individual values that support local and regional food businesses and interest in buying local, enhance the ability for resilience and adaptive capacity
3. LGU-E can improve capacity for RCFS through technical assistance and community capacity support

- LGU-E can improve capacity if repair from harm to community members is done, and new trust and relationships are formed

Figure 1-1 presents a conceptual framework for place-based community development (PBC) for resilient community food systems.

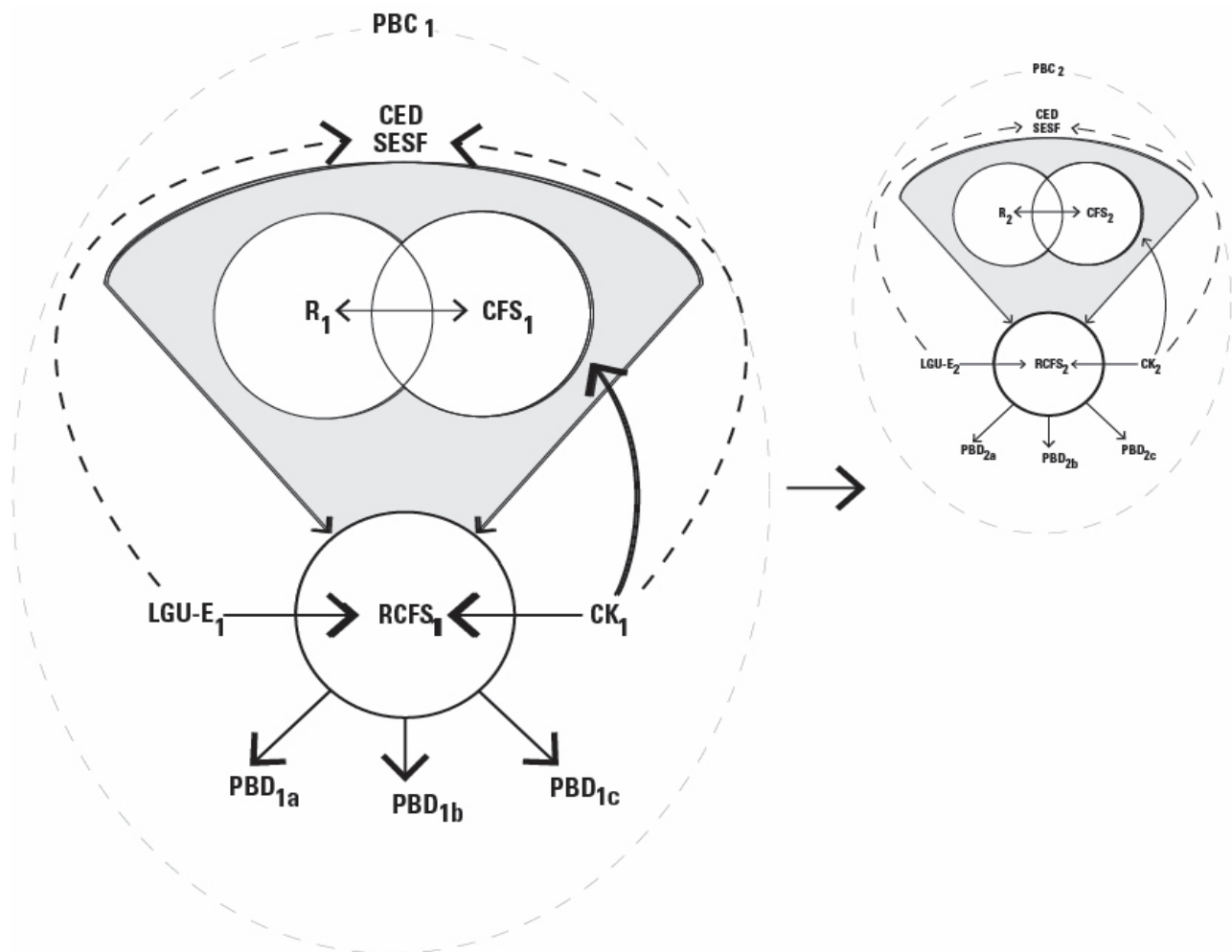


Figure 1-1: Initial Resilient Community Food Systems Conceptual Framework

Community Economic Development (CED) with a flexible social-ecological systems (SES) and collective action theory, can be utilized to assess, determine, and plan resilient community food systems (RCFS) based on community knowledge (CK) and participation from

Land Grant University Extension (LGU-E). Community Food Systems (CFS) and Resilience (R) are intertwined and support each other in their unique, place-based features such as geography, necessity, population, and climate leading to a resilient community food system (RCFS). To fully assess and determine the needs for a RCFS, (CK) and wisdom is necessary, along with key identification of place-based indicators (PB a, b, and c) of the community food system environment, that can be supported from LGU-E. Place-based indicators that will be utilized in addition to community knowledge and perceptions, is production (PBa), processing and distribution (PBb) and retail (PBc). The conceptual framework suggests that with a CED lens and SES framework, this research can develop a RCFS assessment process that can be universally applied for place-based communities, this is shown through the numeric signs '1' in the primary visual and leading to a second conceptual framework with numeral '2'.

Study Area

Research was conducted in five place-based communities across the U.S between 2020-2022. Each experienced different types of natural disasters and climactic events (shown in Table 1-5) as well as the manmade disaster, COVID-19. Table 1-5 details each place-based, partner organizations, disaster type, and research participation. Table 1-6 details the perceived existing conditions for community food systems and LGU-E indicators of funding and staff capacity for community food systems support, as well as interest in the area of resilient community food systems. These were developed based on information shared during interviews, focus groups, and site visits.

Table 1-5: Community Participation in RCFS research

COMMUNITY	PLACE-BASED COMMUNITY	PARTNER ORGANIZATION	DISASTER IN ADDITION TO COVID-19-19	RESEARCH PARTICIPATION
ALASKA	Rural: Kenai Peninsula	University of Alaska Extension and Outreach, Alaska Food Policy Council and Homer Soil and Water	Swan Lake Fire- 2019; additional climate events (flood, drought, ice, etc.)	7 interviews 2 focus groups (6 participants) 35 survey responses, completion rate 1.5%
ARKANSAS	Suburban: Washington and Benton County	University of Arkansas Extension and Outreach	Strong winds and tornado- 2017; additional climate events (flood, drought, ice, etc.)	13 interviews 1 focus group – 6 participants 109 survey responses, completion rate 16%
IOWA	Rural: Marshall County	Iowa State University Extension, Marshall County Extension	Derecho- 2020 and Tornado -2018	19 interviews 2 focus groups – 6 participants 35 survey responses, completion rate 5%
TEXAS	Rural: Bastrop County	Texas Center for Local Food	Lost Pines Fire – 2011; additional climate events (flood, drought, winter storm, etc.)	17 interviews 5 focus groups- 12 participants 76 survey responses, completion rate 18%
US VIRGIN ISLANDS	Regional: Territory	Virgin Islands Good Food Coalition	Hurricane Irma and Maria – 2017	12 interviews 3 focus groups – 17 participants 18 survey respondents, completion rate 3.8%
TOTAL				68 interviews 13 focus groups: 47 participants 273 survey participants

Table 1-6: Community Indicators: CFS and LGU-E

COMMUNITY	COMMUNITY FOOD SYSTEM	LGU-E CAPACITY	COMMUNITY
	Production and Resource Management	Processing, Distribution and Consumption	
ALASKA – KENAI PENINSULA	Local production: self-sufficient agriculture including wild harvesting, minimal specialty-crops practices National/ global: wild-caught seafood	Local: limited paved roads and access to processing facilities/ storage/ etc. National/ global: fish processing and distribution	1862 Extension Land Grant: University of Alaska Funding: low Staff: low Interest: moderate

Table 1-6 Continued

COMMUNITY	COMMUNITY FOOD SYSTEM	LGU-E CAPACITY	COMMUNITY
ARKANSAS-BENTON AND WASHINGTON COUNTIES	Local production: specialty crops and diversified agriculture National/ global: grains, livestock,	Local: limited processing options with some meat and poultry processors and shared use kitchens; potential for shared distribution through food hubs National/ global: meat processing, access to large markets such as Tyson, Walmart, and Cargill; well serviced roads and connections through county	1862 University of Arkansas Fayetteville Funding: moderate Staff: moderate Interest: moderate 1890 University of Arkansas Pine Bluff Funding: moderate Staff: moderate Interest: moderate
IOWA-MARSHALL COUNTY	Local production: specialty crops and diversified agriculture National/ global: grains, livestock, and seed	Local: adequate distribution channels, lack of storage and processing facilities for both specialty crops and small-scale livestock National/ global: meat processing and distribution through JBS; well serviced roads and connections through county	1862 Extension Land Grant: Iowa State University Funding: moderate Staff: high Interest: high
TEXAS – BASTROP COUNTY	Local production: specialty crops, diversified agriculture, niche meat National/ global: grains, livestock, and poultry	Local: shared-use kitchen and education facilities; limited distribution connections for county wide local food sales National/ global: meat and poultry processing; well serviced roads and connections through county	1862 Extension Land Grant: Texas A & M Funding: low Staff: low Interest: moderate 1890 Extension Land Grant: Prairie View A & M University Funding: unknown Staff: unknown Interest: unknown
US VIRGIN ISLANDS	Local production: self-sufficient agriculture including wild harvesting, minimal specialty-crops practices National/ global: peanuts, fish, rum (Cruzan Rum/ Captain Morgan)	Local: limited and unmaintained roads, limited access to barges and air transportation, limited access to animal processing facilities/ storage/ etc. – no access to specialty crop processing National/ global: distilleries, fish shipping	1862 Extension Land Grant: University of the Virgin Islands Funding: low Staff: low Interest: moderate

Methods and Data Collection

To assess the perception of community development, community food systems, and resilience amongst community actors, a mixed methods research design (Hesse-Biber, 2010) was used with appreciative inquiry interviews, a participatory-based foresight focus group (Patton et

al., 2015; Hebinck et al., 2018; Himanen et al., 2016; Ruhf et al., 2017) followed by an individual survey to assess values and individual impact (see Figure 1-2).

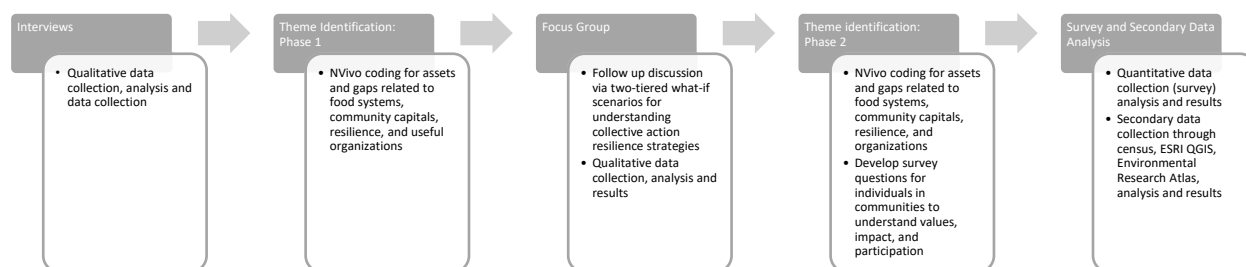


Figure 1-2: Sequential Exploratory Mixed Methods Design Chart Excerpt adapted from Hesse-Biber, 2010 pg. 463

Interviews and participatory-based foresight focus groups were planned with each partner organization in each state (Table 1-5), who also provided insight into appropriate community outreach for participation. Community actor types who participated in interviews and focus groups are shown in Table 1-7.

Table 1-7: Community Actor Interview Types reviewed by community food system sectors and community capitals

Community Food Systems	
Cultivation and Harvesting	Gardeners and homesteaders, farmers, fishers, hunters
Processing and Transformation	At home food processors, shared-use kitchen managers, value-added business creators, and processing facility managers
Distribution and Marketing	Community Supported Agriculture business owners; food box and food hub managers, farmers market managers, grocery store managers, school dining and nutrition directors, and food bank managers
Food Access and Consumption	Food pantry and meal program coordinators, college and hospital dining directors, state departments of public health and nutrition, restaurants and food truck owners, Food System Policy Councils and Coalitions
Resource Stewardship	Natural Resource and Conservation district personnel, Department of Natural Resource personnel, Land Trust coordinators; Fishery and Coastal Management coordinators, non-profit organizations working to reduce waste, and gleaning program coordinators
Community Capitals	
Natural Capital	Individuals listed in cultivation and harvesting and resource stewardship, Land-Grant University Campus Faculty & Staff working in areas of agriculture, FEMA staff,
Cultural Capital	Indigenous organization coordinators, Latinx community members, residents, community foundation staff, Land-Grant University Campus Faculty & Staff working in community
Human Capital	Residents, school and college administrators, employers
Social Capital	Residents, city council and elected officials, individuals involved in networks, coalitions and boards, Land-Grant University Campus Faculty & Staff working in community

Table 1-7 Continued

Political Capital	Elected officials; city, county, and state departments; University staff members; board members for non-profits
Financial Capital	Bank staff, economic development authority personnel, lending organization staff, business owners
Built Capital	All individuals within community food systems; City, county, and state departments

Data collection occurred over a series of steps. First, appreciative inquiry interviews were conducted with different actors to understand current conditions of RCFS related to CDp. Second, transcripts were reviewed and coded. Third focus groups were conducted in person in each community, utilizing participatory foresight process to encourage collective thinking on “what-if” scenarios for response in the future to manmade and natural disasters. Fourth, focus group transcripts were coded within the same framework as interviews, allowing for additional codes and themes to arise. Last, an individual survey was developed based on codes. Surveys were disseminated to community members through partner listservs.

Interview questions started with broad community perspective questions of assets and limitations, and then homed in on more specific questions for developing ideas for progress moving forward (Gaffey, 2013). Each interview lasted between 30-60 minutes. Following interviews, each community held in person focus groups that responded to two participatory foresight questions, one based on local-disaster related to future planning, and the second related to the most recent national pandemic of COVID-19. Foresight has been shown to support the visioning of the desired future and the co-development of strategies and planning for systems transformation (Hebinck, Vervoort, Hebink, Rutting, & Galli, 2018). This collective action process allowed participants to collectively share what occurred during each disaster and their opinions on what would need to occur differently if a similar situation occurred (Himanen, Rikkinen, & Kahiluoto, CFodesigning a resilient food system, 2016). The data collected was then used to determine appropriate questions for an individual survey that was shared through

listservs from community partners to understand core values, and individual impacts from COVID-19 and natural disasters. To conclude the participatory process, overall interpretation was prepared in a report of findings as a snapshot for each community. In addition to the research methods described, secondary data based on indicators for resilience, community food systems, and community development were identified to share context with communities.

Analysis

This multi-faceted approach, across all five communities, allowed for easier triangulation of data and analysis both within and across the cases. Interviews allowed for improved understanding of the existing conditions, scope, and relevance of the community food system and the capacity that organizations and individuals had to be involved. Focus groups provided feedback on needed changes for the community food system to be more resilient. Focus groups discussed insights on what went well, and what should be done differently both for natural disasters and for COVID-19. The survey focused on the public feedback and individuals' values, their participation in community and food purchasing behaviors and their personal impacts from natural disasters and COVID-19. The survey offered a more quantitative approach to identifying key factors that individuals were considering related to involvement in the community and the community food system.

Qualitative data from interviews and focus groups were aggregated into NVivo for analysis. Initial themes were developed based on community capitals, community food systems, resilience literature, and support organizations (as described in Table 3). Themes were then used during a second review of transcripts, in which additional aspects and nuance were coded related to strengths, challenges, and opportunities across each of the primary themes.

Quantitative data was analyzed in excel to compare responses from individuals across and within communities. Data was compared across community to understand common

participation in community, individual values, importance of local food and farms, shopping patterns, and impacts from natural disasters and COVID-19.

Qualitative and Quantitative data were then compared and analyzed to understand commonalities. All of those who participated in qualitative research were seen as key actors of community food systems, while quantitative data collection was with the public.

Limitations

This research was conducted during COVID-19. It was initially planned to only compare the impacts of a natural disaster in each study area on the food systems, but later included the pandemic's impact to the study because it was such a dominate force with significant implications. While the inclusion of COVID-19's impact was timely, literature review on pandemic and natural disaster impacts of community food systems were less than exhaustive. The pandemic also impacted the ability to connect both virtually and in-person with participants in the study. Although individuals were willing to connect virtually, the breadth of participation in person was limited, for example during travel for focus groups, many communities were going through new variants of COVID-19 which had individuals uncomfortable participating, or businesses and organizations closing. In some instances, the study team also ran into natural disaster shocks as well, experiencing severe weather while on site, limiting the ability for individuals to travel to focus group sites. Additionally, participation in survey response was low. One potential for this is the amount of virtual and computer burn out that occurred through COVID-19, and the increase in social surveys and requests for information on the impact of COVID-19 on various aspects of life. Surveys were shared through partner listservs, and the low response could be an indicator of the participation of individuals in each organization's outreach methods. Additionally, this initial research could have been improved, particular for analysis purposes, by providing specific definitions for each value. When reviewing data and presenting

findings to communities, it was clear that values could be interpreted in various ways, beyond the initial thoughts of the research team.

Organization

This dissertation is organized as a journal-dissertation format and includes the following three chapters structured for submission as individual journal article manuscripts. It also includes this introduction chapter and the conclusion chapter which will introduce and conclude the dissertation paper. Each of the body chapters will stand alone and represent an area of consideration for the dissertation topic: resilience, adaptive capacity, and transformation; community resident's values and attitudes towards resilient community food systems, and organizational usefulness, with a specific focus on Land-Grant University Extension, within resilient community food systems. Each chapter will have its own works cited and tables associated, with a general works cited following the general conclusion.

The second chapter addresses the intersections between community food systems, community capitals and resilience. The chapter describes the dimensions of RCFS and their place-based qualities through the Community Capitals Framework and includes common characteristics of RCFS among case study communities as it relates to resilience, adaptive capacity, and transformation. The primary questions of the chapter include:

- What are the impacts to the supply chain of sudden, intermittent, and long-term shocks?
- What are the necessary place-based qualities to make a community food system resilient?
- Which are the most common community capitals addressed in creating resilience?

The primary finding within the chapter is that while built, natural and social capital are the most discussed capitals for resilience as it relates to community food systems, all are critical in response. This includes sound infrastructure, buffering capacity to withstand shocks

throughout the supply chain, leadership and social capital, and political support for returning to equilibrium. To show this, the chapter begins with a review of community capitals, community food systems, and resilience. It utilizes the research methods mentioned previously across five community case studies to compare intersections of impacts from natural disasters and COVID-19. It also describes the level of resilience, and particular qualities identified as most significant in mitigation, response, and recovery. Case study research includes review, analysis, and comparison of place-based community interviews, focus groups and surveys. The chapter also includes discussion on the impact the multiple disasters have on community members, including increased stress and disaster fatigue (Olshansky, Hopkins, & Johnson, 2012). This in turn connects to the need for adaptive capacity, preparedness, and the ability to respond. The chapter contributes to existing literature through a new conceptual framework for understanding resilience, adaptive capacity through the lens of community capitals and community food systems.

The third chapter details the common attitudes and perceptions of RCFS from individuals within each community. The chapter compares interviews, focus groups, and survey data regarding specific questions on individual's values, their engagement in community, support of food and farm businesses, and their food buying patterns. The chapter includes individual interest in local food and farm businesses and involvement with, and concern for, transdisciplinary aspects, shown through a comparison of community capitals (environment, economy, social, built, human, cultural, and political capitals). The primary question of the chapter include:

- Who are the community actors that assist in forming a RCFS?
- What are the perspectives of community members regarding what makes a RCFS?

- What are the attitudes of community residents that support and challenge RCFS?

The overall hypothesis of the chapter was that community residents that have relationships within their community and have experienced a disaster (natural or human-based) are more likely to support RCFS. However, it was difficult to assess the direct connection of individuals engagement pre- and post- storm beyond interviews and focus groups. Therefore, a broader review of individuals' values and buying patterns was reviewed through bivariate analysis between place-based communities, as well as income, education, and career to understand similarities and differences. It was identified that social, cultural, and natural capitals were the most prominent mentioned as assets in community, and environment and education were among the top values of individuals in communities. All communities except Iowa had environment ranking as one of the top two values, Marshall County, Iowa viewed environment as one of its lowest values, ranking 11th in importance. A significant finding from this chapter was the presence of cognitive dissonance or disconnect between perceived value of local food and farm businesses and the action to purchase local products (Ong, Frewer, & Chan, 2017).

The fourth chapter addresses organizations, and specifically Land-Grant University Extension (LGUE), engagement and usefulness within community food systems and the role they may play in developing more resilient community food systems in the future. To create resilience, diverse and collective collaboration across areas of planning, preparing, and responding is necessary. This chapter details several different types of organizations that may be useful in developing RCFS, based on a mixed-methods research study with five case-study communities across the nation. Overall, the chapter describes many different organizations that may be useful in developing RCFS, whether through preparedness, response, or recovery. While there has been research regarding general practices of disaster response for communities, this

research looked specifically at the role of LGU-E. The chapter also addresses the strength of relationships LGU-E has with community actors of RCFS and displays the lack of trust that LGU-E has within several communities and the potential reasoning behind those issues. The questions addressed in the chapter include:

- How are LGU-E engaged in RCFS?
- Do LGU-E services increase the ability for a community to establish RCFS? If so, how?

It was identified that LGUE need to incorporate more transdisciplinary programming and community projects that respond to the systemic needs of communities (Copeland, 2022; Kopp, 2021). The primary argument of the chapter is that LGU-E can improve capacity for RCFS through technical assistance and community capacity support, however, this is only the case if trust can be developed between community actor's and LGU-E. The chapter suggests that LGU-E must increase their trust, relevance, and collaboration within communities, by listening and actively responding to community needs (Copeland, 2022). It was also identified that communities are looking for strategic development and facilitation support. As trust is re-established, then LGU-E may be well suited to be one of the organizations that can provide this strategic facilitation and planning for resilient community food systems, including utilizing the framework developed in Chapter 2 for assessment, facilitation, and implementation around resilient community food systems. However, it should be noted that LGU-E is not the only organization that can support in this way, and in many cases, they may not be the trusted partner, or an agency that has capacity to support through facilitation and strategic planning. It will be important for LGU-E and organizations across the community to work together to identify roles and strategies for collaboration to foster resilient community food systems.

Contribution

The importance and contribution of this study is to add to the literature that currently exists around resilient community food systems planning, the understanding of impacts of natural and manmade disasters on community food systems, including strategies for Land Grant Universities to support this work. While the study of resilience has been on-going, the specific lens of food systems and understanding impacts of both types of disasters is only recently being considered. There is little research on resilience of community food systems within the United States, as much research has been conducted in developing countries (Himanen, Rikkonen, & Kahiluoto, *CFodesigning a resilient food system*, 2016). The primary data shared in this dissertation may be beneficial as communities seek planning strategies for the future. This research fills a gap in understanding of the direct impacts of disasters on community food systems, particularly areas of the supply chain, and identifies key actors and potential changes for the future.

Of particular interest is the development of a new conceptual framework that ties together community development processes that assess impacts from both manmade and natural disasters, the connection of community actors and organizations, and the possible strategies for LGU-E within this work. Figure 1-3 is an evolved conceptual framework from this initial framework shown in the methods section based on the primary research.

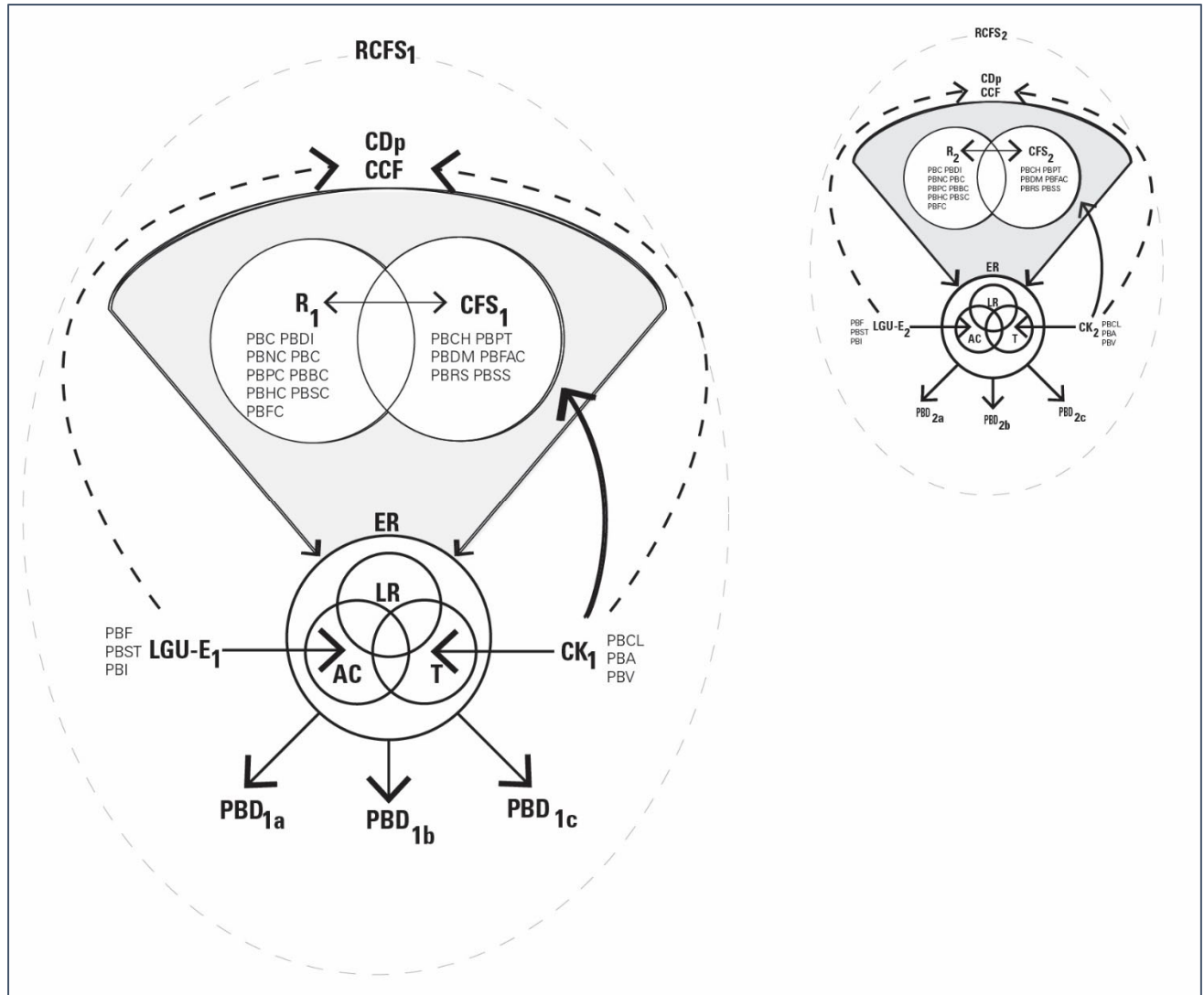


Figure 1-3: Revised Resilient Community Food Systems Conceptual Framework

This framework highlights additional aspects and specifics that are relevant to assessing and developing increased resilience for a community food system. A legend for terms is provided in Table 1-8.

Table 1-8: Resilient Community Food System Legend

Primary Themes	Indicators
Resilient Community Food Systems (RCFS)	
Community Development Processes (CDp)	
Community Capitals Framework (CCF)	
Evaluation of Resilience (ER)	Level of Resilience (LR) Adaptive Capacity (AC) Transformation (T)
Community Food Systems (CFS)	Cultivation and Harvesting (CH) Processing and Transformation (PT) Distribution and Marketing (DM) Food Access and Consumption (FAC) Resource Stewardship (RS) Scale (SS)
Resilience (R)	Climate (C) Disaster Impact (DI) Natural Capital (NC) Cultural Capital (CC) Built Capital (BC) Political Capital (PC) Financial Capital (FC) Social Capital (SC) Human Capital (HC)
Land Grant university Extension (LGU-E)	Funding (F) Staff (ST) Interest (I)
Community Knowledge (CK)	Awareness (A) Customer loyalty (CL) Values (V)
Place-based development opportunities (PBD)	Opportunity 1 (1a) Opportunity 2 (2a) Opportunity 3 (3a)

First, the overall circle on the left showcases a place-based resilient community food system (RCFS). Within this system, Community Development processes (CDp) with understanding of Community Capitals Framework (CCF) can be utilized to assess, determine, and plan resilient community food systems (RCFS). Specifically, these processes can assess the Resilience (R) and the Community Food Systems (CFS). After assessing these conditions, additional information will be needed to evaluate resilience (ER) and recovery practices, specific to level of existing resilience to shocks and stressors (LR), adaptive capacity (AC), and the need for transformation (T). To do this, understanding Land Grant University capacity (LGU-E) and Community Knowledge (CK) can be helpful. Finally, from utilizing the CDp, identification of

place-based development (PBD) practices can be determined. Additionally, indicators within each of these concepts have been added (See Table 1-9).

Table 1-9: Place-Based Indicators within Primary Categories of Conceptual Framework

Community Food Systems (CFS)	Community Actors Knowledge, Awareness, and Interest (CK)	Resilience (R) and Community Capitals Framework (CCF)	LGU-E
Cultivation and Harvesting (CH) May include Production type- (livestock, forestry, specialty crops, dairy, etc.); Scale of community food system (local/ regional/ national/ international (export))	Awareness (A): May include consumer, retailer, and wholesale business awareness of community food system products; awareness of resilience, planning and response	Climate (C): Predictability of systems impacts (foresight, predictability, climate patters, and records of past events)	Funding (F): Federal, state and local financial support for general extension programming and food systems involvement; Financial sand business structure of place-based LGU-E
Processing and Transformation (PT) May include Infrastructure (built infrastructure, storage, structures), number of processors	Customer loyalty (CL) May include sense of loyalty/ perception/ sales	Disaster Impact (DI) exposure to disaster and extreme events, frequency of impact, strength, and duration of disaster	Staff (ST): Number of staff dedicated to food systems, community development and resilience efforts; Time and dedication of staff members (i.e., full-time staff/ part-time/ etc.)
Distribution and Marketing (DM) May include Infrastructure (built infrastructure, storage, structures), proximity to primary retail markets, number of distributors	Values (V): personal and community values that relate to the interest in supporting or participating in community food systems	Natural Capital (NC) Ecological and systems boundaries, land-use, environmental protection, production practices	Interest (I): General interest from administration and staff for RCFS; Attitude towards participation within food system/ networks/ community)
Food Access and Consumption (FAC): may include Markets (demand/ distance to external markets/ imports); number of food retailers and interest		Cultural Capital (CC) historical knowledge, different cultures, diversity, acceptance, interest and general care for one another	
Resource Stewardship (RM): may include activities for conservation, stewardship, care for the land; number of organizations supporting with food donation programs, etc.		Built Capital (BC) number of producers/ processors/ distributors/ retailers; transportation systems; quality of built environment	

Table 1-9 Continued

Community Food Systems (CFS)	Community Actors Knowledge, Awareness, and Interest (CK)	Resilience (R) and Community Capitals Framework (CCF)	LGU-E
Scale (S): may include Size of food system (where begins and ends- geography, values that determine community food system (local/ regional), proximity to primary retail markets)		Political Capital (PC) regulatory framework, rules, and values; governance, appropriate and supportive policies, elected officials' interest	
		Financial Capital (FC): Economic development, GDP, Standards of living, economic health	
		Social Capital (SC) number of networks/ regional groups/ strength of relationships; Norms, trust, closeness of community, shared norms, bridging and bonding capital	
		Human Capital (HC) Demographic trends (population growth, trends); formal and informal leadership, education levels, attitude	

Community Food Systems (CFS) and Resilience (R) are intertwined and support each other in their unique, place-based features such as geography, necessity, population, and climate leading to a resilient community food system (RCFS). The conceptual framework suggests that when resilience is assessed by community capitals in relation to community food system components, communities can identify the level of resilience (LR), adaptive capacity (AC) and potential need for transformation (T), which in turn, supports further resilience for their community food system. To fully assess and determine the needs for a RCFS, community knowledge, awareness, and interest (CK) must be taken into consideration, along with key identification of place-based indicators that revolve around variables that encompass specific

food system sectors, organizational capacity, community capitals, and disaster impact. Thus, if each are working together, RCFS can be achieved and may develop new place-based development options (indicated in figure 3 as PB1a, BP1b, etc.).

The conceptual framework suggests that through the process of CDp with CCF, this process and assessment framework can be universally applied in place-based communities to develop RCFS and create specific place-based development (PBD) projects. Transferability is shown through the numeric signs ‘1’ in the primary visual and leading to a second conceptual framework with numeral ‘2’ as an indication that this is a transferable assessment process that can be utilized within multiple communities. Similarly PBD “a,b,c” refers to unique place-based aspects that are developed per place-based community. Note, that this is not suggested to say that there is a blueprint strategy that can be applied to all communities, rather, that there are replicable processes that can be utilized to assess and understand place-based practices and opportunities for the creation of RCFS.

Each of these areas hold potential for further investigation, whether through full operationalization of the conceptual framework of RCFS, testing new strategies for consumer engagement through a values lens, or incorporating LGUE specific practices for building trust and facilitation support. If enacted, this could lead to improved collaboration, trust, and partnership for LGU-E offices with new areas of the community.

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CHAPTER 2. RESILIENCE, ADAPTIVE CAPACITY AND TRANSFORMATION: A REVIEW OF FIVE CASE STUDIES TO ASSESS PLACE-BASED QUALITIES OF COMMUNITY FOOD SYSTEMS AND THEIR STATE OF RESILIENCE

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Abstract

Resilience planning, including the ability to prepare, respond, and recover is of the utmost importance in this era of increased incidence of disasters (Smith, 2022; Nelson, Zak, Davine, & Pau, 2016). Both natural and human made disasters impact individuals, families, and communities nationwide, and range in impact from loss of life and financial burden to food access constraints and loss of employment (Smith, 2022). This research assesses impacts from natural disasters and COVID-19 on five place-based community food systems, including identifying common characteristics for resilience. To do this, the chapter explores dimensions of community food systems, community capitals, and resilience through a review of place-based qualities identified in five case studies on the impact of natural disasters and COVID-19. The central hypothesis for this research included three primary components for resilience: first, sound infrastructure and buffering capacity to withstand shocks throughout the food supply chain was essential, second, leadership and social capital within the community provided necessary support for planning and responding to a shock, and third, political support for returning to equilibrium was necessary. The research found that while all community capitals benefit resilience, natural, built, and social capitals were the most frequently discussed as pillars for resilience, including

² This chapter is currently a work in progress. It may differ in significant ways from the published version.

the ability to respond and recover following a shock. Social capital related to adaptive capacity and the ability for groups or networks to respond and act immediately. Social capital in this context included the need for strong, trusting relationships internal and external to the disaster site, and historical knowledge and respect for the community, or cultural capital. Built capital included sound infrastructure, transportation routes and logistics planning, and proper equipment, storage and building infrastructure for farm and food businesses. Built and natural capital frequently overlapped because of the complexity of planning systems, as well as political capital, for ensuring natural assets and native ecological systems remained in place. Protection of natural systems included preservation of waterways and land and supporting opportunities for diverse production practices. To conclude, this chapter reviews a potential conceptual framework to assess the level of resilience for community food systems, highlighting the intersectional aspects of adaptive capacity, community capitals, and community food systems, with the goal that the framework can provide a future tool for communities to plan and strategize for response, efforts for recovery, and potential needs for transformation.

Introduction

There is evolving interest for developing resilient community food systems, specific to readiness, response, and recovery from shocks (Nelson, Zak, Davine, & Pau, 2016). However, to determine best processes, there is a need to further understand the elements of resilience as it relates to community food systems and the common traits that areas have that respond well to natural or human made disaster and shocks (Nelson, Zak, Davine, & Pau, 2016). Resilience is a critical consideration due to evolving concerns around ecological shifts, increase in disasters, rural population decline, and supporting future generations (Fainstein, 2014; Lin & Chang, 2013; Nelson, Zak, Davine, & Pau, 2016).

Numerous studies have been conducted on local food system impact and community development (Abate, 2008; DeLind, 2011; Christensen & Phillips, 2016; Feenstra, 2002). While climate change and food systems have been researched regularly, areas of vulnerability to a shock, resilience and recovery after a shock have been less frequently explored (Freitag, Abramson, Chalana, & Dixon, 2015; Schipanski, et al., 2016). Additionally, most of the research is around agriculture and environmental capacity, rather than alternative methods or the intersectionality of food systems, such as distribution, consumption, and resources (Nelson, Zak, Davine, & Pau, 2016; Himanen, Rikkinen, & Kahiluoto, Codesigning a resilient food system, 2016). Frameworks are needed to understand existing needs of communities as it relates to their ability to increase resilience (Harris & Spiegel, 2019; Himanen et al., 2016; Schipanski et al., 2016). A one-size fits all model that supports different geographies, climates, and unique community constraints such as population changes, demographics, or leadership and policy is not possible; therefore, a process or iterative framework is necessary to support communities in this effort (Sullivan-Taylor & Branicki, 2011).

This paper will describe the findings and common traits that provided increased resilience for community food systems across five community case studies that assessed natural disasters and COVID-19. First, a review of literature related to community development, adaptive capacity and community food systems will be detailed to identify interconnections. Following, we will provide a new definition for resilient community food systems. Then methods, analysis, and results will be discussed to explain key indicators for resilient food system. The chapter will conclude with a proposed framework for assessing a community food system level of resilience, adaptive capacity, or need for transformation.

Food System Concepts, Community Capitals, and Resilience

To review concepts of food systems, community capitals and resilience, an initial literature review was conducted from peer-reviewed articles, online publications, source interviews, and various books and publications. Content was cross-compared and clustered to organize themes that informed interviews, focus groups, and survey questions. The literature review also supported the generation of an elaborated resilient community food system definition.

Connecting community capitals, resilience frameworks and food systems

Climate change and the increase of natural disasters and environmental disturbances have caused increased stress on communities and food systems across the world (Nelson, Zak, Davine, & Pau, 2016; Olshansky, Hopkins, & Johnson, 2012). Decreased production yields, inability to distribute food products, business closures, and inability to access food have been common indicators of stress on the food system due to natural disasters (Freitag, Abramson, Chalana, & Dixon, 2015; Schipanski, et al., 2016; Walker, et al., 2006). Natural disasters like hurricanes, tornadoes, and fires, and climactic events such as temporal droughts, increased rainfall, etc., can cause damage to properties, decreased crop yields, and inability to distribute product. In addition to environmental disasters, COVID-19 has impacted the food value-chain in countless ways, from closing workplaces, educational institutions, and social gathering, to impacting labor and ability to work, bottlenecking supply and distribution channels, and changing consumer buying patterns, and lost revenue (Aday & Aday, 2020; Edmondson, et al., 20; Griffin, Hotvedt, & Parker, 2021).

With the increased number of disasters, global pandemic, and time-compression (“the phenomenon of increased intensity of activities in a period of time”) (Olshansky, Hopkins, & Johnson, 2012, p. 174), disaster fatigue and stress have increased for individuals, households and

communities, leading to a delayed response and ability to recover (Lowe, et al., 2019; Olshansky, Hopkins, & Johnson, 2012). Depending on the severity and length of the impact, the ability to return to equilibrium may take longer (Olshansky, Hopkins, & Johnson, 2012), additionally, communities may find that they do not have an equilibrium and need to transform into something new (Walker, et al., 2006). Due to these conditions, resilience has become one of the most important research topics and one of the most challenging, as definitions have continued to evolve and become diluted (Brand & Jax, 2007).

Resilience can relate to communities, landscapes, and organizations and thus has become both a social-ecological concept as well as a boundary and evaluative concept (Brand & Jax, 2007). Resilience, within the extended ecological framework, seeks to understand key propositions of cross-scale interactions and ecological and social domains (Brand and Jax, 2007; Walker, et al., 2006). Resilience can be viewed as “the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity” (Walker et al. 2006, pg. 2). After a community goes through a shock, there are short, intermediate, and long-term recovery processes that occur. To understand how to cope and react best to a disaster, whether sudden shock, intermittent, or gradual, there is a need to understand both pre- and post- resilience strategies to aptly respond, recover, rebuild, and “re-birth” as a community (McCarthy & Wolnik, 2019).

Schipanski et al. defines food systems resilience as “the capacity of food systems, including the actors within them (e.g., individuals, communities, farmers and consumers), to cope with interacting and cumulative forces that undermine food access and equity” (Schipanski, et al., 2016, p. 600). Food systems connect across local and global scales and may have different areas of participation and possibilities from policy creation, nutrition, and food security, locally

grown, sustainably raised, democratic participation, and community and economic development, and place-making (Feenstra, 2002; Christensen & Phillips, 2016). Due to their systemic nature, food systems also impact organizations, businesses, and individuals across sectors both directly and indirectly (Ruhf, et al., 2017; Schipanski, et al., 2016). Because the food system contains not only agricultural conditions, but also processing, distribution, and means to find consumable products for consumers, multiple considerations need to be considered to determine the best method for preparing, responding, and recovering from a shock or disaster.

While there is agreed concern on the need to address resilience, there are gaps in literature on resilience for food systems, especially for place-based communities. COVID-19 brought to light new research in respect to local food systems³, but research related to food systems and natural disasters is limited. Much of the research that has been conducted is related to the global and industrialized food system, rather than local and community scaled approaches (Schipanski, et al., 2016; Himanen, Rikkonen, & Kahiluoto, 2016; Bass & Dalal-Clayton, 1995; Hebinck, Vervoort, Hebinck, Rutting, & Galli, 2018). Climate change impacts on the food system have been reviewed, however there is additional research needed to understand interdisciplinary approaches and systems impacts (Nelson, Zak, Davine, & Pau, 2016; Schipanski, et al., 2016). Ballamingie's article on urban food systems investigated appropriate policies for small and mid-sized cities, and call out the need for adaptation and proactive planning for resilience (Ballamingie, et al., 2019). This speaks to the need for small and mid-sized cities to understand their locale through a food systems lens and plan for the future through cross-cutting agendas around health, environmental stewardship, and food production (Ballamingie, et al., 2019).

³ for example, a new platform in Local Food Economics, focuses on research for COVID-19 response in local food systems, with countless resources and articles about best practices for response and impact (USDA Agricultural Marketing Service, Colorado State University, University of Kentucky, University of Maine, 2023),

To assess vulnerabilities, assessment tools exist, such as FEMA's and NOAA's indexes and mapping that assess vulnerabilities, risks, and existing levels of resilience (FEMA, 2023; National Centers for Environmental Information: National Oceanic and Atmospheric Administration, 2023). However, due to the intersectionality with community food systems, and desire to have individuals play a part in co-creating their food system and increased resilience, additional measures are needed to assess resilience. To do this, communities need to understand how community actors (individuals, organizations, businesses, amenities, etc.) interact with each other. Additionally, there needs to be investigation on how community actors can assist in the development of community capitals that can enhance resilience (Emery and Flora, 2006; Prabhakar et al., 2014; Ruhf et al., 2017). According to Wilkinson's generalizing structure, "communities form linkages between individuals, organizations and agencies to integrate, coordinate, reinforce and mobilize common elements of their differentiated special interests for the community's welfare" (Brennan, Frumento, Bridger, & Alter, 2013). The following section of the paper details the intersections of the Community Capitals framework, community food systems, and resilience as a proposed conceptual framework for assessing resilience for the future of food.

Dissecting each component, a review of Food System Concepts, Community Capitals, and Resilience

"Local" has become a topic amongst individuals, organizations, and institutions to revitalize and develop their place-based community. As many economies have continued to grow into the global spectrum, food systems have as well, moving into commodity and industrial systems to feed the world (Feenstra, 2002). A food system is considered "local" based on the flow of food from producer to end consumer within a specified area (Christensen & Phillips, 2016). This can include reference to different spatial units ranging from city or state boundaries

to several radial miles from a specific location (Thilmany McFadden, 2015). Because of the variability, local can be a challenging term. However, local is generally strongly attached to a locale and incorporates opportunities for place-based producers and buyers to connect and in turn build economic regeneration for that locale (Thilmany McFadden, 2015).

Regional is another geographic analysis of a food system, while referring still to a specific locale, it incorporates a broader regional geography. Regional food systems still connect to economic growth and sales within a locale but are more broadly defined by the food-shed and distribution area (Horst & Gaolach, 2014). Food-shed is used to understand the area that food moves from producer to consumer (Horst & Gaolach, 2014).

There are subtle, but important differences between local and regional frames of reference. Community Food Systems (CFS) have recently become more heavily researched topic. For example, many local actors see their purchases and sales as more than just means to the locally based strategy, they also contribute to local culture, social connections and sense of pride and self-sufficiency (Dixon, 2011). Like local and regional food systems, CFS are place-based systems, but are determined in scale by its constituents, and therefore may be narrow or regional in scope. CFS typically have engagement from various sectors of the food system from production, processing, distribution, consumption, and resource management (Long, 2017), and are derived from a community process that assists in utilizing community knowledge to inform decisions about food systems creation (Feenstra, 2002). The goals of CFS are to create a system, process, and infrastructure, in which food travels, including production, processing, distribution and marketing, consumption, and resource management while also contributing to essential community assets of policy, equity, economy, wellness, environmental stewardship, built infrastructure, and education (Feenstra, 2002; Campbell, 2004; Long, 2017). CFS are based on

the options for community participation (Dixon, 2011) and engagement and connections to the community. This includes a collective approach for developing a systemic vision for the CFS and then determining priority areas of development which may include: accessing job opportunities in farm and food businesses as well as offer fair compensation (Feenstra, 2002); creating policies for food access, civic agriculture, and environmental considerations (Christensen & Phillips, 2016); promoting education on the dynamics in our food systems, ways to engage, and ways to grow, create and re-use our resources; and increasing access to foods for healthy individuals and communities while also creating healthy place-based environments (Christensen & Phillips, 2016; Feenstra, 2002). To highlight the variances across scales of food systems, Table 2-1 was created.

Table 2-1: Comparison of Food Systems Scales: audience, goals, strengths, and weaknesses

	Audience	Goals and Objectives	Strengths	Weaknesses
Food Systems	Everyone	Feed the world; multi-faceted and multi-scalar; variety of foods and low-cost accessibility (Mount, 2012); profit maximization and standardization (Campbell, 2004)	Conventional; Large in scale and includes multiple inputs and outputs; (Mount, 2012)	Food safety, nutritional value, environmental impacts; Impacts on family farms (Christensen & Phillips, 2016); Large and connections to our food system become unclear (Peters, 1997)
Local Food System	Producers; Processors; Distributors; Retailers and Wholesalers; Consumers (locavores).	Local, Place Based economic development and environmental sustainability (Feenstra, 2002); Support small-medium sized food-based agriculture (Mount, 2012); Shortened food chains.	Shared goals for food system development, (Mount, 2012); Emphasis on social connections: farmer and consumer; build up small to mid-size family farms	Elitist: locavore can be viewed as elitist- income to spend more on their food budget (DeLind, 2011); Determination of the appropriate scale for agriculture and value-chain to be effective (Mount, 2012); Time intensive
Regional Food Systems	Producers; Processors; Distributors; Retailers and Wholesalers; Consumers (locavores).	Place-based; diverse; smaller than the national scale, but not limited to community	“Support sufficient, diverse, affordable and resilient food system” (Palmer, et al., 2017)	Gap in understanding benefits and need of region systems; geographical and political barriers

Table 2-1 Continued

	Audience	Goals and Objectives	Strengths	Weaknesses
Community Food System	Producers; Processors; Distributors; Retailers and Wholesale Buyers; Consumers; Resource Management	Food justice and food access; Community based development and Collective Action; Incorporation of civic and social space; Promotion of food value-chains; Job creation; Improved community living conditions; Food and Agriculture policies; Education and awareness of the existing conditions of the food system (Feenstra, 2002)	Community Food Security: Opportunity for all individuals to have access to healthy, safe food; Creative strategies and increased engagement; Civic agriculture seen as part of local communities; Education of the various policies, constraints, and opportunities within all scales of food systems (Feenstra, 2002)	Broad Time intensive Relationship and values-based Systems, and production methods, may not always be economically sustainable and rely on government assistance, etc. (grants, food-assistance, etc.)

Community food systems as a concept will be utilized for this study to understand the breadth and intersections across the community. We operationalize community food system by looking at different sectors (Table 2-2).

Table 2-2: Food System Sector definition

<i>Food System Sectors</i>	<i>Definition</i>
<i>Cultivation and Harvesting</i>	science, art, or occupation of cultivating land, raising livestock, hunting, fishing, foraging or farming
<i>Processing and Transformation</i>	transformation of raw ingredients, physically or chemically, into a value-added product
<i>Distribution and Marketing</i>	moving product from initial location or processing site to market or consumer
<i>Food Access and Consumption</i>	Family and individual access to food in a physically safe, financially viable, and culturally competent way
<i>Resource Stewardship</i>	Care and stewardship of natural resources, such as air, land, water, soil, plants, foods and created materials

Source: Adapted from the Iowa State University Community Food Systems Program (Long, 2017)

Community Development Processes and Community Capitals Framework

Due to the intersectionality within community food systems, and the desire to have individuals play a part in co-creating their food system, understanding how community actors (individuals, organizations, businesses, amenities, etc.) interact with each other can assist in the development of needed community assets (Emery and Flora, 2006; Prabhakar et al., 2014; Ruhf et al., 2017). Community development frameworks are utilized to help revitalize and enhance

communities place-based assets and opportunities. Processes to assist in community development involve facilitation, visioning, and capacity development and tend to focus on resolving complicated systemic issues (Moomaw, 2016) that incorporate social, physical, and economic strategies (Sites, Chaskin, & Parks, 2007).

Of specific interest within this research was community economic development (CED), which works with residents who live and connect with one another and build a social fabric together (Korsching & Davidson, 2013). It can be seen as the merging of both the field of community development and economic development and can be used for community improvement in a place-based setting (Christensen & Phillips, 2016). Typically CED focusses on locally-owned businesses and organizations, while also promoting relationship development to foster social capital (Phillips, 2016); this may include: ensuring livable wages, developing ecologically sound building practices, building bridging and bonding social capital, and increasing the quality of life for individuals in the community (Christensen & Phillips, 2016; Hughes & Boys, 2015). A concern with community economic development is the lack of shared measurements and evaluation metrics (Booth & Fortis, 1987), however, there are opportunities through CED processes to develop place-based metrics and evaluations that are particular to the community locale. These methods of place-based evaluation and determining local, community-based, values lead to success measures, that can generate additional accountability to community members that are participating in the process (Flora, 2017). Due to the versatile scale and nature of CED, this research will utilize a CED lens to assess and discuss community economies in regards to community food systems. This presumes that there are values instilled in each place, that is community defined, that connects individuals to one another and to the assets in the area,

leading to intentional development of place-based community resources (Feenstra, 2002; Dixon, 2011).

Within the community economic development lens, understanding how community actors (individuals, organizations, businesses, amenities, etc.) interact with each other can assist in the development of needed community assets (Emery and Flora, 2006; Prabhakar et al., 2014; Ruhf et al., 2017). Different processes are used to bring together actors within a system to assess, focus, and determine appropriate next steps for intersectional and transformative discussions (Marshall, 2015; Partelow, 2018). Examples include Collective Action theory, Community Capitals Framework, and Social-Ecological Systems Framework, which can support cross-discipline and transformative discussions through multi-tiered understanding of the community (Marshall, 2015; Partelow, 2018). Adaptive Decision-Making frameworks help understand adaptive capacity in response to disaster or disaster management (Prabhakar, Wright, & Tsurita, 2014) and the National Sustainable Development Strategy which includes economic and ecological understanding of the community in an effort for resiliency (Bass & Dalal-Clayton, 1995).

A more nuanced form of this interaction of food systems is understanding the connection to the broader community. The community capitals framework utilizes seven capitals, built, natural, cultural, financial, social, human, and political to understand the pieces of a whole within a community. The Community Capitals Framework can be used to help communities understand the whole of their community based on capitals, or assets. Community Food systems have a systemic nature that directly and indirectly impact community capitals as well as organizations, businesses, and individuals across the community (Ruhf, et al., 2017; Schipanski, et al., 2016). There are many intersections of food systems and the broader community ranging

from food access, ecological processes, infrastructure including transportation, social justice, and waste reduction (Long, 2012; Winne, 2008; Schipanski, et al., 2016). Equitable employment opportunities both for access to workforce development (Hughes & Boys, 2015) and fair wages that allow individuals and families to adequately support themselves are also inherent to food systems work (Winne, 2008).

Table 2-3 was developed to operationalize the connection between community food systems and relationship with community capitals. This table distinguishes baseline examples of the intersection between each capital and food system components based on findings from each case study.

Table 2-3: Community Capitals and Community Food System Intersections

	Description of capital	Cultivation and Harvesting	Processing and Transformation	Distribution and Marketing	Food Access and Consumption	Resource Stewardship
<i>Natural Capital</i>	Landscape, climate, air, water, soil and biodiversity	Climate impact on production practices; water accessibility	Access to water for proper safe handling practices	Impact of environment and natural conditions on shipping and distribution	Walkability, access to culturally appropriate gathering of food	Quality of water, land resources and availability, quality of air
<i>Cultural Capital</i>	Values and approaches to life, history and heritage, a lens in which individuals view the world	Opportunities for producing, harvesting, gathering culturally relevant food	Ability to process religious, spiritual, or other appropriate processed foods	Bilingual communication across marketing and signage	Exposure to diverse and culturally significant foods	Traditional food ways, care for the environment, animals, and land
<i>Human Capital</i>	Skills and abilities of each individual	Beginning farmer programs and knowledge of production practices	Knowledgeable labor force for processing plants, kitchens, etc.	Skilled labor and fair-paying jobs for aggregators and distributors	Knowledge of food preparation and food handling skills	Understanding of environmental stewardship practices
<i>Social Capital</i>	Networks, relationships, and trust developed between individuals, groups, and communities	Networks for beginning farmers	Shared kitchen and community centers	Food hub networks and learning circles	Social events and dialogue around food	Gleaning programs and networks for food rescue

Table 2-3 Continued

	Description of capital	Cultivation and Harvesting	Processing and Transformation	Distribution and Marketing	Food Access and Consumption	Resource Stewardship
<i>Political Capital</i>	Power and influence; ability to create standards, laws and practices for organizations or larger civic society	Land access policies and funding for farming	On-farm licenses for slaughter and processing	Increased governmental support for building local food markets	Supplemental Nutrition Programs	Resource and Conservation districts, land preservation
<i>Financial Capital</i>	Money, capital, or other valuable community	Business and record keeping skills	Capital Investment and Loans	Grant Programs for new food distribution	Fair wages and understanding of methods to extend your dollar	Land Trusts and organizations securing funding for care of the natural environment
<i>Built Capital</i>	Infrastructure across the community such as roads, buildings, and constructed projects	Equipment and infrastructure for production	Appropriate building infrastructure, facilities, and equipment	Safe and accessible roadways, building infrastructure (ex. Loading docks, equipment, and storage)	Safe sidewalks and modes of transportation	Coordination with the stewardship of the natural environment; irrigation systems, hoop houses, etc.

Source: Based on Community Capitals Framework (Flora & Flora, *Rural Communities*, 2008, pp. 17-18)

Resilience

Resilience has become one of the most important research topics and one of the most challenging to define, as definitions have continued to evolve and become diluted (Brand & Jax, 2007). Resilience can relate to communities, landscapes, and organizations and thus has become both a social-ecological concept as well as a boundary and evaluative concept (Brand & Jax, 2007). In this research, resilience is operationalized through the ecological framework, which cuts across scales, interactions, ecology, and social domains (Brand and Jax 2007; Walker, et al., 2006). Resilience is “the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity” (Walker et al. 2006, pg. 2).

Disasters are typically understood by either being natural or manmade (Zibulewsky, 2001). Depending on community vulnerabilities due to disasters, which can include sudden shocks (e.g., catastrophic weather events), intermittent shocks (e.g., price volatility), and gradual pressures (e.g., climate change and shifting human diets), individuals and communities can be impacted in different ways (Schipanski, et al., *Realizing Resilient Food Systems*, 2016). For example, a drought may not have a large impact on the community at large but can devastate an agricultural business due to crop failure and loss. Another example includes gradual pressures to individuals, such as experiencing multiple disasters back-to-back, known as disaster fatigue (Olshansky, Hopkins, & Johnson, 2012).

Vulnerability is the potential for harm to the community capitals (Committee on Increasing National Resilience to Hazards and Disasters and Committee on Science, Engineering, and Public Policy, 2012). Schipanski et al., defines food systems resilience as “the capacity of food systems, including the actors within them (e.g. individuals, communities, farmers and consumers), to cope with interacting and cumulative forces that undermine food access and equity” (Schipanski, et al., 2016, p. 600). For food systems this may include “immediate natural disasters such as hurricanes, which disrupt food production...and also may include long-term trends such as droughts or declining productivity” (Harris & Spiegel, 2019). There are vulnerabilities that are embedded based on economic, environmental, and other community connections that are unable to be managed (Harris & Spiegel, 2019). This vulnerability is a critical piece to understanding and evaluating the resilience opportunities for livelihoods and food systems (Lin & Chang, 2013). When working in these areas of resources, having the capacity to conduct assessments on vulnerabilities, whether power relations, social

connections, cultural relevance, or environmental conditions, all play a part in a resilient method for future livelihoods (Lin & Chang, 2013).

Therefore, understanding both the vulnerability of having a shock, and the impact a shock will create, is necessary to prepare, respond, and increase resilience (Himanen et al., 2016; Schipanski, et al., 2016; Vermeulen, Campbell, & Ingram, 2012;). To understand how to cope and react appropriately to a disaster, there is a need to understand both pre- and post- strategies to aptly respond, recover, rebuild, and transform as a community (McCarthy & Wolnik, 2019).

While resilience is the ability to absorb a shock, adaptability or adaptive capacity and transformation are other ways communities may respond. Adaptability refers to the way a community or group can manage resilience and self-organize (Walker, et al., 2006). Leadership capacity and networks can help with adaptive capacity and assist in response for a community (Brand & Jax, 2007; Engle, 2011). Adaptability is the ability of a system, and its community actors, to prepare for stresses in advance of an impact, or to be able to adjust to the effected of the stress (Engle, 2011). When adaptation doesn't occur, transformation may be necessary. Transformation occurs when a fundamentally new system is needed due to a shock (Walker, et al., 2006). This can happen even when a system is resilient to a natural disaster or ecological phenomenon, but the community is unable to adapt to the impact (Schipanski, et al., 2016; Walker, et al., 2006). Transformation can also be needed when social constraints, such as policies or government do not assist in adaptation, and a new paradigm is necessary (Walker, et al., 2006). To showcase the intersection of community food systems, and aspects of resilience, Table 2-4 was created.

Table 2-4: Comparison of vulnerabilities, resilience, adaptive capacity, and transformation

Concept	Definition	Community Actors	Community Capitals	Food Systems
Vulnerability-varying characteristics impacting the potential for disaster	Vulnerability is the potential for harm to the community capitals (Committee on Increasing National Resilience to Hazards and Disasters and Committee on Science, Engineering, and Public Policy, 2012)	Disaster fatigue and stress have increased for individuals, households and communities, leading to a delayed response and ability to recover (Lowe, et al., 2019; Olshansky, Hopkins, & Johnson, 2012)	Catastrophic weather events, intermittent shocks (e.g., price volatility), and gradual pressures (e.g., climate change and shifting human diets) (Schipanski, et al., 2016)	Decreased production yields, inability to distribute food products, business closures, and lack of ability to access food (Freitag, Abramson, Chalana, & Dixon, 2015; Schipanski, et al., Realizing Resilient Food Systems, 2016; Walker, et al., 2006).
Resilience-level of ability to respond and withstand an impact	Resilience is operationalized through the ecological framework, which cuts across scales, interactions, ecology, and social domains (Brand and Jax 2007; Walker, et al., 2006). Resilience is “the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity” (Walker et al. 2006).	Extent of individuals, or groups, ability to withstand a disaster or event; including trust, diversity, relationships and networks (Walker et. al 2006).	An aspect of resilience and ability to respond, is the scope of impact from a disaster (Committee on Increasing National Resilience to Hazards and Disasters and Committee on Science, Engineering, and Public Policy, 2012); need for response diversity across capitals and ecosystems (Walker et. al., 2006)	Ability to withstand shocks and disruptive pressures while maintaining basic structures, processes and functions of and within the community food system and supply chain, ensuring the ability to produce and access nutritious and culturally acceptable food over time and space, and creating a new normality (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020).
Adaptive Capacity – ability to respond and manage	Adaptability refers to the way a community or group can manage resilience and the “self-organization without system-level intent or centralized control” (Walker, et al., 2006)	Ability to self-organize and increasing equitable engagement in planning practices and response (Schipanski, et. al. 2020); adaptability of a group is largely based on the function of an individual (Walker et. al. 2006)	Leadership capacity and networks can help with adaptive capacity and assist in response for a community (Brand & Jax, 2007; Engle, 2011).	Adaptability is the ability of a system prepare for stresses in advance of an impact, or to be able to adjust to the effected of the stress (Engle, 2011)
Transformation – need to change current conditions to be resilient in the future	Transformation occurs when a fundamentally new system is needed due to a shock (Walker, et al., 2006). Transformation can also be needed when social constraints, such as policies or government do not assist in adaptation, and a new paradigm is necessary (Walker, et al., 2006).	Elevate Food and Nutrition Security to a Top Priority; 2 Align University Resources and Structures for Transdisciplinary Approaches; 3 Enhance and Build University-Community Partnerships; Educate a New Generation of Students to be Transdisciplinary Problem Solvers (Association of Public and Land Grant Universities)	Need to change regime or political structure; found in recognition of past failure due to policy/ resource management/ or social value crisis (Walker et. al. 2006)	Increasing productivity; scaling-up of agriculture (from small-scale production systems); technology advancement (Aday and Aday 2020); address equality issues, support agroecological production practices, develop regional food systems, and access to cultural and health foods (Schipanski et. al. 2020)

Methods

The methods for research included three interconnected, nonlinear approaches:

1. Mixed-method study through interviews, focus groups and surveys with five case study communities to assess natural disaster and COVID-19 impacts and resilient components.
2. Data analysis and coding of results.
3. Action-planning process to assess immediate next steps for communities in relation to developing a resilient food system and creating a transferable process.

This mixed-methods approach includes a light connection to grounded theory and incorporates an iterative process (Hesse-Biber, 2010) with appreciative inquiry interviews, participatory-based foresight focus groups (Patton et al., 2015; Hebinck et al., 2018; Himanen et al., 2016; Ruhf et al., 2017), followed by individual surveys to assess values and individual impact from natural disasters and COVID-19. Non-probability sampling through convenience and networks were used, including snow-ball interviews and network listservs for survey participation (Baker, et al., 2013). Data analysis was aimed to develop theory through an iterative process, leading to data acquisition guiding the next steps. This chapter received IRB Approval, IRB 20-471, in 12/23/2020 (see Appendix C).

Interviews, focus groups, and surveys

Five place-based case study communities were identified to participate in the study. They were determined based on previous collaboration, experience with food systems development work, and experiencing different types of natural disasters and COVID-19 (Table 2-14). In total 68 semi-structured interviews, 13 foresight focus groups, and 273 surveys were completed (Table 2-5) At the beginning of the research study, each community partner helped identify at least one natural disaster that was perceived to have the most impact on the community food system. However, in cases of Alaska, Texas, and Arkansas, additional natural disasters were

added to research methods because individuals spoke to different disasters that impacted their everyday life and community food system.

Table 2-5: Community Research Participation

COMMUNITY	NATURAL DISASTERS	RESEARCH PARTICIPATION
ALASKA: KENAI PENINSULA	Swan Lake Fire- 2019 Additional disasters added based on interviews: earthquake, flood, drought, ice, wind, drought)	<ul style="list-style-type: none"> • 35 survey responses; completion rate 1.5% • 2 focus groups (6 participants) • 7 interviews
ARKANSAS: BENTON AND WASHINGTON COUNTY	Strong winds and tornado- 2017; additional natural disasters added based on interviews: ice, hail, wind, flood, fire	<ul style="list-style-type: none"> • 109 survey responses; completion rate 16% • 1 focus group – 6 participants • 13 interviews
IOWA: MARSHALL COUNTY	Derecho- 2020 and Tornado -2018	<ul style="list-style-type: none"> • 35 survey responses; completion rate 5% • 2 focus groups – 6 participants • 19 interviews
TEXAS: BASTROP COUNTY	Lost Pines Fire – 2011; additional disasters added based on interviews: Winter Storm Uri, hail, drought, flood, tornado	<ul style="list-style-type: none"> • 76 survey responses, completion rate 18% • 5 focus groups- 12 participants • 17 interviews
US VIRGIN ISLANDS: TERRITORY	Hurricane Irma and Maria – 2017	<ul style="list-style-type: none"> • Two surveys: 18 survey respondents; completion rate 3.8% • 240 survey respondents; completion rate 100% • 3 focus groups – 17 participants • 12 interviews
TOTAL		<ul style="list-style-type: none"> • 68 interviews • 13 focus groups: 47 participants • 273 survey participants

Participants within qualitative research were chosen based on interest and involvement in food systems, and then asked about their community, food systems, response and recovery to natural disasters and COVID-19. Table 2-6 shows community actor types that participated in interviews and focus groups.

Table 2-6: Community Actor Interview Types reviewed by community food system sectors and community capitals

Community Food Systems	
Cultivation and Harvesting	Gardeners and homesteaders, farmers, fishers, hunters
Processing and Transformation	At home food processors, shared-use kitchen managers, value-added business creators, and processing facility managers
Distribution and Marketing	Community Supported Agriculture business owners; food box and food hub managers, farmers market managers, grocery store managers, school dining and nutrition directors, and food bank managers
Food Access and Consumption	Food pantry and meal program coordinators, college and hospital dining directors, state departments of public health and nutrition, restaurants and food truck owners, Food System Policy Councils and Coalitions

Table 2-6 Continued

Community Food Systems	
Resource Stewardship	Natural Resource and Conservation district personnel, Department of Natural Resource personnel, Land Trust coordinators; Fishery and Coastal Management coordinators, non-profit organizations working to reduce waste, and gleaning program coordinators
Community Capitals	
Natural Capital	Individuals listed in cultivation and harvesting and resource stewardship, Land-Grant University Campus Faculty & Staff working in areas of agriculture, FEMA staff,
Cultural Capital	Indigenous organization coordinators, Latinx community members, residents, community foundation staff, Land-Grant University Campus Faculty & Staff working in community
Human Capital	Residents, school and college administrators, employers
Social Capital	Residents, city council and elected officials, individuals involved in networks, coalitions and boards, Land-Grant University Campus Faculty & Staff working in community
Political Capital	Elected officials; city, county and state departments; University staff members; board members for non-profits
Financial Capital	Bank staff, economic development authority personnel, lending organization staff, business owners
Built Capital	All individuals within community food systems; City, county, and state departments;

This work was completed by a research team from Iowa State University Extension and Outreach Food Systems team. The primary investigator developed the interview and focus group guides and survey. Review of the research tools was conducted by two research team members as well as dissertation committee members. The research team also participated in interviews and focus groups and helped with note taking during each interview and focus group. Only the primary investigator coded and analyzed the data.

Participants were interviewed virtually, via zoom, and each interviewee was asked if there were additional individuals that should participate in the research via a snowball sampling method. As themes emerged, additional participants were sought out who had experience within specific themes. Additionally, interview participants were asked to participate in a foresight focus group process, which were held in person. While interview participants were asked to join focus groups, focus groups were also shared broadly with community actors. The focus group utilized a participatory foresight process to encourage collective thinking on “what-if” scenarios for future sudden and intermittent disasters. Following focus groups, additional coding was

conducted, and then an individual survey was developed and shared with community members to understand disaster impact and individual's values.

Analysis to Finalize Resilient Food Systems Framework

Based on the literature review discussed previously, we identified key areas of interest for this research and revealed primary frameworks that are useful within community development, resilience, and food systems. Through this discovery, three key frameworks and concepts emerged due to their interdisciplinary nature: community food systems, Community Capitals, and resilience framework. Figure 2-1 presents a conceptual framework for place-based community development (PBC) for resilient community food systems.

Community Economic Development (CED) with a flexible social-ecological systems (SES) and collective action theory, can be utilized to assess, determine, and plan resilient community food systems (RCFS) based on community knowledge (CK) and participation from

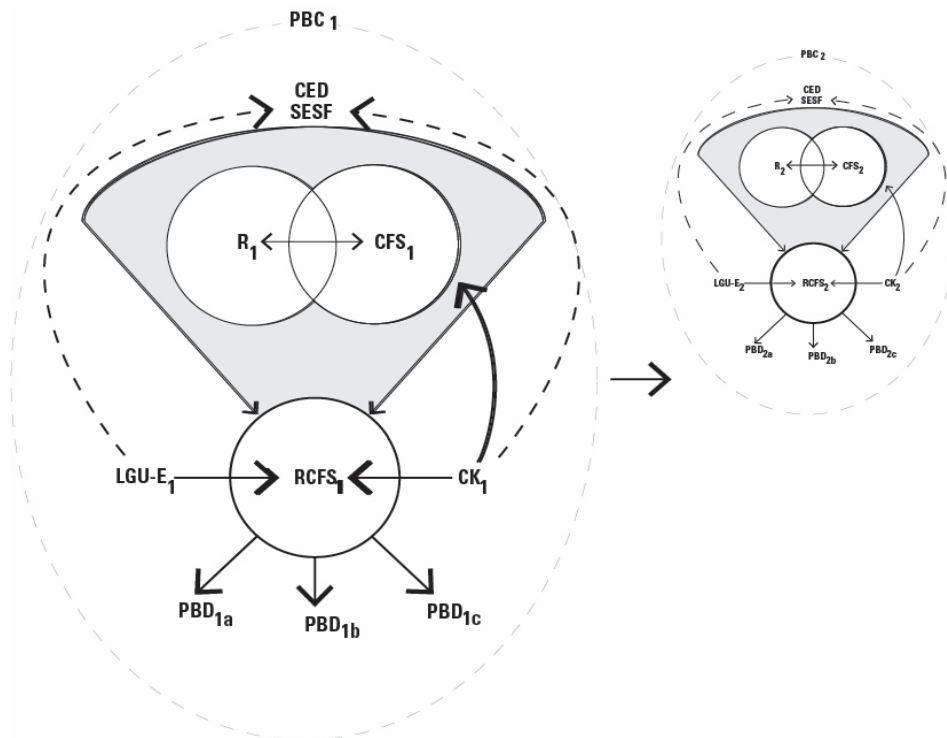


Figure 2-1: Initial Resilient Community Food Systems Conceptual Framework

Land Grant University Extension (LGU-E). Community Food Systems (CFS) and Resilience (R) are intertwined and support each other in their unique, place-based features such as geography, necessity, population, and climate leading to a resilient community food system (RCFS). To fully assess and determine the needs for a RCFS, (CK) and wisdom is necessary, along with key identification of place-based indicators (PB a, b, and c) of the community food system environment, that can be supported from LGU-E. Place-based indicators that will be utilized in addition to community knowledge and perceptions, is production (PBa), processing and distribution (PBb) and retail (PBc). The conceptual framework suggests that with a CED lens and SES framework, this research can develop a RCFS assessment process that can be universally applied for place-based communities, this is shown through the numeric signs '1' in the primary visual and leading to a second conceptual framework with numeral '2'.

To analyze similarities and differences in level of resilience for community food systems, transcripts from interviews, focus groups, and field notes were brought into NVivo for coding. Surveys were analyzed in Excel. Themes identified were classified into several sub-categories and then compared to key concepts identified in the literature review.

The mixed methods approach suggest that the integration of community capitals, resilience, and community food system components are integral to a community's ability to assess their level of resilience, adaptive capacity or need for transformation. Following analysis, each community was presented a snapshot of information and participated in facilitated action-planning sessions to determine priority areas to increase their resilience. Additionally, from the case study research, an evolved resilient community food systems framework was developed. Findings from natural disaster and COVID-19, as well as the evolved framework will be shared within the results section.

Results and Discussion

To further express the interconnections of the resilient community food system framework, we will dive into case study examples of impact from each case study. First, natural disaster impact will be discussed, followed by COVID-19. Each will detail specific case study findings and intersections between community capitals, community food systems and resilience. Then, we will compare across each case study and showcase the evolved framework.

Natural Disaster Impact

As mentioned, at the beginning of the research study, each community partner helped identify at least one natural disaster that was perceived to have the most impact on the community food system. However, in cases of Alaska, Texas, and Arkansas, additional natural disasters were added to research methods because individuals spoke to different disasters that impacted their everyday life and community food system. Within this chapter, not all disasters are discussed; the discussion focuses on the top two natural disasters that impacted the community based on number of residents who experienced the type of disaster from survey responses.

Alaska

The Kenai Peninsula has been involved in seven designated disasters since 2011 according to FEMA (FEMA, 2022). The research team identified the most recent Swan Lake Fire (2019) as the primary focus for the research because the fire caused health concerns, ecological damage, and ceased passage and distribution routes. However, during interviews, we heard of additional events like earthquakes, drought, and freezes that impacted the food system. Twenty-five survey participants (71%) shared that they experienced a natural disaster, which included the Swan Lake Fire, hail, flood, wind, tornado, and drought.

Alaska was unique in that they experience multiple types of disasters and have limited capacity for response due to their isolated geography. For example, within the survey, beyond the categories of natural disaster presented, individuals experienced snowstorms, volcanic eruptions, wet and cold summers, mud slides, other fires (beyond Swan Lake), avalanches, and heavy rains.

With the breadth of disaster, and the isolation occurring in Kenai Peninsula due to the city of Homer being at the end of the road, impact from natural disasters can cause additional havoc because people cannot access resources. Road infrastructure ends just miles to the west by Voznesenka, Alaska. Due to these limited resources, events such as earthquakes and fires can debilitate individuals from being able to leave town before a storm or get to grocery stores or other food aggregators that are in larger populated cities like Anchorage.

Arkansas

Benton and Washington Counties have been involved in six designated disasters since 2011 according to FEMA (2022). Like Alaska, the research team initially planned on assessing the strong winds and tornado in 2017 and 2019, but interviewees shared that events such as flooding, drought, and ice storms impacted their ability to farm, distribute food, and continue their work in the food system. Of the survey participants, 79 (72%), shared that they experienced a climactic event or disaster, which included hail, drought, flood, wind, tornado, ice, and fire. Of those participants, 64% experienced more than one climactic event. Arkansas research participants also reflected generally on climate changes that effected crop selection, particularly fruit and berries, stating that they were experiencing more freezes during the spring which damaged crops. We also heard about perceived increase in the number of natural disasters and production failure, and the frustration of small-scale farm businesses needing better access to crop insurance.

Iowa

Iowa focused on the disasters of the 2018 tornado and 2020 derecho. In 2018 there were 21 tornadoes that touched down across Iowa, with 19 in the central Iowa region alone (National Weather Service, 2018). The 2018 tornado that hit Marshalltown was an EF-3 and resulted in \$2,796,950 in public assistance support and \$821,332 in hazard mitigation from FEMA (FEMA, 2022). This was followed by a derecho in 2020 which impacted a broader region of Iowa and exacerbated the infrastructure damage that had not yet been repaired from the 2018 tornadoes. Of the survey participants, 34 (97%) shared that they experienced one of the disasters, and of those respondents, 88% experienced the tornado and 100% experienced the derecho; 88% experienced both events.

In Marshall County, discussions around the impact of multiple disasters back-to-back were discussed at length. The 2018 tornado, while only impacting a portion of the community, devastated certain areas and damaged homes, removed trees, and created damage to properties in town. One individual shared their need to “separate the derecho from the tornado...[we were] still in early recovery phase of the tornado when the derecho hit,” and another shared “for the people that were in the original tornado path, the derecho made things 1000 times worse and more challenging...we are already a poor community, and [for] folks that are underinsured or uninsured, this has been crippling.”

Texas

Bastrop County has been involved in 10 designated disasters since 2011 according to FEMA (FEMA, 2022). Bastrop County initially was going to focus on the Lost Pines Fire of 2011 which resulted in \$12,571,783 in public assistance and hazard mitigation from FEMA (FEMA, 2022). However, during interviews, individuals also shared about additional natural

disasters such as hail, flood, wind, tornado, and drought, and then they experienced another extreme natural disaster Winter Storm Uri during the research timeframe.

Seventy-one survey participants (93%) shared that they experienced a natural disaster, and of those who experienced a natural disaster, 59 (83%) experienced more than one event. Increase in mental stress and damage to home or property were the most common impacts across all disasters, with the Lost Pines Fire creating the most stress. Many individuals shared that while they did not experience the fire firsthand, there was an immense amount of community outreach and support and concern for neighbors through this event. The Lost Pines Fire also has long lasting impacts on mental and physical health with continual concern about fires and trauma from the event. Participants shared, “The mental impact that the fire had, [we] still see some struggle. This mental impact is what made the Bastrop County Cares come together;” (a community organization supporting disaster response) and “people are still really not over that, it was a huge traumatic event, and took out a lot of housing.”

Winter Storm Uri created the most issues of all storms for loss of essential provisions, where many experienced losses of power and water for days and in some cases weeks. Communication concerns were shared as a gap across the county, especially related to expectations and preparedness for storms. Participants mentioned that natural disasters highlighted the communication constraints that exist including access to internet service and messaging needed as text or phone call.

Virgin Islands

The Virgin Islands has been involved in 4 designated disasters since 2011 according to FEMA (FEMA, 2022). In addition to proclaimed natural disasters, droughts have also impacted farmers, businesses, and individuals. The years of 2014-2016 brought extreme drought conditions to the Caribbean (USDA Climate Hubs, n.d.); where the territory relied on deliveries of hay and

water to support the agricultural sector (Natinonal Integrated Drought Information System, 2021). Again, in July 2022, St. Croix and St. John experienced extreme drought (D3) and St. Thomas with severe drought (D2) (Natinonal Integrated Drought Information System, 2021).

Interview, focus group and survey participants were asked to reflect on their experiences of natural disasters. Fourteen (78%) of survey respondents shared that they experienced Hurricane Irma and Maria. The Virgin Islands had losses of over \$1.5 billion dollars economically occurred in the US Virgin Islands territory through loss of wages (\$398 million), lost government revenues (\$576 million) and commercial property damage (\$561 million) (FEMA, 2018). A key component that came from the discussions with farmers in 2018 following the hurricanes was the need to be able to get to their farm and animals quickly. However, due to safety protocols, many individuals were unable to travel on the roads. This led to increased loss of animal life as well as additional destruction to property. One farm shared that when they were unable to repair fencing, “had a lot of wild dogs that had gotten to goats...all but one goat [died].”

Natural Disaster Case Study Comparison

Survey results indicate that hurricanes in Virgin Islands (2017), the Derecho (2020), and Tornado (2018) in Marshall County, Iowa show the most impact on individuals (Figure 2-2).

This is most likely due to the extreme nature of the events and the devastation to infrastructure, natural capital, and personal injuries. As mentioned previously, each storm resulted in millions of dollars in damage for the community, and significant rebuilding for individuals. These storms were also recent and could be an indicator of relevance on participant’s minds. For example, it was anticipated that the Lost Pines Fire in Bastrop County, Texas would have higher impacts because of the extreme nature of the fire. The fire was the

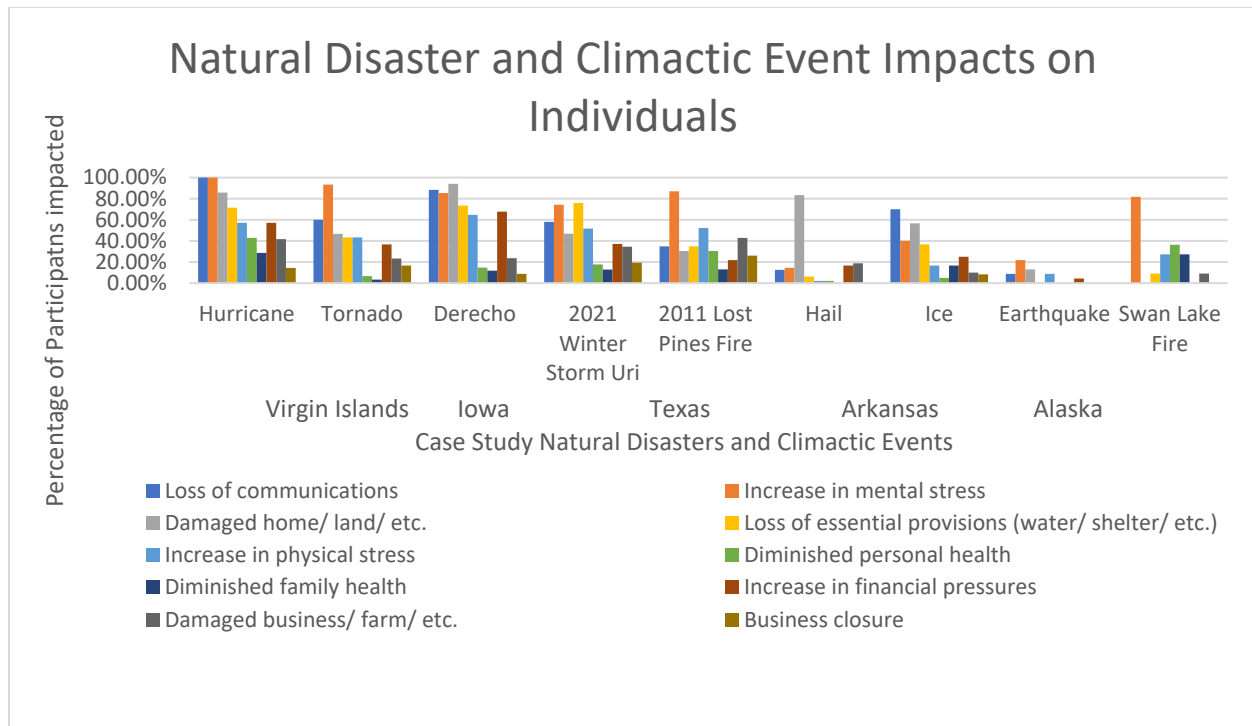


Figure 2-2: Natural Disaster and Climactic Event Impacts on Individuals

largest in state history and lasted 55 days, destroyed homes, built infrastructure and natural capital. (Texas Parks and Wildlife, 2011). However, this event occurred in 2011, and many respondents for this research were not around when the event occurred.

A common vulnerability addressed in each of these communities was communication concerns. Participants mentioned that storms highlighted communication constraints, whether access to internet service and messaging needed, such as text or phone call to offer alerts. A focus group in Bastrop County, Texas centered around communication and the goal to provide updates and reporting to the community every 2 hours. Damage to home, land, or farm was the second highest area of impact. Based on the damage from storms, individuals detailed their need for access to farm equipment and processing equipment for value-added product development. This would allow for value-added product development prior to a storm and extend the season

and sales ability if proper storage capacity was available. Additional damage was seen to farms and property when individuals were unable to access their farm quickly. For example, individuals shared the need to get to the fields or farm property post-storm more quickly to check on damage, animals, and crops. While loss of production is expected during a storm, other aftermath includes impacts around tourism and sales, leading to a second shock to businesses. Beyond damage to their land, product, and home, they may experience a secondary impact from decreased sales as the full community recovers, as well as rebuilding costs.

COVID-19 Impact

Alaska

Of those who experienced COVID-19, 25 (71%), also experienced at least one natural disaster that happened within the same time frame. Experiencing both COVID-19 and disasters influence mental and physical health, including general fatigue from exposure and worry, and stress related to financial and employment constraints that have occurred due to supply-chain and corporate closures. Survey participants mentioned mostly being impacted by increased mental stress and inability to see friends, with each showing over 85% experiencing these indicators. Individuals were able to add in “other” impacts, which highlighted the stress, fatigue, and frustration that they experienced within their community during COVID-19. A few responses included: “disappointment in my larger social circle, acquaintances, etc. and their complete disregard for other humans,” “Uncertainty about so many aspects of life especially planning for future,” “Difficulty finding staple food items (grocery stores were sold out of things like rice, beans, canned tomatoes, flour, etc.). This was more of a problem in spring of 2020 but continues to be a problem with certain less crucial items from time to time.” Overall, individuals saw the impacts of COVID-19, and the ability to respond, in a mixed way. Some felt isolated, alone, and were fearful, and others reported very minimal impact and ability to go on with daily life. Many

organizations also moved to new ways of doing through virtual meetings and educational options.

Arkansas

One hundred and one (93%) of survey respondents shared that they experienced COVID-19. Of those who experienced COVID-19, 73 (72%), also experienced at least one climactic event that happened within the same time frame. The most significant impact for individuals with COVID was being unable to see others and the mental stress that COVID-19 caused. Responses to an open-ended question about next steps demonstrated how severely COVID-19 affected mental stress among community members. It was evident through the overwhelming responses that there were feelings of fear, anger, and general contempt for others in their community around vaccinations, mask mandates and opinions about facts related to the pandemic.

Within interviews and focus groups, many spoke about the opportunities that virtual meetings and webinars had but also realized the lack of access to broadband, multi-lingual communication, and access to resources. Farmers Markets, restaurants, and other market outlets closed, and many farmers lost contracts, leading them to seek out their own sales through direct-to-consumer and online options, which has continued to be a “new way of doing” in hybrid formats. Individuals shared their fear of the future due to lack of “not knowing” and general stress over how individual community members are responding. While many hope that the new interest in locally-sourcing food and consumer demand for local will continue, concerns that individuals will forget about the supply chain shortfalls and go back to the “old way of doing” were prevalent. One person shared that the “pandemic also forced interest in local healthy food... seeds sold out and folks started gardening and farming... people who never considered it are now interested in agriculture.” Another stated, “People very quickly became interested in

growing [their] own food; there was a panic from people, and it shows how far removed we are from even 50 years [ago] as far as food production; this led to an opportunity (what can I grow here);” and yet another perspective, “[my] personal habits [changed], I did pick up from Walmart- but typically didn’t shop there at all, so that changed because of convenience of pick up and the weird outages of products that happened, it became an easy thing to do; we also started buying specialty options online.”

Iowa

Thirty-three (94%) of survey respondents experienced COVID-19. Of those who experienced COVID-19, all experienced the tornado and derecho. Participants mentioned mostly being impacted by increased mental stress and inability to see friends during COVID. A smaller amount of survey participants, about 50% experienced an increase in financial pressures, and around 40% experienced an increase in physical stress. Overall, individuals saw the impacts of COVID-19, and the ability to respond, in a mixed way. Some felt isolated, alone, and were fearful; one interviewee shared that there was “a steady increase in mental health related calls and needs for social services [during COVID-19].” Another mentioned “having less social interaction caused concerns” while another participant spoke about how they saw “profound sadness in the elderly population...sadness is a large concern.”

Regarding food supply and access, individuals reported gaps in availability at the grocery stores. One individual shared, “There was meat shortage in the grocery store that was kind of scary for folks, and the locker in State Center was sold out of everything...there was a quick panic.” A farmer participant shared that their cattle production totally collapsed during COVID-19 and had to sell all their cattle: “The cattle ended up being sold for half of what they’re worth...and having them on feed for a month [was] also not the right quality; other friends with confinements had to kill 1,000 head to 2,400 and just euthanize.” On the other hand, the school

districts were said to be supportive by having “meals taken into neighborhood, and children were still able to get lunches.”

Texas

Of the survey participants, 70 (92%), shared that they experienced COVID-19. Of those who experienced COVID-19, 66 (94%), also experienced at least one natural disaster that happened within the same time frame. The most significant impact for individuals was being unable to see others and the mental stress that COVID-19 caused. While several organizations moved to virtual settings, interview and focus group members shared that this worked smoothly and has continued to be a “new way of doing” in hybrid formats. Individuals shared their fear of the future due to lack of “not knowing” and general stress over how individual community members are responding. One person shared that they wondered where the spikes in cost were coming from and “wondered where this is coming from- is it greed?” while another spoke to the “hoarding that began, and when [people] saw the hoarding, there was fear on how to respond.” This was also directly correlated with being involved in previous disasters, and a trigger of fear was realized through the act of watching people hoard.

It was also critical that services, such as the farmers market, were deemed to be essential businesses so they could continue to operate. These services stayed open and were frequented due to new technologies that allowed for customers to pre-order and pick up, as well as new door-to-door delivery options that occurred. When it comes to considering how to maintain new programs, like food box delivery or curbside delivery, one individual shared that “[this] program became a more expensive and labor-intensive program; [they] have gotten a number of COVID grants in the past year – wrote a lot of grants... but it is a little worrisome thinking about what this will be like this coming year.”

Virgin Islands

The most significant impact for individuals was having family members with diminished health, increase in mental stress, and inability to see others. All survey participants experienced COVID-19. While several organizations remained open, they moved to virtual program offerings and online sales options. It was perceived that businesses that already had a web presence were able to respond better during COVID, and they had the ability to maintain clear communications with customers. Farms and other businesses were forced to consider the best strategy for continuing retail sales. One individual shared that “if we reopened retail, we need a new structure that is bigger for social distancing...and that may not make sense [for our business].”

COVID-19 had a direct impact on the food system within the territory. Individuals saw an increase in interest for gardening and farming as well as people buying local. This increase in interest led to constraints with finding materials in the store. One person shared, “it was impossible to find seeds on the shelf; people started gardening and getting into their own [garden].” Individuals also felt that COVID highlighted the dependency on a global food supply chain, and the constraints that this caused with infrastructure and distribution. A participant shared, “because of the same food security issues and the high import rates, it has made us need to understand the food imports, it reminds us of the hurricane and critical aspects of being self-sufficient.”

COVID-19 Case Study Comparison

Inability to see family, friends, and social networks, and increase in mental stress were the top identified impacts to individuals across all communities (Figure 2-3). Virgin Islands had one outlier, with seeing a high percentage of diminished family health. Within the Territory, individuals reported that family members may need to travel to the mainland to receive more

urgent and critical care that was not available on the islands. Due to the hurricanes in 2017, much of the healthcare system is still being rebuilt, and has caused limitations in access to healthcare.

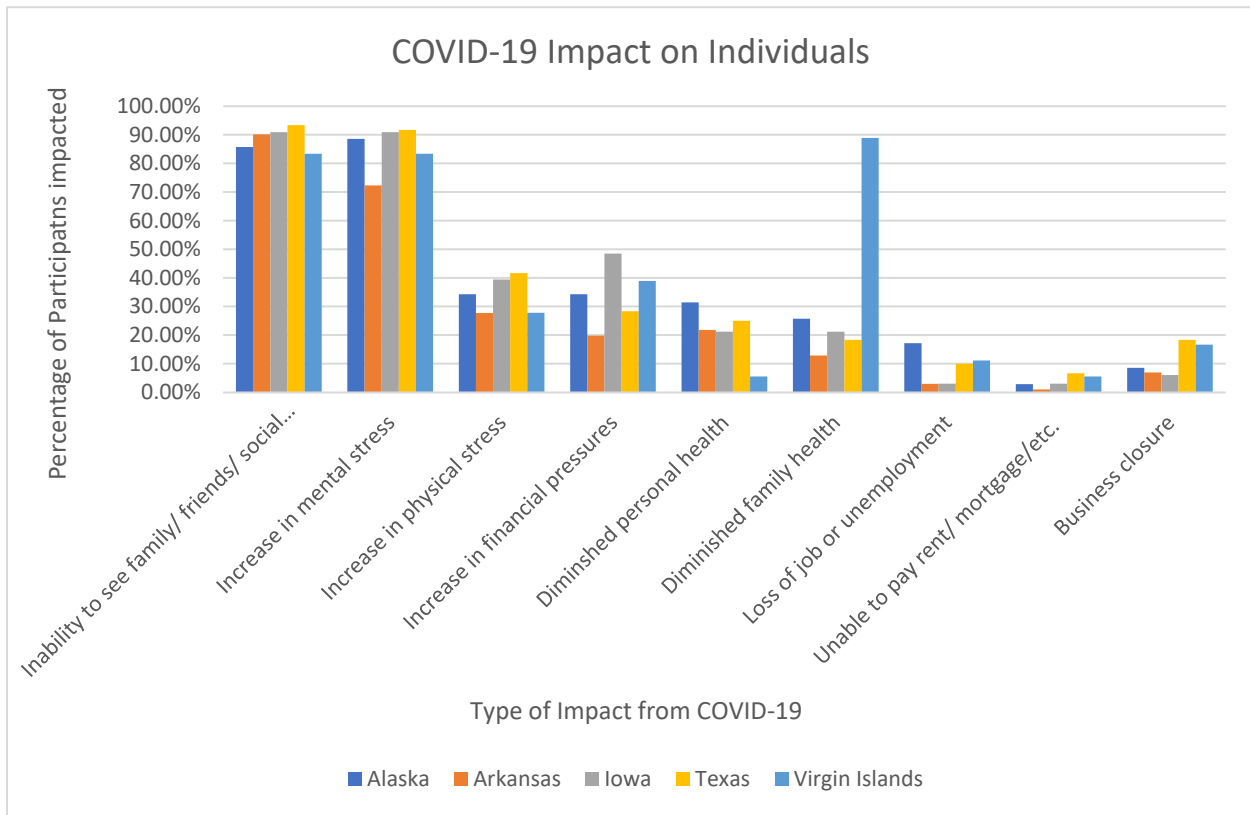


Figure 2-3: COVID-19 Impacts on Individuals

COVID-19 responses across all communities showed frustration and anger towards how individuals, community, and government handled response. Interviews, focus groups and survey responses detailed the stress, fatigue, and frustration that individuals experienced during COVID-19. Individuals shared that they were “disappointed in [their] larger social circle, acquaintances, etc. and [others] complete disregard for other humans,” another mentioned, “[I have] uncertainty about so many aspects of life especially planning for future.” Others discussed issues with food access, one participant shared “[I have] difficulty finding staple food items (grocery stores were sold out of things like rice, beans, canned tomatoes, flour, etc.)... This was more of a problem in spring of 2020 but continues to be a problem with certain less crucial items

from time to time,” and another participant stated they have a “delay accessing community resources for needs.”

While not directly related to this study on resilient community food systems, each case study had survey, interviews, and focus groups discuss vaccinations. However, social and cultural capital came into question when individuals questioned why others would choose to receive vaccinations. For example, there was a perceived divide on interest for vaccination based on cultural practices. One individual shared, “there has been a mix of who wants it, some boomers and older generations want [the vaccine] and younger don’t.” Another stated, “culturally, there has been a big hesitation around the vaccine.” Some communities shared their desire for utilizing food as medicine; “stop pushing medicine when we have medicine in our yard- our food.” This also connected to general frustrations in political leadership. One individual stated, “[I am] discouraged by politics/lack of leadership,” while another mentioned, “[our Governor] and [Legislature] should allow cities and schools to set mask and vaccination regulations and should allow us to have vaccine passports;” and others who said they would have liked to see their community “get back to normal. No more mask mandate, recommend and move on.”

Impact Comparison

COVID-19 and natural disasters, while different, highlight the breadth of impact on a community and the residents within. COVID-19, for example, created intense mental stress and response fatigue across all communities (Ingham, Hicks, Islam, Lukasiewicz, & Kim, 2022) . The pandemic showed less impact on physical stress and financial pressures than natural disasters, but individuals still reported being unable to work, losing jobs, and having diminished health for periods of time that also then led to increased stress. Natural disasters resulted in high percentages of mental stress, but was due to needing to respond, clean-up and determine next

steps, versus having uncertainty about the future. Loss of communications and damaged property also increased the stress toll on individuals in response to natural disasters.

Each type of disaster shows the potential for communities to respond together. There is an urgency and need for communities to return to normal, such as cleaning roadways, rebuilding structures, and repairing infrastructure that occurs fairly immediately in response to a natural disaster. If done continuously, through back-to-back disasters, this can lead to burnout and fatigue of volunteers and residents. Residents described their disaster fatigue as they continued to respond to new disasters (whether natural or manmade) and the urgent matters that regularly arose in the community as well as the trauma of each event. In many cases, individuals reported not feeling that responders cared about the impact, and were moving through the bureaucratic motions of paperwork, which was also a hinderance to access for recovery.

COVID-19 showed the vulnerability and lack of adaptive capacity in communities for response to a pandemic, but a silver lining was that several shared that having dealt with a disaster prior to COVID-19, they had strategies in place for response. For example, one focus group respondent in... stated that, “Disasters taught us that all the things we designed and developed as a result of the hurricane had even more relevance as the pandemic took hold- these outdoor food container stores (tiendas) are probably much safer than going into a grocery store – this was very enlightening.” Individuals identified issues with adaptive capacity and the lack of communication materials and bilingual options for sharing about what to do for COVID-19.

Each community discussed bottlenecks within the global food supply chain that occurred during COVID-19. There were intense pressures on the system that left grocery store shelves unstocked and pushed people to consider more local options for buying food. Services like the farmers market and other retail outlets for farms were opened through innovative policies. A

participant shared that “because of COVID, [we] needed to relocate the market ground for social distancing. The new market is growing and there are a lot more vendors.” Businesses also became more tech savvy, one resident shared, “there are additional food-based businesses like food trucks, farm tiendas and roadside stands available.” A constraint with food supply during COVID-19 was meeting the need of school meals and adapting for children to still access food, a participant highlighted this by stating “many young people get at least some of their meals from schools, so when those shut down, it took meals out of some young people’s mouths.” Other programs stepped up to deliver food to individuals who didn’t have access. This included “delivery of fresh foods and drop off bags to the [healthcare] and senior centers” and “Health and Human Services launched an inter-island food delivery program to help people that were at risk through door-to-door delivery.” However, with this shift, it also pushed communities to consider policies and ways of remaining open amidst the pandemic. As COVID-19 progressed, individuals became more willing to be out in public, and as comfortability rose, the buying patterns of consumers returned to the ease and convenience of going to the grocery store.

Comparison of Compounding Disasters: Iowa and Virgin Islands

While these events alone cause great stress, when they are coupled, they create a more monumental hurdle (Ingham, Hicks, Islam, Lukasiewicz, & Kim, 2022). One participant shared this connection well, “[There is] something so interesting in the United States and the intersection of covid and natural disasters- it lays bare the inequality and vulnerability of those who work in our food systems and those who run our food systems.” Each case study community that participated in this study had additional storms during the research and within COVID-19. Two communities had federally proclaimed natural disasters from FEMA during COVID-19, and others had additional natural disasters like ice, hail, or droughts. Marshall County, Iowa experienced a Category 3 tornado in 2018 and were still going through rebuilding and

construction when COVID-19 began. This led to decreased labor, staffing, and financial capital to support recovery. Then, in the summer of 2020, a derecho went through most of the state of Iowa. Individuals shared that due to the tornado in 2018, there was a loss of tree cover and there had already been damage to buildings, that were still being reconstructed. The derecho then further debilitated the community and pushed back the recovery period. One interviewee shared, that it was “hard to separate the derecho from tornado. [We were] still in early recovery phase of tornado when derecho hit,” and another stated, “the derecho touched every inch [of the community] and everyone was impacted at some level; the people in the original tornado path- the derecho made things 1000 times worse and more challenging; [we are] already a poor community and folks that are underinsured or uninsured...[this] has been crippling.” Furthermore, COVID-19 limited the number of volunteers and support for response, however, according to one individual, “Covid almost went out the window because [we] needed emergency response; covid for about a 3-week period was a backburner issue, [we] weren’t focused on mitigation, too much other chaos to deal with.”

The hurricane and derecho show two indicators of vulnerability, one is time between storms, and the second is the breadth or region of impact. An aspect of resilience and ability to respond is the scope of impact from a disaster (Himanen, Rikkonen, & Kahiluoto, Codesigning a resilient food system, 2016). Natural disasters are more localized in size to that of a global pandemic; however, both cause extreme impact across a locale or region. To respond, it was essential to have both response ability internal and external to the disaster zone. For example, during hurricane Irma, St. Croix, sent over food and other materials to their neighbors in St. Thomas to support their recovery. However, shortly after, Hurricane Maria hit the full territory, and St. Croix was then without their food storage and materials they would have typically had on

hand. When the entire territory was devastated by the second hurricane, both due to the extent of the disaster and due to loss of provisions, it was essential to have external support for response. This was also seen in the Lost Pines Fire in Bastrop County, Texas. One individual shared about the reliance on external partners to help bring feed and other amenities for their livestock, or in Iowa, following the tornado, a local business had partners in other states help to make meals and feed the community. Thus, having networks and relationships both internal and external to the disaster zone was identified as being crucial to recovery, beyond that of National response groups like Red Cross and FEMA. While it is necessary for individuals and communities to have the awareness and understanding of response within their own community, it is also essential for networks outside to be able to support. Additionally, after response and recovery is underway, there other needs identified. An example of this includes response in the Virgin Islands, and necessary partners and support agencies to help assess and understand the impact of farmers by listening to stories and being on site. Iowa State University was able to provide capacity and compassion to those that had gone through the event. These were crucial relationships for response and showcase different community capital needs identified for support.

Key Community Capitals

As discussed, social capital and relationships were of primary importance in response to both manmade and natural disasters. Natural and built capitals were also discussed frequently for resilience, and the need to protect and preserve the natural state and ecology of a place. Ensuring natural capital and appropriate stewardship allows for recovery to the ecosystem more rapidly (Schipanski, et al., 2016). For example, in Texas and Alaska, individuals shared concerns about the rapid pace of urban sprawl, housing developments, increased road infrastructure, and impact development will have on the natural environment. However, resilience was also found when sound infrastructure was present that can withstand storms and allow for individuals to develop

new businesses around food would be beneficial. For example, in Iowa, Virgin Islands, and Alaska, increased meat slaughter and processing, as well as added-value fruit and vegetable production was identified as a top priority to increase resilience. To support this, increased scale of production and buildings are necessary, as well as transportation and distribution routes to market communities. Due to the need for infrastructure and scaling, having both resilient building practices with care for the land will be necessary for our community's future. This includes adequate care for the land and natural environment in which the built infrastructure will be located, and to plan space *with* the natural environment. The Kenai Peninsula, Alaska stated their lack of resilience with built infrastructure because there is only one road in and out of the town. While the community recognized the need for scaling up production and infrastructure to access new markets, they are cognizant of the impact that it could have on the natural water ways, landscape patterns, and ecology. Another example of this juxtaposition is Bastrop County, Texas where individuals shared that they are thankful for their proximity to an urban center for sales and market, but it also diminishes their natural environment, and there are concerns about the rapidly declining agriculture and natural spaces due to sprawl. These examples articulate how resilience takes a conscious effort. Assessing each community capital and determining the best option to move forward is necessary for increasing resilience across the community.

Resilient Community Food Systems

Based on our findings, we propose a new definition for resilient community food systems (RCFS): the capacity for a place- and values-based food systems, and the actors within, to be able to withstand shocks and disruptive pressures while maintaining basic structures, processes and functions of and within the community food system and supply chain, ensuring the ability to produce and access nutritious and culturally acceptable food over time and space, and creating a new normality (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020). We also

acknowledge the need for adaptive capacity for communities in the face of disaster; without individuals and organizations willingness to react and respond in innovative ways, the ability to be resilient can be diminished. Additionally, transformation is a necessary option for communities to acknowledge in the face of disaster, whether environmental or social (Walker, et al., 2006). There will be times when the ability to adapt is not possible, or is not the best option, and the need to fully transform into a new paradigm will be necessary. Having decision makers, leaders, and community members in place that are willing to shift and lead in those difficult decisions is a necessary piece of a resilient community food system.

To further conceptualize this definition, and to understand resilience, adaptive capacity, and transformation within a community food system, Figure 2-4 shows the evolved conceptual framework that ties together community development processes that assess impacts from both

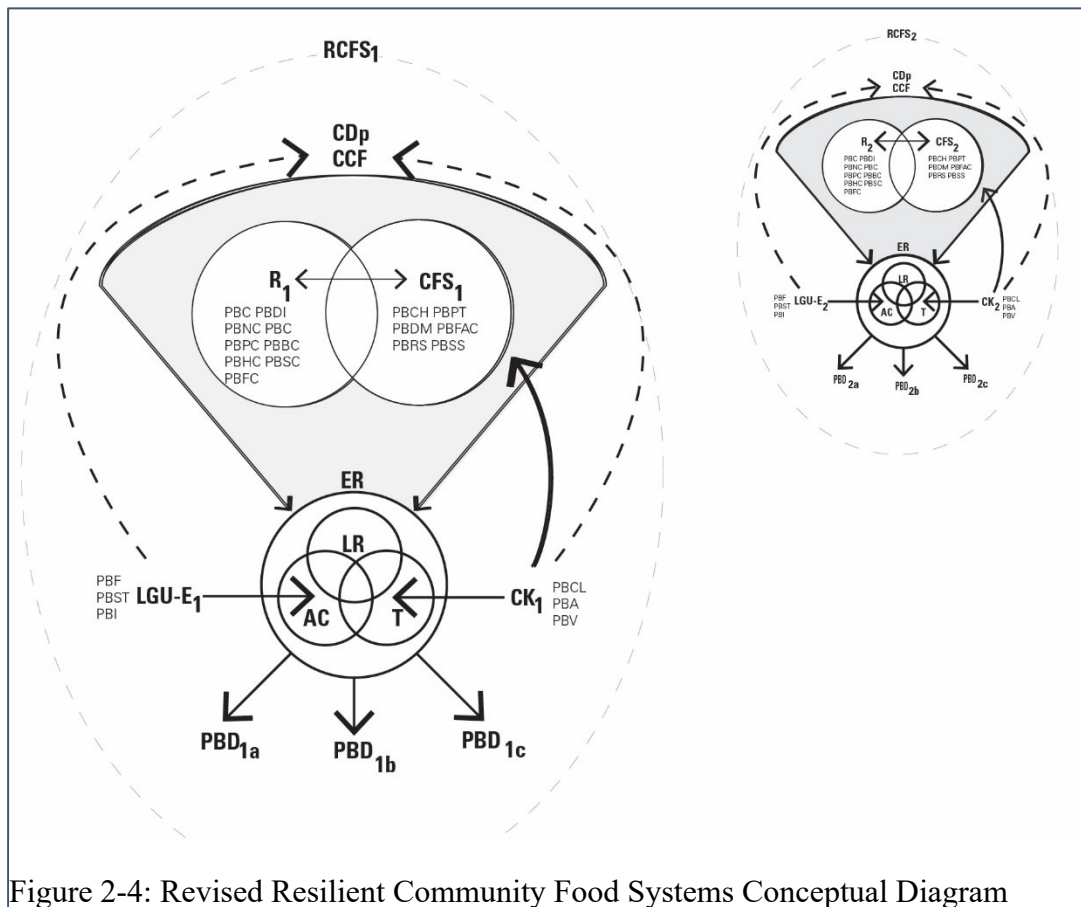


Figure 2-4: Revised Resilient Community Food Systems Conceptual Diagram

manmade and natural disasters, the connection of community actors and organizations, and the possible organizational support for response. This framework highlights additional aspects and specifics that are relevant to assessing and developing increased resilience for a community food system. A legend for terms is provided in Table 2-7, with definitions in Table 2-8.

Table 2-7: Resilient Community Food System Legend

Primary Themes	Indicators
Resilient Community Food Systems (RCFS)	
Community Development Processes (CDp)	
Community Capitals Framework (CCF)	
Evaluation of Resilience (ER)	Level of Resilience (LR) Adaptive Capacity (AC) Transformation (T)
Community Food Systems (CFS)	Cultivation and Harvesting (CH) Processing and Transformation (PT) Distribution and Marketing (DM) Food Access and Consumption (FAC) Resource Stewardship (RS) Scale (SS)
Resilience (R)	Climate (C) Disaster Impact (DI) Natural Capital (NC) Cultural Capital (CC) Built Capital (BC) Political Capital (PC) Financial Capital (FC) Social Capital (SC) Human Capital (HC)
Land Grant university Extension (LGU-E)	Funding (F) Staff (ST) Interest (I)
Community Knowledge (CK)	Awareness (A) Customer loyalty (CL) Values (V)
Place-based development opportunities (PBD)	Opportunity 1 (1a) Opportunity 2 (2a) Opportunity 3 (3a)

First, the overall circle on the left showcases a place-based resilient community food system (RCFS). Within this system, Community Development processes (CDp) with understanding of Community Capitals Framework (CCF) can be utilized to assess, determine, and plan resilient community food systems (RCFS). Specifically, these processes can assess the

Resilience (R) and the Community Food Systems (CFS). After assessing these conditions, additional information will be needed to evaluate resilience (ER) and recovery practices, specific to level of existing resilience to shocks and stressors (LR), adaptive capacity (AC), and the need for transformation (T). To do this, understanding Land Grant University Extension capacity (LGU-E) and Community Knowledge (CK) can be helpful. Finally, from utilizing the CDP, identification of place-based development (PBD) practices can be determined. Additionally, indicators within each of these concepts have been added (See Table 2-8).

Table 2-8: Place-Based Indicators within Primary Categories of Conceptual Framework

Community Food Systems (CFS)	Community Actors Knowledge, Awareness, and Interest (CK)	Resilience (R) and Community Capitals Framework (CCF)	LGU-E
Cultivation and Harvesting (CH) May include Production type- (livestock, forestry, specialty crops, dairy, etc.); Scale of community food system (local/ regional/ national/ international (export))	Awareness (A): May include consumer, retailer, and wholesale business awareness of community food system products; awareness of resilience, planning and response	Climate (C): Predictability of systems impacts (foresight, predictability, climate patterns, and records of past events)	Funding (F): Federal, state and local financial support for general extension programming and food systems involvement; Financial and business structure of place-based LGU-E
Processing and Transformation (PT) May include Infrastructure (built infrastructure, storage, structures), number of processors	Customer loyalty (CL) May include sense of loyalty/ perception/ sales	Disaster Impact (DI) exposure to disaster and extreme events, frequency of impact, strength, and duration of disaster	Staff (ST): Number of staff dedicated to food systems, community development and resilience efforts; Time and dedication of staff members (i.e. full-time staff/ part-time/ etc.)
Distribution and Marketing (DM) May include Infrastructure (built infrastructure, storage, structures), proximity to primary retail markets, number of distributors	Values (V): personal and community values that relate to the interest in supporting or participating in community food systems	Natural Capital (NC) Ecological and systems boundaries, land-use, environmental protection, production practices	Interest (I): General interest from administration and staff for RCFS; Attitude towards participation within food system/ networks/ community)
Food Access and Consumption (FAC): may include Markets (demand/ distance to external markets/ imports); number of food retailers and interest		Cultural Capital (CC) historical knowledge, different cultures, diversity, acceptance, interest and general care for one another	
Resource Stewardship (RM): may include activities for conservation, stewardship, care for the land; number of organizations supporting with food donation programs, etc.		Built Capital (BC) number of producers/ processors/ distributors/ retailers; transportation systems; quality of built environment	

Table 2-8 Continued

Community Food Systems (CFS)	Community Actors Knowledge, Awareness, and Interest (CK)	Resilience (R) and Community Capitals Framework (CCF)	LGU-E
Scale (S): may include Size of food system (where begins and ends- geography, values that determine community food system (local/ regional), proximity to primary retail markets)		Political Capital (PC) regulatory framework, rules, and values; governance, appropriate and supportive policies, elected officials' interest	
		Financial Capital (FC): Economic development, GDP, Standards of living, economic health	
		Social Capital (SC) number of networks/ regional groups/ strength of relationships; Norms, trust, closeness of community, shared norms, bridging and bonding capital	
		Human Capital (HC) Demographic trends (population growth, trends); formal and informal leadership, education levels, attitude	

Community Food Systems (CFS) and Resilience (R) are intertwined and support each other in their unique, place-based features such as geography, necessity, population, and climate leading to a resilient community food system (RCFS). The conceptual framework suggests that when resilience is assessed by community capitals in relation to community food system components, communities can identify the level of resilience (LR), adaptive capacity (AC) and potential need for transformation (T), which in turn, supports further resilience for their community food system. To fully assess and determine the needs for a RCFS, community knowledge, awareness, and interest (CK) must be taken into consideration, along with key identification of place-based indicators that revolve around variables that encompass specific food system sectors, organizational capacity, community capitals, and disaster impact. Thus, if each are working together, RCFS can be achieved and may develop new place-based development options (indicated in figure 2-7 as PB1a, BP1b, etc.).

The conceptual framework suggests that through the process of CDp with CCF, this process and assessment framework can be universally applied in place-based communities to develop RCFS and create specific place-based development (PBD) projects. Transferability is shown through the numeric signs ‘1’ in the primary visual and leading to a second conceptual framework with numeral ‘2’ as an indication that this is a transferable assessment process that can be utilized within multiple communities. Similarly PBD “a,b,c” refers to unique place-based aspects that are developed per place-based community. Note, that this is not suggested to say that there is a blueprint strategy that can be applied to all communities, rather, that there are replicable processes that can be utilized to assess and understand place-based practices and opportunities for the creation of RCFS.

To operationalize this conceptual diagram, Table 2-9 displays a potential framework for acknowledging levels of resilience and dig in deeper to resilience and assess the various areas of vulnerability, resilience and adaptive capacity for the community based on the community capitals framework. To test this out, a detailed review of quotes from the research are shown in Appendix A.

Table 2-9: Community Capitals and Resilience Component intersections as a framework for assessing food systems (See Appendix A for examples)

	Natural Capital	Cultural Capital	Human Capital	Social Capital	Political Capital	Financial Capital	Built Capital
Vulnerability							
Resilience							
Adaptive Capacity							
Transformation							

To showcase examples of this framework, narrative is shared from each of the case studies. One example of a vulnerability within natural capital was expressed from a farmer in

Arkansas, “If climate change is as serious as we are talking about and there will be more drought/s etc. over time, and the streams and wells have come to a level that they won’t provide for our community, what will we do? We need more water for the farmers we have now.” This vulnerability shows both the lack of water access, and a potential solution through built capital and water infrastructure like cisterns. Another built infrastructure vulnerability was an individual from the Virgin Islands, stating “there is a road below that is still torn up and still needs to be fixed from [the hurricanes].” In this case, while the road was the main concern, it also shows gaps in being able to respond politically and financially for repairing the road. Community members were left feeling like they did not have social, political, or financial support to respond and were still in need of repairing built infrastructure and determining ways of being more environmentally resilient. Through conversation, a transformative measure was identified, this included identifying ways that “dams could be filled; pumps could be taken; and cisterns could be filled every day.” This is a transformative idea, because it requires a completely new way of handling the political climate and restructuring the built infrastructure to hold more water. To do this, farmers and community members would need to increase their social capital, policy change for structures on rented land, social action, and knowledge change would need to be shifted to make it a reality.

Another example of a vulnerability within social systems was burnout. An individual in Iowa shared that they “have seen a lot of efforts like [food systems innovation] start and get going and then something throws a wrench in it, and it fails... The worst part of [this] community [is our] communication gap.” This depicts one example of how social capital and networks can be a vulnerability if they are not in place or are not trusted. In Alaska, an individual shared that they had resilience because, “Overall, the people want to come together and learn

from each other, this is a greater majority – and think throughout [our county] people help in both times of need and times of good.” In this case, social capital led to a higher level of resilience. Within social capital, an individual in Alaska highlighted how social capital provides adaptive capacity, and stated, “It’s one of the places that there is so much going on and largely accessible- and people can find their “community”.” Because of adaptive capacity, and individuals and groups willing to respond, resilience was stronger.

Unfortunately, not all case study communities spoke to their adaptive capacity and connection through social networks and action-oriented ability to respond and connect. An example of social capital needing transformation was shared within Bastrop County, Texas, they believed “there is also a lot of entitlement based on family [wealth, heritage, and longevity in the community]; especially in regard to favoritism within the political realm and there is bias...This shows up in general too and is clearer on the political realm and implementation of policies – even like city ordinance implementation.” This case study identified the need to create strategies for collaboration between groups, such as a county-wide coalition for food system resilience, including prevention, response, and recovery. This is viewed as a transformation because of the necessary change in structure to work across groups that have not previously worked together. Individuals will need to transform and shift their ways of operating to convene and collaborate on future needs.

Conclusion

After reviewing food systems, community capitals and resilience frameworks, it is believed that understanding and assessing pre- and post- conditions based on each area will help communities understand their level of resilience, adaptive capacity, and need for transformation. It is recognized that some communities have more adaptive capacity due to their existing social

networks, trust, and connections, as well as their individual knowledge and understanding of community capitals.

While all community capitals intersect with food systems and resilience, the most frequently discussed were social, built, and natural capitals. Social related to adaptive capacity and the ability for groups or networks to respond and act immediately. Social capital in this context also included the need for trusting relationships internal and external to the disaster site, and historical knowledge and respect for the community. Social capital also dovetailed with cultural capital and having respect for all community members and understanding of cultural practices prior to entering and working with a community. Built capital was more frequently discussed regarding sound infrastructure, transportation routes and logistics planning, and proper equipment, storage and building infrastructure for farm and food businesses. Built and natural capital frequently overlapped because of the complexity of planning systems and keeping natural amenities and ecological systems in place. This could include preserving waterways and land and could also include supporting opportunities for diverse production practices.

While social capital and relationships were seen as the key, especially in adaptive capacity, not all communities are set up with capacity to prepare, respond and recover due to limitations such as natural and built capital, political environment, and lack of leadership to think through and act for future generations. It is suggested that the resilient community conceptual diagram and assessment framework could help identify points of vulnerability, track levels of resilience and adaptive capacity, and determine if transformation is needed. With this framework, communities would be able to better prepare, plan, and respond when a disaster occurs. If they act on the findings from the assessment, they can create potential pathways for more resilient community food systems in the future.

It is also suggested that additional research be conducted around the interest and usability of a resilient community food system assessment, and the best ways to make the identified priorities actionable, specifically when transformation is identified in other areas. In combining these three areas, we aim to showcase the intersectionality between them. However, it is recognized that there are gaps in accessing data for this type of decision making, and currently this framework is predominantly qualitative based. This article focuses on qualitative methods and individuals' lived experience, but there may be exploratory methods of quantitative data discovery for resilience. Other areas of research are needed to determine ways to measure the level of resilience of a community in both qualitative and quantitative ways, which may connect to the frameworks for NOAA and FEMA previously mentioned. While this assessment is suggested as a place-based community strategy, there may be benefit in exploring regional or national assessments as well, specifically regarding adaptive capacity and social networks for responding to disaster in the future.

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Appendix A. Community Capitals and Resilience Component intersections as a framework for assessing food systems

	Natural Capital	Cultural Capital	Human Capital	Social Capital	Political Capital	Financial Capital	Built Capital
Vulnerability	If climate change is as serious as we are talking about and there will be more drought/s etc. over time and the streams and wells have come to a level that they won't provide for our community- what will we do, we need more water for the farmers we have now	There is a significant amount of segregation based on race and skin color – which is a problem, and threat limits [our capacity]	Small towns and the rural environment doesn't have enough knowledge base to get it going and keep it going	Have seen a lot of efforts like this that start and get going and then something throws a wrench in it and it fails à seeing in food / ag but also entrepreneurship, The worst part of the community- communication gap	The government has been giving agriculture lip service, but the DOA has continued to be cut and cut- and all the staff got an 8% payout- haven't had a raise since, the people support it, but the government just can't do anything	Everything is working here except capital: certain inputs (land, labor, capital, and knowledge/ TA)	Another issue that the infrastructure to support local food systems is pretty unattainable for most start up businesses
Resilience	Have the fastest growing farm area in the state have lots of great information with the most recent census of agriculture	Movement toward stewardship that is akin to the cultural values of indigenous people – its engrained in this land, and people's reverence for the land and respect for the animals	Best thing about it – a lot of creative people here, a lot of do-it yourself and self reliant folks and they are really into it (grow your own/ putting up fish and meat birds/ all kinds of people)	Overall, the people want to come together and learn from each other, this is a greater majority – and think throughout [county] this is strong in terms of helping in both times of need and times of good	Our State has a new law to attempt to get to 20% of food budget on local foods	Another good thing that came out of our fire disaster was building people's lives back with counseling and financial services,	We're a fairly rural county- but just outside [metro area], one of the advantages is the closeness to [metro], [our town] had an advantage to be in rural setting but still have the cultural activities and museums, concerts, etc., in [metro]
Adaptive Capacity	We have a local land trust that is doing great work	At the same time there is also an historical – and liken people in STX to native americans due to their connection with their land (similar to STJ, but unlike STT)—we are intimately connective and live in proximity to land	There is a value of self-sufficiency and growing their own and sharing their product	Its one of the places that there is so much going on and largely accessible and people can find their “community” – have connected with folks that have their community on the spot	The network [in community] are growing and working with the [elected officials], if you need to find someone [they] can do it, having the small community is easy to get information and find people	As a group envisioned and defined [our city] as supporting small farms and staying in local / individual ownership would provide a way to support that funding and that they started the connection between small farms and the [metro] restaurant industry	For farm to school- there is a collaborative group with 12 partners – many [State departments]/ [Extension]/ [University]/ etc. (all agencies), have been meeting since 2017 regularly to discuss farm to school
Transformation	Right now one of the biggest challenges is the growth and preparing for that, getting ready to go out for a bond election but along with that growth is first time home owners, families that are living in subdivisions that are manufactured homes (trailers) à seeing a groundswell of increased poverty - [need for considering best practices for built infrastructure expansion and ensuring access to natural capital; Educate about the complexities and intersectionality of community in formal and informal settings]	There is movement toward stewardship that is akin to the cultural values of indigenous people – its engrained in this land, and people's reverence for the land and respect for the animals à see those values coming back in to some of the places, Need more awareness of practices, Provide technical support and education around food as medicine and traditional food ways, develop trust and relationships with native people(s)	The sad part is that about 80% go out of state to University and 80% do not return, hopeful to hold more students rather than losing, [need program to support people staying within their community for college, Develop gardens and agricultural programs in colleges and K-12 schools]	There is also a lot of – entitlement based on family, especially in regards to favoritism within the political realm and there is bias... This shows up in general too- clearer on the political realm and implementation of policies – even like city ordinance implementation. Need to create intersections between groups for discussion and planning, Create a county-wide coalition for food system resilience, including prevention, response, and recovery	The Department of Agriculture is always broken and need to be reformed, there should be a law that if you leave the administration one year, you have to turn over all the records of the organizations that have been part of your community – [need for more accountability within government, Establish better social networks and mechanisms for engagement in policy development and government]	[They] aren't listening to what is being said on the ground level from students and from people who work with students, there is a high pressure to make money and to own a home that that's why they are moving away because of the promise for homeownership, [Need to educate on financial skills, Establish peer to peer networks, mentorship, and technical support options for existing and new farmers, particularly around risks within the agriculture and food business sectors]	Top priority is processing- we don't have processing for anything other than corn here, we have 1 meat locker in [our County], another just opened but doesn't include slaughter facilities, so only does processing, [Need for improving infrastructure and access to equipment and processing, Scale Up local agriculture through increased meat and specialty crop processing, gardening, and land access, Expand meat processing options, including storage, slaughter, and processing]

Appendix B. Disaster and Covid-19 Impact to Case Study Communities

Table 2-10: Comparison of impact of natural disasters on case study communities

	Loss of communications	Increase in mental stress	Damaged home/ land/ etc.	Loss of essential provisions (water/ shelter/ etc.)	Increase in physical stress	Diminished personal health	Diminished family health	Increase in financial pressures	Damaged business/ farm/ etc.	Business closure
Virgin Islands										
<i>Hurricane</i>	100.00 %	100.00 %	85.71%	71.43%	57.14%	42.86%	28.57%	57.14%	41.67%	14.29%
Iowa										
<i>Tornado</i>	60.00%	93.33%	46.67%	43.33%	43.33%	6.67%	3.33%	36.67%	23.33%	16.67%
<i>Derecho</i>	88.24%	85.29%	94.12%	73.53%	64.71%	14.71%	11.76%	67.65%	23.53%	8.82%
Texas										
<i>2021 Winter Storm Uri</i>	58.06%	74.19%	46.77%	75.81%	51.61%	17.74%	12.90%	37.10%	34.48%	19.35%
<i>2011 Lost Pines Fire</i>	34.78%	86.96%	30.43%	34.78%	52.17%	30.43%	13.04%	21.74%	42.86%	26.09%
Arkansas										
<i>Hail</i>	12.50%	14.58%	83.33%	6.25%	2.08%	2.08%	0.00%	16.67%	18.75%	0.00%
<i>Ice</i>	70.00%	40.00%	56.67%	36.67%	16.67%	5.00%	16.67%	25.00%	10.00%	8.33%
Alaska										
<i>Earthquake</i>	8.70%	21.74%	13.04%	0.00%	8.70%	0.00%	0.00%	4.35%	0.00%	0.00%
<i>Swan Lake Fire</i>	0.00%	81.82%	0.00%	9.09%	27.27%	36.36%	27.27%	0.00%	9.09%	0.00%

Table 2-11: COVID-19 comparison of impact on case study communities

	Alaska: Kenai peninsula	Arkansas: Benton and Washington Counties	Iowa: Marshall County	Texas: Bastrop County	Virgin Islands: Territory
<i>Inability to see family/ friends/ social networks</i>	85.71%	90.10%	90.91%	93.33%	83.33%
<i>Increase in mental stress</i>	88.57%	72.28%	90.91%	91.67%	83.33%
<i>Increase in physical stress</i>	34.29%	27.72%	39.39%	41.67%	27.78%
<i>Increase in financial pressures</i>	34.29%	19.80%	48.48%	28.33%	38.89%
<i>Diminished personal health</i>	31.43%	21.78%	21.21%	25.00%	5.56%
<i>Diminished family health</i>	25.71%	12.87%	21.21%	18.33%	88.89%
<i>Loss of job or unemployment</i>	17.14%	2.97%	3.03%	10.00%	11.11%
<i>Unable to pay rent/ mortgage/etc.</i>	2.86%	0.99%	3.03%	6.67%	5.56%
<i>Business closure</i>	8.57%	6.93%	6.06%	18.33%	16.67%

Appendix C. Approval for Research (IRB)

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Ethics
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 12/23/2020
To: Courtney Long
From: Office of Research Ethics
Title: Extension's Role in Supporting Resilient Community Food Systems in the United States
IRB ID: 20-471
Submission Type: Initial Submission **Exemption Date:** 12/23/2020

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

A modification was made in 10/04/2022 with approval shown below.

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Ethics
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 10/04/2022
To: Courtney Long
From: Office of Research Ethics
Title: Extension's Role in Supporting Resilient Community Food Systems in the United States
IRB ID: 20-471
Submission Type: Modification **Exemption Date:** 10/04/2022

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

CHAPTER 3. THE CONNECTION BETWEEN COMMUNITY ASSETS, INDIVIDUAL VALUES, AND PARTICIPATION IN COMMUNITY FOOD SYSTEMS

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A modified manuscript to be submitted to the *Journal of Agriculture and Human Values*⁴

Abstract

Individuals show their personal values through behaviours which are impacted by a myriad of contexts as they shop and interact in communities (Cairns & Johnston, 2018; Milani Marin & Russo, 2016). Individual values impact how and where people spend their money, the extent they are involved in community activities, and where they spend time (Carolan, 2016; Wilkins, 2005), including their participation in and support for resilient community food systems. This chapter details the dimensions of resilient community food systems and how individual community actors' values connect to their support of local food and farm businesses and the contribution to the social fabric of a food system. Their social fabric includes the participation in, and concern for, transdisciplinary aspects affecting community food systems that cut across areas of community capitals. The chapter is based on findings from a mixed-methods research study in five place-based communities and detail the connections between community actors' values and choices related to food purchasing. The findings show that while participants state a powerful desire and interest in supporting local food, individuals still value convenience and affordability over relationships with the local farmer or business owner, and in some cases more than the local product itself.

⁴ This chapter is currently a work in progress. It may differ in significant ways from the published version.

Introduction

Individuals' values impact social networks, business success, and community characteristics including resilience (Milani Marin & Russo, 2016). Individuals hold the power to choose where to invest and where to engage both personally and as part of a broader social network (Emery & Flora, 2006). Individuals, or community actors, include both formal and informal leaders actively engaged in community decision making (Emery & Flora, 2006; Prabhakar S. , et al., 2014). Individual values have been researched extensively, including a focus on the different types of values that individuals have, with both intrinsic and extrinsic characteristics (Furness & Nelson, 2016; Norvdall, 2014; Pascual, et al., 2017; Schroter M. , et al., 2020). This research seeks to further assess how values and consumer buying patterns intersect within the context of resilient community food systems.

Community food systems (CFS) are complex and interconnected systems, which rely on community actors to support and engage the system. A CFS is a values-based, relational, interconnected web of activities, based on a collective effort for the development of resources and people, which extends across all sectors of the food system (production, processing, distributing, consumption and resource management), as well as inherent interconnections to community assets (policy, education, equity, economy, environment, and wellness) (Chase & Grubinger, 2014; Christensen & Phillips, 2016; Feenstra, 2002; Long & Hohenshell, 2019). Resilience is related to community food systems because it connects to the ability of the system to respond to disruptions. Resilience can be defined as “the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity” (Walker, et al., 2006, p. 2). After a community goes through a temporal shock, there are short, intermediate, and long-term recovery processes that occur. Resilience can relate to communities, landscapes, and organizations and thus has become both a social-ecological concept as well as a

boundary and evaluative concept (Brand & Jax, 2007). Additionally, understanding how community actors (individuals, organizations, businesses, etc.) interact with each other, what they value, and how they participate in community may provide ways to enhance resilience (Emery and Flora, 2006; Prabhakar et al., 2014; Ruhf et al., 2017). According to Wilkinson's generalizing structure, "communities form linkages between individuals, organizations and agencies to integrate, coordinate, reinforce and mobilize common elements of their differentiated special interests for the community's welfare" (Brennan, Frumento, Bridger, & Alter, 2013). The inclusion of understanding values and attitudes within RCFS is critical because these systems are set up based on individual values, which therefore impact the important characteristics of the community at large (Feenstra, 2002).

To frame community values within the lens of a RCFS, first we review concepts that pertain to the definition of a RCFS, including the differences between local and regional food systems. Local and regional food systems include community-based values; however, they tend to be primarily focused on the geographic scope and range of production and distribution (Christensen & Phillips, 2016; Thilmany McFadden, 2015). Local food systems tend to focus more on the direct relationship and support for hyper-local farmers, producers, and makers. This can lead to a more purist or absolute take on the ability to source all products from a local community (Born & Purcell, 2006). Regional food systems engage in a larger geographic scale and assess the broad food-shed that food is produced, aggregated, and distributed from. While still interested in opportunities for economic growth and sales within a locality, regional food systems include a broader food-shed and look to the distribution area as the context (Horst & Gaolach, 2014).

There are additional areas of community that impact the broader food system including the social fabric of the place. Community Food Systems have similarities to regional and local geographic boundaries, are place-based systems, but they are determined in scale, value, and goals by its constituents. A community food system is typically derived from a community process that assists in utilizing community knowledge to inform decisions about food systems and include understanding all scales – local, regional, national, and global inputs (Feenstra, 2002; Long, 2017). The goals of community food systems are to create a system, process, and infrastructure in which food travels, while also contributing to essential community capitals, including areas of policy, equity, economy, wellness, environmental stewardship, built infrastructure, and education (Feenstra, 2002; Campbell, 2004; Long, 2017).

Resilience comes into play for community food systems through the ability to continue, enhance, and transform in the face of shocks or disturbances. For this research, we created a definition for a resilient community food system (RCFS) as the ability for a place-based community food systems to withstand shocks and pressures while maintaining basic structures, processes and functions of and within the supply chain and ensure continued access to food for community residents (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020).

To frame ways that community actors may be connected to a resilient community food system, as well as components beyond just how and where we buy food, we need to consider cognitive choice and values that impact individual engagement across RCFS. Individuals make countless cognitive choices each day which include internal and external dimensions (Furness & Nelson, 2016; Norvdall, 2014). Internal dimensions include values, attitudes, emotions, and intention (Norvdall, 2014). Internal dimensions of values then represent themselves through external practices and behaviours. The internal dimension of values can be understood through a

myriad of ways, relational, instrumental, as well as intrinsic and extrinsic. Values can refer to “a principle associated with a given worldview or cultural context, a preference someone has for a particular state of the world, the importance of something for itself or for others, or a measure” (Pascual, et al., 2017, p. 9). A community’s values system relates to how people, societies, and organizations regulate their behavior (Pascual, et al., 2017). Relational values can include people-to-nature and people-to-people relationships are embedded within the broader human environment (Jones & Tobin, 2018; Shroter, et al., 2020) and showcase the desired relationship between people and nature (Schroter M. , et al., 2020). The instrumental value is the importance a particular element holds when making decisions (Lusk & Briggeman, 2009). Relational values showcase the motivation behind a person’s actions based on their value for a person or thing, which in turn is impacted by instrumental values, or the ability to satisfy that motivation (Jones & Tobin, 2018). For example, when thinking of a community food system, a relational value may be environmental stewardship, therefore, an individual may seek out a product that has an instrumental value of being sustainably produced.

Additional aspects of values include intrinsic and extrinsic factors. Intrinsic values include social contributions and person growth, which relate to relational values as discussed previously, with extrinsic values being concerned with status, appearance and what benefits the self (Furness & Nelson, 2016). These values then show up through external dimensions, or behaviour, which can include where individuals shop, their engagement in community, and their day-to-day actions (Gbadamosi, 2009; Norvdall, 2014).

To further discuss values through a community food systems lens, we will detail a couple of examples, and highlight potential discrepancies and conflicts that can arise. For example, a relational value may include reciprocity and redistribution (Jones & Tobin, 2018), and

understanding how our food gets from the producer to our table. To put that value into action, an individual may seek out farmers markets or direct-to-consumer retail outlets that source local food products as easy avenue to participate and interact with the relational value. However, when the intrinsic value comes into conflict with additional instrumental values such as convenience or affordability which do not connect as well to their relational value of reciprocity, the individual may experience conflict or cognitive dissonance if they choose to go to a convenient grocery store and purchase more affordable foods (Jones & Tobin, 2018).

While individuals can act on their values through participation, food purchases, and general involvement in their community, actions and values do not always align. The disconnect between a person's choice and value is known as cognitive dissonance (Ong, Frewer, & Chan, 2017; Gbadamosi, 2009). Cognitive dissonance is the actual psychological stress that is created when there are two or more inconsistent values or cognitions, and individuals feel tension and discomfort due to the conflicting values (Ong, Frewer, & Chan, 2017). While this chapter does not solely focus on cognitive dissonance, there are components of cognitive dissonance that explain how values can compete with one another and impact behaviours of community actors who typically advocate for local food systems.

Determining Community and Individual Values

To frame the discussion of values within resilient community food systems, we reviewed the following frameworks: community capitals framework (CCF), the intergovernmental science-policy platform on biodiversity and ecosystem services (IPBES), and adaptive capacity for an understanding of community-based values. These frameworks were chosen because of their close relation and use in understanding values, interconnections between individuals and community, quality of life, and resilience.

The (IPBES) assesses four dimensions for quality of life: 1) security and sovereignty, 2) health, 3) equity and justice, and 4) heritage, identity and stewardship (Schroter M. , et al., 2020). The Community Capitals Framework (CCF) utilizes seven capitals (built, natural, cultural, financial, social, human, and political) to understand the pieces of a whole within a community. The CCF can be used to understand the whole community, based on capitals, or assets. While not a community development framework, the final concept of adaptive capacity was reviewed based on its connection to resilience and response. Adaptive capacity (AC) refers to the way a community or group can manage resilience and the ability for self-organization to respond to vulnerability and change (Furness & Nelson, 2016; Walker, et al., 2006). Unlike IPBES and Community Capitals, there are not regularly assigned indicators for this process, rather, literature connects to areas like Community Capitals to inform the necessary needs for adaptability (Brand & Jax, 2007; Furness & Nelson, 2016; Walker, et al., 2006).

The following section highlights interconnections across the frameworks. Security and sovereignty incorporate the relationship with food, water and energy and the ability to access, availability, and stability of resources (Schroter M. , et al., 2020). Due to the intersectional components that support creating access, availability, and stability, this is viewed to address all areas of community capitals: built, natural, cultural, financial, social, human, and political. Each of the indicators of security and sovereignty and community capitals are intertwined (Flora & Flora, Rural Communities, 2008). This area is also connected to adaptive capacity because there is need for organizations, individuals, and community to work together for adapting and responding to change (Freitag, Abramson, Chalana, & Dixon, 2015).

The health category of IPBES, includes relationship with the natural environment as well as human health, which can include western medicine and traditional knowledge (Schroter M. ,

et al., 2020). The most distinct community capitals that connect are natural, human, and financial capitals. Natural detailing the connection with environmental care; human capital due to the connection to individual health, education, and understanding of wellness for individuals; and financial because of the need for paying for services to achieve health. Cultural capital may also be a strong connection in this category due to the traditional knowledge and cultural practices that are engaged. Within adaptive capacity, health is an undercurrent to adapting and achieving equilibrium (Freitag, Abramson, Chalana, & Dixon, 2015).

Equity and justice display the relationship between individuals and their access to resources across all capitals, whether care for the environment, allocations of resources, or involvement in decision making. Generally, these crosscut areas of adaptive capacity as well, because of the desire for equitable distribution of resources, power, and decision making. Equity and justice are inclusive of individual's rights. Most notably, this would connect to social, human, cultural and political capital. Social due to the ability for groups and networks to share understanding and support for equity and justice; human because of individual values and responsibilities related to a particular cause; cultural to represent the difference and unique aspects of a place; and political for informing policies that may support more equitable distribution and creating justice (Flora & Flora, 2008).

Heritage, identity, and stewardship are directly connected to individual and social identify of a place (Schroter M. , et al., 2020). Directly, this relates to human and social capital and the care for natural and cultural systems for understanding the history of a place. Similarly, this connects to adaptive capacity for understanding the history and previous conditions, as well as the goals for the future (Furness & Nelson, 2016).

These frameworks were used to understand the breadth of community values and frameworks to assess community for capitals and quality of life. Next, we reviewed Schwartz to further refine specific values of individuals, related to the concepts from community frameworks. Schwartz developed a theoretical model for motivational value types, including areas related to openness to change, self-transcendence, conservation, and self-enhancement (Schwartz, 2012).

To operationalize into value systems, Table 3-21 was developed to showcase potential connection to community-based relational values and that of individual relational values. The community attributes from IPBES, CCF and adaptive capacity frameworks most closely related to individual values and behaviors such as success, achievement, power, and conformity from Schwartz. Additional areas that Schwartz discusses, such as self-enhancement did not align closely with the attributes discussed within IPBES, CCF and adaptive capacity (Schwartz, 2012). It should be noted that adaptive capacity is not captured in Table 3-1, because the ability for adaptation is intrinsically connected in each framework as detailed in the narrative.

Table 3-1: Table Developed to show potential values associated with IPBES and Community Capitals Framework

IPBES (Schroter M. , et al., 2020)	Community Capitals (Flora & Flora, Rural Communities, 2008)	Values (Schwartz, 2012)
Security and sovereignty	Built, Natural, Cultural, Financial, Social, Human, and Political	education, knowledge, heritage, stewardship, security, partnership, and benevolence, sense of gratification, safety, stability, universalism, understanding, welfare
Health	Natural, Human, and Financial	culture, heritage, future generations, health, wealth, individualism, education, stimulation, sense of gratification, benevolence
Equity and justice	Built, Natural, Cultural, Financial, Social, Human, and Political	future generations, diversity, community ownership, partnership, support, culture, trust, and accountability, benevolence, perseverance, helpful, honest, responsible, loyal, universalism, appreciation, tolerance, wisdom
Heritage, identity, and stewardship	Human, Social, Natural, Cultural	environment, future generations, culture, stewardship, benevolence, fairness, trust, and support, individualism, tradition, respect, commitment

Food values

In addition to relational values and what drives participation and interest, extensive research has been conducted on consumer buying patterns (Cairns & Johnston, 2018;

Gbadamosi, 2009; Papaoikonomou & Ginieis, 2017). However, the connection between personal values and relational values have not been assessed in depth, because many studies stop at the juncture of discerning what motivates an individual to make a food buying decision (branding, discounts, materials, etc.) (Gbadamosi, 2009). Food purchases connects to the relational and extrinsic values mentioned previously and have additional attributes that consumers look for when making food buying decisions. An extensive literature review by Lusk and Briggeman detailed eleven common food attributes:

Table 3-2: Food Purchasing Attributes

<i>Attribute</i>	<i>Definition</i>
<i>Naturalness</i>	Extent to which food is produced without modern technologies
<i>Taste</i>	Extent to which consumption of the food is appealing to the senses
<i>Price</i>	Price that is paid for the food
<i>Safety</i>	Extent to which consumption of food will not cause illness
<i>Convenience</i>	Ease with which food is cooked and/or consumed
<i>Nutrition</i>	Amount and type of fat, protein, vitamins, etc.
<i>Tradition</i>	Preserving traditional consumption patterns
<i>Origin</i>	Where the agricultural commodities were grown
<i>Fairness</i>	Extent to which all parties involved in the production of the food equally benefit
<i>Appearance</i>	Extent to which food looks appealing
<i>Environmental Impact</i>	Effect of food production on the environment

Source: Adapted from the Food Attribute Considerations (Lusk & Briggeman, 2009)

To further understand the complex interconnections between community food systems, personal and relational values, as well as dynamic options for food attributes and buying decisions, a five case-study, mixed-methods approach was developed. The following section reviews the methods, analysis, and results.

Methods

As stated above, this research assessed IPBES, CCF and adaptive capacity, as well as individual value literature to identify common themes. Research was conducted in five place-based communities across the U.S between 2020-2022. Each case study was identified based on interest in community food systems and resilience. This mixed-methods approach includes a

light connection to grounded theory and incorporates an iterative process (Hesse-Biber, 2010) with appreciative inquiry interviews, participatory-based foresight focus groups (Patton et al., 2015; Hebinck et al., 2018; Himanen et al., 2016; Ruhf et al., 2017), followed by individual surveys to assess individual values. Non-probability sampling through convenience and networks were used, including snow-ball interviews and network listservs for survey participation (Baker, et al., 2013). Data analysis was aimed to develop theory through an iterative process, leading to data acquisition guiding the next steps. This chapter received IRB Approval, IRB 20-471, in 12/23/2020 (see Appendix C).

Table 3-3 details the community, partner organizations, disaster type, and research participation. Table 3-4 details demographic information for cumulative survey participants.

Table 3-3: Community Participation in RCFS research

COMMUNITY	PLACE-BASED COMMUNITY	PARTNER ORGANIZATION	DISASTER AND COVID-19	RESEARCH PARTICIPATION
ALASKA	Rural: Kenai Peninsula	University of Alaska Extension and Outreach, Alaska Food Policy Council and Homer Soil and Water	Swan Lake Fire- 2019 Additional disasters added based on interviews: earthquake, flood, drought, ice, wind, drought)	7 interviews 2 focus groups (6 participants) 35 survey responses, completion rate 1.5%
ARKANSAS	Suburban: Washington and Benton County	University of Arkansas Extension and Outreach	Strong winds and tornado- 2017; additional natural disasters added based on interviews: ice, hail, wind, flood, fire	13 interviews 1 focus group – 6 participants 109 survey responses, completion rate 16%
IOWA	Rural: Marshall County	Iowa State University Extension, Marshall County Extension	Derecho- 2020 and Tornado -2018	19 interviews 2 focus groups – 6 participants 35 survey responses, completion rate 5%
TEXAS	Rural: Bastrop County	Texas Center for Local Food	Lost Pines Fire – 2011; additional disasters added based on interviews: Winter Storm Uri, hail, drought, flood, tornado	17 interviews 5 focus groups- 12 participants 76 survey responses, completion rate 18%
US VIRGIN ISLANDS	Regional: Territory	Virgin Islands Good Food Coalition	Hurricane Irma and Maria – 2017	12 interviews 3 focus groups – 17 participants 18 survey respondents, completion rate 3.8%

Table 3-3 Continued

COMMUNITY	Place-based community	Partner organization	Disaster and COvId-19	Research Participation
TOTAL				68 interviews 13 focus groups: 47 participants 273 survey participants

Table 3-4: Survey participant demographics

SURVEY PARTICIPATION DESCRIPTION					
AGE		EDUCATIONAL ATTAINMENT		GENDER	
25-34	20	High school only	20	Female	193
35-44	33	Associates	20	Male	52
45-54	36	bachelors	90		
55-64	70	Masters	77		
OVER 65	93	PhD or Higher	19		

We first interviewed lead partners and community actors in five place-based communities (Table 3-5). Community actors were identified by connection to community food system sector and community actors. Additionally, during each interview, a snowball question was asked for additional interview participants who had experience working within the area of resilience, community food systems, or community development. To understand how community actor's values and participation impacts community food systems, appreciative inquiry interviews and individual surveys were utilized to assess values and interest in community food systems. The interview questions started at a broad community perspective of assets and limitations related to CFS and CCF, and then homed in on more specific questions (Gaffey, 2013). Due to COVID-19 and the inability to travel, interviews were held virtually, via zoom or phone. The interviews were set up to be conversational, but also included guided questions to cover the breadth of topics. Each interview lasted between 30-60 minutes.

Table 3-5: Community Actor Interview Types

Community Food Systems	Community Actors interviewed
Cultivation and Harvesting	Gardeners and homesteaders, farmers, fishers, hunters
Processing and Transformation	At home food processors, shared-use kitchen managers, value-added business creators, and processing facility managers
Distribution and Marketing	Community Supported Agriculture business owners; food box and food hub managers, farmers market managers, grocery store managers, school dining and nutrition directors, and food bank managers
Food Access and Consumption	Food pantry and meal program coordinators, college and hospital dining directors, state departments of public health and nutrition, restaurants and food truck owners, Food System Policy Councils and Coalitions
Resource Stewardship	Natural Resource and Conservation district personnel, Department of Natural Resource personnel, Land Trust coordinators; Fishery and Coastal Management coordinators, non-profit organizations working to reduce waste, and gleaning program coordinators
Community Capitals	Community Actor interviewed
Natural Capital	Individuals listed in cultivation and harvesting and resource stewardship, Land-Grant University Campus Faculty & Staff working in areas of agriculture, FEMA staff,
Cultural Capital	Indigenous organization coordinators, Latinx community members, residents, community foundation staff, Land-Grant University Campus Faculty & Staff working in community
Human Capital	Residents, school and college administrators, employers
Social Capital	Residents, city council and elected officials, individuals involved in networks, coalitions and boards, Land-Grant University Campus Faculty & Staff working in community
Political Capital	Elected officials; city, county, and state departments; University staff members; board members for non-profits
Financial Capital	Bank staff, economic development authority personnel, lending organization staff, business owners
Built Capital	All individuals within community food systems; City, county, and state departments;

First, participants were asked about their organization and role. Following, open-ended questions were asked relating to community assets and limitations, which then led into specific questions about community food systems and extent of engagement and development. Prompts within this included request about the types of food products produced, food value chain, and perceptions of involvement in the community food system, which may include community-based development for community food systems, whether that be through local food marketing campaigns, coalitions, or generally interest from individuals.

The data collected was coded through NVivo for each interview with specific categories related to community capitals, values, and community food systems. We utilized codes to determine follow up focus groups questions, which include foresight questions for disaster response. After focus groups, additional coding occurred, and then appropriate questions for an

individual survey was developed. The survey was distributed through listservs sent from the identified community partner. The survey sought to further investigate individual values, individual participation in their community, perceived importance of community food system components, and food purchasing habits (See Appendix A and B for interview guide and survey questionnaire).

As discussed in the previous section, countless relational values connect to resilient community food systems. Within interviews and focus groups, questions relating to community values and assets were discussed. Then, based on qualitative coding, a set of eleven relational values and eight indicators for participation were selected for the survey. The survey then focused on questions related to individual's values and participation in the community. Each participant was asked to select their top three values out of a pre-assigned list, and "select all that apply" from a participation list (See Table 3-6).

Table 3-6: Values and Community Participation included in survey

Values		Participation Activities
Accountability	Financial growth	<ul style="list-style-type: none"> • Build relationships with neighbors and people in my community • Own, manage or work for a local business/ organization • Participate in seasonal celebrations • Purchase from local businesses • Understand our heritage and history • Utilize public community assets (parks, libraries, etc.) • Volunteering • Vote in local elections
Benevolence	Future Generations	
Community	Generosity	
Ownership	Heritage	
Conformity	Individualism	
Culture	Partnership	
Diversity	Security	
Education	Trust	
Environment	Wealth	

To understand important food attributes for at home-purchases, individuals were first asked about the importance of supporting local food and farm businesses, on a scale of 1 to 5, with five being extremely important and one being not at all important. Following this question, individuals were asked to indicate where they shopped for food with a pre-aggregated list of locations. Then, they were asked to state the level of importance from a pre-determined list of

food attributes. Like relational values, food attribute values started with a list of eleven attributes (as discussed in the previous section) but were minimized to eight indicators for the survey based on findings from interviews. The eight attributes within the survey included: affordability, convenience, food safety, freshness, grown local location, organic, and relationship with producer or grower.

Analysis

This multi-faceted approach across five communities allowed for triangulation of data and analysis both within and across the cases. Interviews allowed for improved understanding of community values and existing conditions, scope, and relevance of the community food system. The survey provided a quantitative approach to understanding individual values and behaviors related to involvement in the community food system.

Qualitative data included transcripts from interviews, focus groups, and field notes, which were analyzed through NVivo for coding. Themes were initially identified from interviews. Following, focus groups were coded, which resulted in additional sub-categories.

Quantitative data was analyzed in Excel to compare responses from individuals across and within communities. To analyze findings for gender, age, and education, the data was only interpreted when a group had at least 13 participants or more (5% of the sample). For example, when looking at values and gender, analysis was only completed for male and female. While there were additional responses from “non-binary”, “other”, or prefer not to respond, these individuals didn’t account for 5% of the sample.

When qualitative codes (community assets and values) were compared to quantitative data (individual values), cognitive dissonance, and the tension of believing strongly about the importance of local food, but not participating in the food system or buying from local farm and food businesses was apparent. The following section further discusses these results and details

patterns across communities, as well as specific traits of individuals related to their participation in community food systems.

Prior to discussing results, it should be noted that there was extensive qualitative research conducted across interviews and focus groups. This allowed for significant contribution to understanding the effectiveness and perspectives of individuals and organizations engaged in the community food system, and their perceptions of CCF and CFS. However, the quantitative data collected does not represent statistical significance and is not generalizable for each community, but still represents insights and signals for the research.

Surveys were shared out through listservs from partner organizations and did not garner significant responses. This could be due to fatigue of surveys and research during COVID-19 or may generally show a lack of interest in the subject. In either case, respondents were from listservs of organizations that are involved in food systems work, and findings may be skewed based on the population that received the survey. Therefore, in addition to comparing findings across community, we will also discuss findings across gender, education level, and age. Within the discussion, figures are not shown for gender, education level, and age, but details can be found in Appendices D-F.

Results

Community Capitals, Individual Values, and Participation

As discussed previously, there is connection across all community capitals, values for quality of life (IPBES assessment) and adaptive capacity. Our findings show that social, cultural, and natural capitals were the most prominent mentioned as assets across the community.

Individuals' values were somewhat different than the perspectives of those interviewed and who participated in focus groups. The two common values for individuals were environment and

education. Education was the most consistent value, with an average agreement between 35% and 45% across case studies.

Based on the community capitals and assets identified in qualitative research, we may have assumed that individuals would have values, and participation behavior that related to described assets in interviews and focus groups. For example, social capital could relate to community ownership and trust as an individual value and also developing relationships; or human capital could relate to education as an individual value and understanding history and heritage. However, in most cases (see Table 3-7) community capitals, individual values, and participation were not aligned across the community.

Table 3-7: Comparison of community values by community capitals and individual values

Community	Community Capitals	Individual Values	Participation
<i>Kenai Peninsula, Alaska</i>	Social, Human, Culture, Natural	Environment, Education, Future Generation	Purchase from local businesses, vote, develop relationships
<i>Benton and Washington County, Arkansas</i>	Financial, Cultural Natural, Social	Environment, Education, Trust	Purchase from local businesses, vote, volunteer
<i>Marshall County, Iowa</i>	Culture, Social, Financial	Education, Community Ownership, Trust	Purchase from local businesses, vote, participate in seasonal celebrations
<i>Bastrop County, Texas</i>	Culture, Built, Social	Education, Diversity and Environment	Vote, purchase from local businesses, develop relationships
<i>Territory of the Virgin Islands</i>	Human, Social, Natural	Environment, Culture, Education	Purchase from local businesses, vote, develop relationships, understand history and heritage, volunteer

Community Capitals

When assessing the case studies, social was the only common capital representing as an asset. Cultural capital was identified in four of the case studies, and natural capital was identified in three of the case studies. Social capital came through strongly with discussions around networks, relationship development and trust. Regarding cultural and natural capital, individuals spoke to the positive assets of being able to access natural amenities, knowledge, and wisdom of individuals in their community, and understanding cultural heritage and diversity. However, while these capitals were discussed as assets, the opposite was also true with interviews

highlighting limitations in these areas. For example, natural capital, while recognized as an asset, also revealed concerns and the need to protect public spaces due to urban sprawl, construction, and increased population and housing that may cause damage to waterways, hunting ground, and agricultural land. Individuals also, while realizing the importance of cultural, racial, and ethnic diversity, also shared concerns around racism and bias in their community.

Natural capital was a common community capital asset within Alaska, Virgin Islands and Arkansas. In Alaska, individuals spoke about their natural assets in relation to public lands and agriculture. One individual in Alaska shared, “we are blessed to have a lot of public land and wild land on the peninsula,” and relating to agriculture, one participant stated, “[we have] tremendous growth in the number of farms and value-added producers that are popping up...it’s also beautiful here, [I] couldn’t think of another place to live.” The Virgin Islands had social and human capitals as the strongest capitals in their community, with natural capital a close third as a strength and asset. One interviewee in the Virgin Islands shared that, “the views, the beaches...these things are priceless”, and another shared, “[I] believe we have some of the best waters and fisheries.” Similar to the Virgin Islands, Arkansas had two capitals, financial and cultural, that ranked higher than natural capital, however, when asked about natural capital, individuals shared that they appreciated the natural amenities such as trails, parks, and mountains as well as organizations like land trusts that are protecting the environment.

Human, financial and built capitals were mentioned across all communities as both limitations and strengths. For example, financial capital was seen as a strength in Marshall County, Iowa and Benton and Washington County, Arkansas. This may be due to the prominent involvement of foundations, like Walton Foundation, in Arkansas, as well as the high rate of volunteerism and donations mentioned in Iowa. While there were strengths in this area shared,

there were also discussions around need for further development and financial resources for increasing community food system infrastructure. Built capital had similar juxtaposition, in that it was recognized as a need, but was discussed regarding challenges for distribution, or community sprawl and development.

Values

Individual values from the community at large were somewhat different than the perspectives of those interviews. The two common values across each case study were environment and education (Figure 3-1). Education was the most consistent value, with an

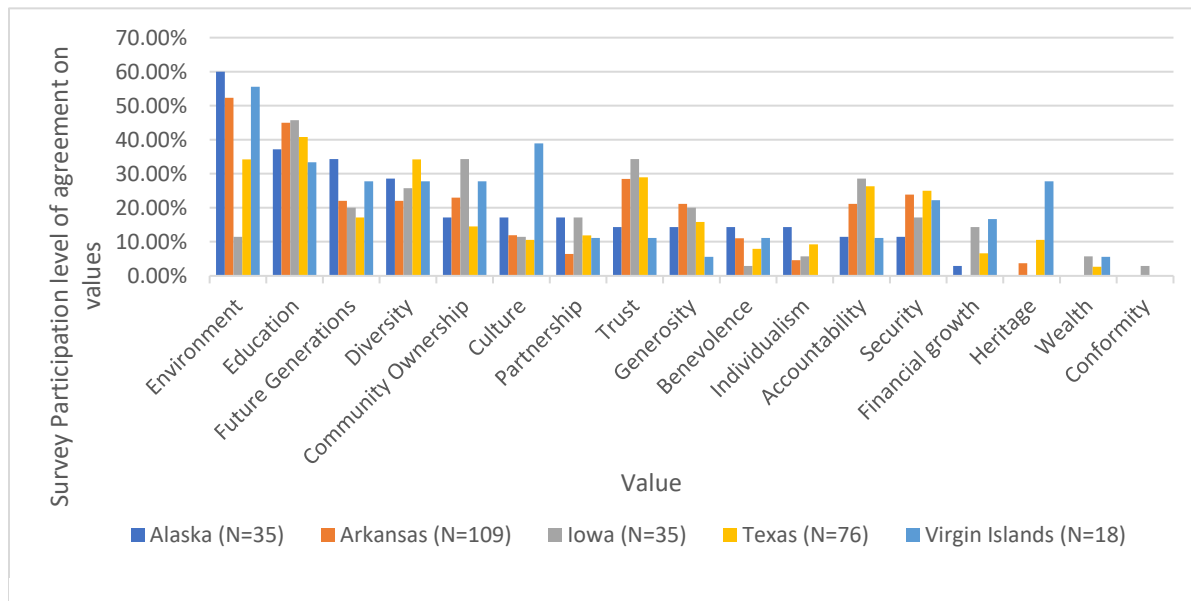


Figure 3-1: Individual values represented by community

average agreement between 35% and 45% across case studies. This shows the importance of human capital and the ability for individuals to learn and develop new perspectives. However, human capital and knowledge or education, didn't appear strongly when asking about community assets. One potential is that education is a more personal and intrinsic value, rather than a relational value that individuals think of when considering their community (Jones & Tobin, 2018; Schroter M. , et al., 2020). Another way to think about this is when considering

one's own values for their self, education could be more quickly thought of in a survey context, compared to when asked about values and assets of a community.

The value of environment had the largest difference in level of importance. All communities except Iowa had environment ranking as one of the top two values, Marshall County, Iowa viewed environment as one of its lowest values, ranking 11th in importance. This was also expressed through interviews when comparing community capitals. While natural capital didn't show as the highest capital in communities, it was among the top three for three of the five communities. Natural capital also was seen as a limitation and concern in addition to an asset. Many individuals shared concerns over production practices, specifically related to care for the land and large-scale commodity production such as corn, soybeans, and livestock. For example, Bastrop County, Texas saw environment as critical value, ranking it as the second highest value to education. Within Bastrop, the importance of the environment was frequently discussed regarding the protection of agricultural land and natural amenities from urban sprawl and development. For example, one participant shared, "[we] have the richest soil in Texas, [but we're] losing it faster because of development, [I] worry about losing the soil and not having a crop." Following education, and environment for four case studies, values for individuals vary ranging from future generations, trust, environment, and community ownership (see Table 3-7 and Figure 3-1).

Individual values also differed by the gender, age, and educational attainment of respondents. When aggregated based on educational attainment, environment was still the highest value for most, except for those with "high school only" or an associate degree, who viewed accountability and community ownership as more significant values. Respondents with associate degrees still viewed environment as important, with around 75% agreement of

environment being a top value, however, education was viewed as a more important value, with 80% agreement. When reviewed by gender, women viewed environment as their highest value, followed by education and diversity. Where men viewed community ownership, education and accountability or future generations as their top values. When reviewed by age, environment and education were relatively agreed upon for the top values. Valuing future generations showed a large separation between age groups, with only 5% of 25-34 age group and almost 26% of 35-44 having this as a value. The next disparity occurred with partnership: 25-34 had 35% agreeing on a top value and over 65 only had about 5% (see Appendix D-F for attributes by age, education level, and gender).

Participation

We also inquired about participation in community (see Table 3-7 and Figure 3-2). Alaska was the only community that had 100% of its respondents share that they participated in an activity identified as benefitting the community- purchasing from local food businesses. Virgin Islands had lower participation in most categories (with their highest participation value being 83% of respondents for purchasing from local businesses). During interviews in the Virgin Islands, we heard of lack of engagement of the community as well as stories of people moving to the “states.” One individual shared, “[we] have a significant brain drain issue- curious if people who come home temporarily end up staying [in the U.S. Virgin Islands.]” Another individual interviewed stated, “[things are] so far behind and [it’s] scary – depressing—for me; its dehumanizing because it has been about building capacity and working with young people.” These discussions showed an extent of lack of capacity, or potential interest in engaging in this type of research, as well as community efforts like voting and broader engagement efforts. In addition, participation in the survey itself was also extremely low in Virgin Islands. However, in

areas of understanding history and heritage, Virgin Islands had the second highest participation (72%), ranking close to Alaska (77%).

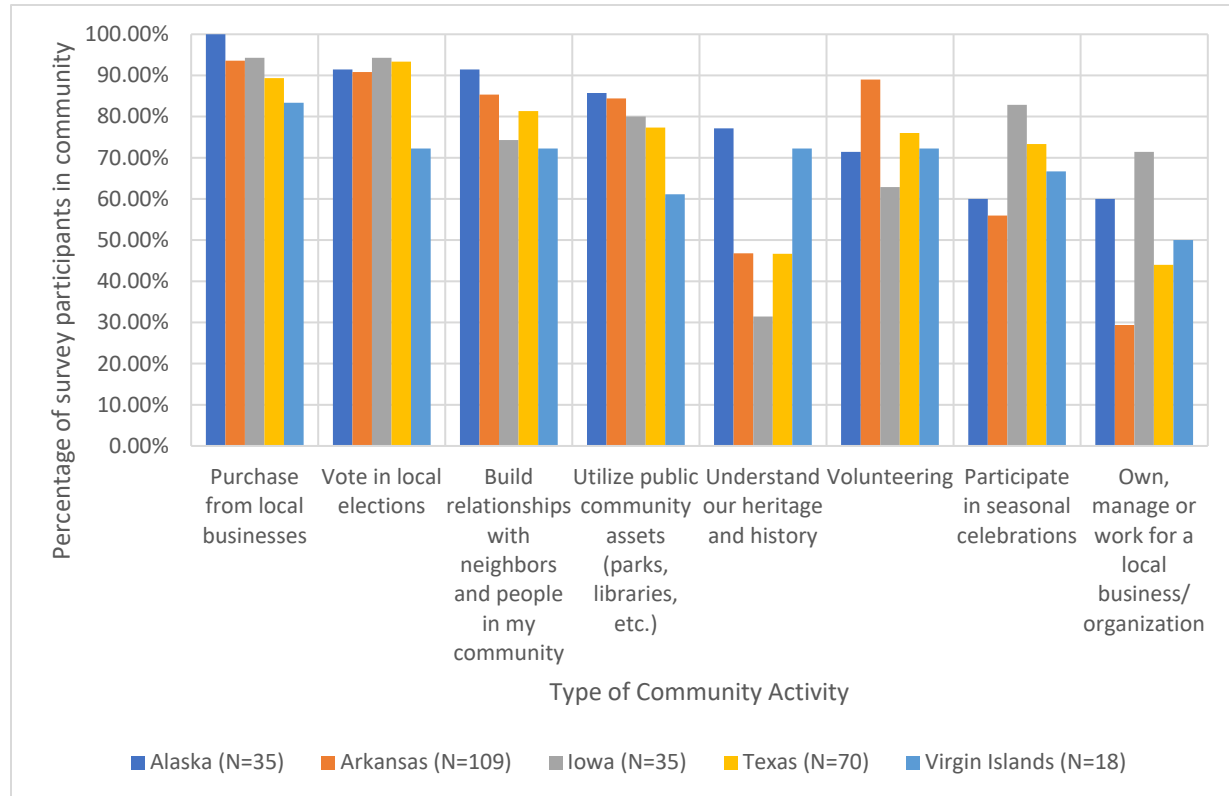


Figure 3-2: Community Participation, by case study

The participation table, when compared to values and community capital interviews, show potential individual hypocrisy or misperception of activity (Ong, Frewer, & Chan, 2017). Hypocrisy in this case referring to an internal feeling that occurs when an individual has made a public statement about a value, and then is unable to follow through with that statement in their actions. For example, Marshall County, Iowa, during interviews talked about financial capital and volunteerism or donations, however, when compared to individual survey responses, volunteerism was the lowest in Iowa, with only 62% stating they volunteered. Another example of discrepancy is the high value of cultural capital stated in interviews, but the survey had very

little understanding of heritage and history of the community (Arkansas (47%), Texas (47%), and Iowa (31%)).

Education achievement contributed to different participation levels. Voting and purchasing from local businesses were very closely related, with only a 5% difference across different educational attainment. Owning, working, or managing a local business were the next closest participation level, but differed 20% between masters' earners (49%) and high school only (30%). The most significant difference occurred in the areas of volunteering, participating in seasonal celebrations, and understanding the heritage of the community. Individuals with a PhD or higher (~95%) were more likely to volunteer than those with only high school education (55%). Similarly, individuals with a PhD were more likely to understand the history and heritage of their community (~74%) compared to those with only a high school degree (35%). However, other individuals were still only about 50% likely to understand the history and heritage of their community, showing that this was not a common participatory activity, falling second to the last compared to owning, working, or managing a local business. The final category with the most difference across education attainment was participating in seasonal activities. This category shows a shift, where individuals with an associate degree were the most likely to participate (80%) followed by bachelors, high school only, and masters with about 65% on average, and then those that earned a PhD (47%).

Female and male participation in community activities is more similar than their perspectives on values. Only two categories differ by more than 10%. Utilizing public community amenities, such as libraries, parks, etc. females are more likely (about 84%) than men (about 65%) to use these amenities. Owning, working, or managing a local business also shows a

slight difference, with men being more likely (about 52%) than women (about 42%) to own, manage or work for a local business.

Like gender, age didn't show as much discrepancy in participation. Most categories ranged between 10-15% difference among age groups. The most significant difference in participation occurred between owning, working, or managing a local businesses, volunteering, and understating heritage. For each category, the biggest difference occurred between the youngest and oldest age groups. Volunteering saw a general decline in participation the younger the age group, whereas owning, working, or managing a local business saw a general incline the younger the generation, except for the age group 45-54. Understanding heritage and history had about 50% of all age groups participating in this knowledge gathering, except for the youngest age group where only 25% participate in this activity.

Supporting Farm and Food Businesses and Food purchasing

When participants were asked about their food buying decisions, overall, we saw a high level of perceived importance for local food and farm businesses. All case studies ranked support for local food and farm businesses as very important. Iowa ranked the lowest in comparison, with a 4.23 out of 5, and Alaska ranked the highest, 4.63 out of 5. Among all case studies, except Alaska and Iowa, communities had scores ranking from slightly important to extremely important. Alaska and Iowa only had rankings in moderately important to extremely important (see Figure 3-3).

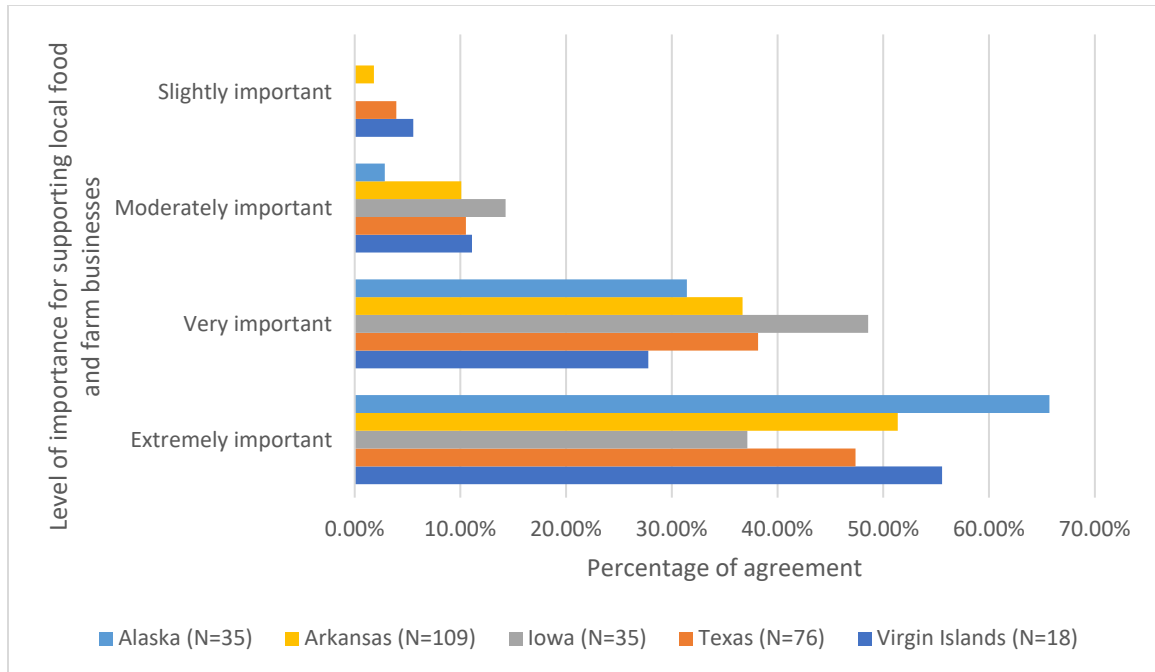


Figure 3-3: Individuals perception of the level of importance of supporting local food and farm businesses, by community

When asked about the attributes that were most important when purchasing food, fresh, grown local, and affordability were seen as the most important attributes across communities (See Table 3-8). These were ranked on a level of 1-5 with 1 being not at all important and 5 being extremely important. The fresh category garnered an overall average of very important (4.23), while grown local (3.87) and affordability (3.85) were seen as a high moderate important category, like that of food safety practices, and convenience.

Table 3-8: Important considerations for buying food (ranked on a level of 1-5 with 1 being not at all important and 5 being extremely important)

	Alaska	Arkansas	Iowa	Texas	Virgin Islands	Total Average Importance
<i>Fresh</i>	4.29	4.31	3.86	4.35	4.39	4.24
<i>Grown Local</i>	4.37	3.85	3.46	3.60	4.06	3.87
<i>Affordability</i>	3.80	3.62	3.89	3.79	4.18	3.85
<i>Food Safety Practices</i>	3.44	3.58	3.66	4.50	3.72	3.78
<i>Convenience</i>	3.49	3.62	3.71	3.67	3.72	3.64

Table 3-8 Continued

	Alaska	Arkansas	Iowa	Texas	Virgin Islands	Total Average Importance
<i>Location</i>	3.54	3.50	3.46	3.79	3.11	3.48
<i>Relationship with producer, seller, etc.</i>	3.49	2.76	2.79	3.16	2.94	3.03
<i>Organic</i>	3.34	2.77	2.24	3.03	3.00	2.88

Interestingly, while participants shared that supporting local food and farm businesses was very important, having a direct relationship with the producer was seen to be slightly or moderately important. In many cases, the relationship with the producer or grower, was the lowest ranked importance attribute, along with organic grown products. This begins to show the discrepancy in food values. From this research, it is evident that knowing the food is grown local is of more importance than having a relationship with the producer themselves. Additionally, these findings show again the potential cognitive dissonance when individuals are faced with multiple criteria to choose from when making food buying decisions.

Alaska (4.37) and Virgin Islands (4.06) had the highest percentage of individuals who claimed that grown local was very important when making food purchasing decisions. Alaska was the only community that saw grown local as the most important attribute compared to all other communities. Alaska is constant between the level of importance of support for local farm and food businesses, and their perceived buying habits. Arkansas only ranked one other attribute, freshness (3.85), as more important than grown local, which shows similar relational value and consistency to their importance of local food and farm businesses. Virgin Islands had two indicators that were determined to be more importance than grown local, freshness (4.39) and affordability (4.18). Iowa had four attributes with more importance than grown local: freshness (3.86), affordability (3.89), convenience (3.71), and food safety (3.66). Texas had five attributes with more importance than grown local: food safety (4.50), freshness (4.35), affordability (3.79), location (3.79), and convenience (3.67). As the number of attributes with higher value than local

food rise, there will be more opportunities for individuals to have conflicting values and potential for cognitive dissonance, especially if they also believe that local food and farm businesses are very important for their community.

When comparing across areas of gender, age and educational attainment, educational attainment showed the most difference in importance of food buying attributes, with six of the attributes having over a 10% difference. The largest difference was “having a relationship with the producer.” While each group saw having a relationship with the producer as slightly to moderately important, associate’s earners saw this as the highest importance (3.1) and PhD or higher only saw this as a low slightly important attribute (2.42). The next attribute with the most difference was organic, with all viewing the category within slightly important. Master’s degree earners saw this as a high slightly important category (2.96) and high school educated individuals saw it as a low slightly important category (2.3).

An irony shown through this survey was that respondents with PhD ranked the importance of supporting local food and farm businesses as the highest, with an average of 4.53, however, when asked about the attributes important in their food purchasing decisions, they rank the importance of having a relationship with that farmer or seller as only the lowest across all, with a 2.42, but the actual practice of the product being grown local among the highest at a 4. This shows one example of differentiation in values. That valuing the local product does not necessarily mean the act of connecting with the farmer, grower, or business owner, but rather, the act of buying local being the value.

Fresh was the only attribute that received a score of very important across both men and women, with women ranking the attribute as a 4.3 and men ranking at a 4.21. All other attributes fell below a “very important” and above a “slightly important.” All attributes except “grown

local” and “organic” were aligned. Women saw local products as a more important attribute than men, ranking it as a 3.9 compared to a 3.5; and women also saw organic as more important than men, ranking it as a 2.92 compared to a 2.42.

All attributes within age had similar results. The only attribute that had a difference of more than 10% between age groups was the importance of affordability. Where the age group (35-44) ranked this as very important (4.09), and the oldest age group (over 65) ranked as only moderately important (3.49) (see Appendix D-F for attributes by age, education level, and gender).

Discussion

While it is not meant to state that any of these attributes are right or wrong, the aspect that is of particular interest is that individuals are inclined to state their belief that supporting local food and farm businesses is important. However, when it comes to purchasing food, values other than locally grown product, are typically seen as more valuable or important. This is a relevant finding to showcase the variable values that intersect and conflict when individuals purchase food and participate in community activities. Individuals may have strong values or belief systems in certain contexts, but in others, they may come into question or be diminished based on another set of values (Ong, Frewer, & Chan, 2017).

From discussion and analysis of the case studies it is evident that values do not always connect to behavior and that individuals, and thus communities, that have competing values and interests may find it difficult to develop a thriving community food system (Norvdall, 2014). As discussed in the literature, we have internal and external dimensions to ourselves (Furness & Nelson, 2016; Norvdall, 2014). Internal dimensions include values, attitudes, emotions, and intention, which may also include the social contributions to society (Norvdall, 2014). The internal dimensions, or values, then show up through external dimensions, or behaviour.

Individuals have relational values that impact their interest in understanding how food gets from the producer to table and general participation or interaction with businesses (Jones & Tobin, 2018). Therefore, values impact where individuals shop, their engagement in community, and day-to-day actions (Gbadamosi, 2009; Norvdall, 2014).

When values and behaviour don't align, the disconnect is known as cognitive dissonance (Ong, Frewer, & Chan, 2017; Gbadamosi, 2009). Cognitive dissonance can cause the feelings of hypocrisy or feeling disloyal to a value. From this research, it is assumed that all individuals may experience cognitive dissonance at some point when they experience conflict with their behaviour and value systems, such as wanting to support local food and farm businesses, but not always choosing to do so (Norvdall, 2014). Community actors can show their values and underlying perceptions of the importance of local food purchasing and attributes through their food purchasing habits and broader community engagement (Carolan, 2016). This includes individual's interest and knowledge about production practices and the overall food system (Cairns & Johnston, 2018). For example, when making decisions on food buying choices, multiple values may compete and cause stress while determining the right decision to make.

Conclusion

This paper is an initial step in understanding the connections of values and resilient community food systems. The aim of this chapter was two-fold, first to assess and analyze the connections between community assets, shown through the community capitals, IPBES, adaptive capacity frameworks, and personal values; and second, to discuss how values correspond to community and individual support of farm and food businesses.

All community capitals are critical for investment, and from this research, social capital is where garnering interest and participation can begin. Cultural, natural, and human capitals are critical to community values and drive decision making around participation in community food

systems and food purchases. Built, financial and political capital are tertiary capitals that need critical investment to enhance the resilience of a community food system and support the systemic practices and improved quality of life, particularly in areas related to affordability, convenience and location or accessibility or products.

This research brings into question whether communities will be able to foster places where citizens are interested and informed about their food system and can act on their personal values. The five case-study communities identified examples of engagement and strong value system for community food systems, however, the research also shows that the broader population participating in the survey did not have the same convictions as those interviewed. Based on the findings, there are numerous barriers that could be causing this juxtaposition, including built infrastructure leading to accessibility constraints; financial capital and affordability concerns; and general interest and awareness of the population. Community food systems are not merely a values-based perspective, but also require participatory action of consumers, including support activities like volunteering, purchasing, and voting for practices related to food and farming (Kleiman, 2013; Clancy, 2017). The research highlighted that values are complex, they change, and at times contradict. Based on the situation we are presented, the context we are in, including who we are with, values will evolve, both individually and as a community.

Additional research is needed to further understand the connection and more explicit reasonings behind cognitive dissonance for community food system involvement. It is suggested that broader community surveys and quantitative analysis be conducted in communities to understand a comprehensive, and statistically significant, questionnaire. For individuals and organizations seeking to increase engagement of their community in food systems, it is important

to understand existing and competing values that may draw someone away from a local food purchase or food system activity. When working within social systems and building local food systems, identifying key pathways to shifting the current dynamic of the system will be an important first step to improve staying power and resilience of the effort. Through this, we advocate for individuals, organizations, and businesses to engage in community food systems, and to foster meaningful relationships and trust between and across areas of work. Through trust and relationships, we will continue to learn from each other and understand the complexity of our community food systems.

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Appendix A: Interview Guide

Review of Interview

The purpose of this study is to better understand resilient community food systems and how communities can withstand different kinds of shocks arising from [natural disaster] and COVID-19; better understand how land-grant universities can support community resilience and strengthen food systems; and assess the level of community awareness and support for community-based food businesses.

This interview is conducted to understand how farm and food businesses, government agencies, and land-grant universities work in community food systems. This includes understanding perspectives on community, food systems and resilience as well as response to [natural disaster] and COVID-19. Interviews will ask questions to understand how the food system is impacted by disaster and how community members have begun to strategize on recovery and rebuilding.

This study is funded by the Agriculture Marketing Resource Center, which is a national information resource for value-added producers and is funded through the Farm Bill and hosted through Iowa State University.

Informed Consent and Demographic information

Interview Guide

We're going to start by discussing community. Community can mean many different things. Some may think of communities in terms of how people are connected to each other through similar interests to share and discuss topics of common interest- these can be both in person or virtual (like listservs or networks). Some think of communities in terms of places where people live, work, and play. Place-based communities may include neighbors, coworkers, or community residents. Today, I'd like to know more about your community...the place where you live that connects you to neighbors, businesses, friends, church members, and co-workers.

1. To start us off, would you mind telling me about your [business/ organization/ agency]?
 - a. Size of business
 - b. Location of operation
 - c. How long have you been in business?
 - d. What does a typical day look like {for you} or {where you work}?
2. Can you describe the [community] you work in? What's it like.
 - a. What are the best things about [community]? What are the worst things? What does the future look like for [community]?
 - b. What's unique about [community]?
 - c. How would you describe your community to someone else?

Now that we've understood some of the context of your community, I'd like to understand more about the community food systems and your perspectives of involvement in that system. Food Systems are connected at many different levels: There are global food supply chains, national food systems, and regional and community-based food systems that influence the way we interact, do business, and purchase food in our daily lives. I am particularly interested in the community food system and ways of purchasing from local farmers; investing in networks or regional groups; advocacy; awareness of accessibility and affordability of foods; etc.

For the following questions, I'd like you to consider your [business/ agency/ organization] interactions.

3. Tell me about the food system in [community]. Can you describe the food system in which you operate?
 - a. What types of food products are you seeing in your local community?
 - b. What is the food supply like in [community]?
 - i. Are there local food producers (fruits/ vegetables/ meat/ dairy/ grain/ etc.)
 - ii. Are products primarily imported from other states/ countries/ etc.
 - c. Are people reliant on farmers markets, grocers, direct to consumer markets?
4. When thinking about your [community] food system, have you seen efforts to increase community-based development for community food systems?
 - a. Is there support for increasing locally produced product?
 - b. Who is supporting these efforts?
 - c. Are you seeing an increase or decrease in interest for community/ local foods?
 - d. Is there an intention among members of the community to support community or local products?
 - e. How would you describe awareness of local and regional food supply?

Next, I'd like to discuss how [natural disaster] and [COVID-19] have affected your community food system, and your [business/ organization/ agency]. We are going to start with questions relating to COVID-19.

5. How did you respond to impacts of COVID-19?
 - a. Did supply and demand change?
 - b. Did production capacity shift?
 - c. Were you responding to different questions or clients?
 - d. Were there policy shifts or regulations needed?
6. In what ways did your [business/ organization/ agency] feel supported by your community in response to COVID-19? If so, how?

Homes- cost of living/ cost of real estate/ depressed salaries--

- a. How did families, businesses, organizations help each other?
 - i. How did land-grant universities and Extension support efforts to respond?
 - b. Were there joint grants, loans, etc. applied for?
7. Where do you think you are on the road to recovery or rebuilding from COVID-19?
 - a. Realizing this is a recent pandemic, do you feel you've been able to get back to "normal"
 - b. What does the future look like for your [business/org] and has COVID-19 brought with it any permanent or fundamental changes to how your organization operates?
8. What kinds of measures, if any, has your [organization/ business/agency] taken to respond to impacts of COVID-19?

Thank you for sharing. I am also curious about [natural disaster] of [year]. Were you living in [community] at that time that [natural disaster] happened?

9. How did you respond to impacts of [natural disaster].
 - a. In what ways was your [business/ organization/ agency] was impacted?
 - b. How did it effect supply and demand change?
 - c. Did your production capacity shift?
 - d. Did you see a change in questions or clients, and if so, how?
 - e. Were there policy shifts or regulations needed?
10. In what ways did you [business/ organization/ agency] receive support from your community like following the [natural disaster]?
 - a. How did families, businesses, organizations help each other?
 - i. How did land-grant universities and Extension support efforts to respond?
 - b. Were there joint grants, loans, etc. applied for?
11. Where do you think you are on the road to recovery or rebuilding from [natural disaster]?
 - a. With 100% being back to normal, what percent do you feel you have grown back since [natural disaster]
 - b. What challenges have you faced as you have begun to rebuild?
 - c. How would you describe operations now relative to what things were like before [natural disaster]? How do things compare to 'normal operations'?
 - d. What does the customer situation look like? Are customers lining up again? Has the customer base changed and if so, how?

Thank you for sharing your experience. As you think about your [community] food system, what are you most excited about moving forward and why?

My last few questions are in relation to logistics for the following steps of research.

Snowball:

Who do you believe is the most influential/active/ etc. person regarding food, health, or community development in [community] is?

If don't have contact- ask for connection.

Focus Group:

Would you be interested in participating in a focus group this [spring]? (yes/no)

If yes, keep contact for sharing about focus group. Share dates.

Survey:

Are you willing to share a survey with your listserv, or the general public related to perceptions and behavior within the community food system? (yes/no)

If yes, get email address, and request information on number of individuals in listserv.

Appendix B: Survey Questionnaire

Review of Study:

The purpose of this study is to understand dimensions of a resilient community food system and ability for communities to withstand sudden, intermittent and long-term shocks in Washington and Benton County - related to COVID-19 and the 2017 strong winds and flooding.

This survey seeks to understand how consumers make food buying choices as well as how they have been impacted by COVID-19 and the 2017 storms and how that has impacted individual's participation in community for recovery and rebuilding. This survey will take approximately 10 minutes and seeks to understand individuals' perceptions of their community in both being resilient in the face of natural disaster and COVID-19 through understanding the level of participation within community businesses and organizations. The survey is open to all participants within Washington and Benton County in Northwest Arkansas. While you can participate in the whole survey, if you do not live within the designated area determined for the study, your response will be removed prior to analysis.

This study is funded the Agriculture Marketing Resource Center.

Consent Form and Signature Page

You are being invited to participate in this survey because you live within Benton and Washington county and may make food-purchasing decisions as well as be active within community organizations and activities. You should not participate if you are under the age of 18. The survey will take approximately 10 minutes.

There are no risks or discomforts that are foreseeable. However, you will be requested to discuss impacts from COVID-19 and 2017 storms on your business and/or organization. This is not intended to cause any discomfort.

Participating in this study is completely voluntary. You may choose not to take part in the study or to stop participating at any time, for any reason, without penalty or negative consequences. You can skip any questions that you do not wish to answer.

By signing this document, you are agreeing to participate in this study. Please make sure you understand what the study involves before you sign. If you have any questions about the study after you agree to participate, you can contact the research team using the information provided above.

I agree to take part in this study. To sign, please drag your cursor to sign your name.

PAGE BREAK

Survey Guide

Thank you for participating in this survey for [community] food systems.

The following questions are meant to be answered as an individual living in [community]. Please answer to the best of your ability.

Please state your home zip code.

Please state the length of time you've lived within this community.

PAGE BREAK

Community Involvement

As residents, we have opportunities to create change and impact our community through action and participation. Our personal and societal values impact what we are involved with. Please answer the following questions related to your personal perspectives.

Please select three societal values that are important to you. If you would like to share an additional option, please type your response in “other”.

Heritage

Community Ownership

Trust

Culture

Future Generations

Education

Environment

Financial growth

Individualism

Wealth

Partnership

Generosity

Accountability

Diversity

Security

Benevolence

Conformity

Other:

There are many ways to participate and support our local community ranging from shopping local, volunteering, joining community councils or networks, or being a generally engaged and concerned citizen about daily happenings. Please select the activities you are actively engaged in (select all that apply). If you would like to share an additional option, please type your response in “other”.

Volunteer at local organizations

Purchase from local businesses

Build relationships with neighbors and people in my community

Vote in local elections

Participate in seasonal celebrations

Understand our [community] heritage and history

Own, manage or work for local business / organization

Utilize public community assets (parks, libraries, etc.)

Other:

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BUSINESS SUPPORT

Additional way individuals can support community is through purchases. For the following questions, please share your feedback based on your personal purchasing habits.

How important is supporting local farm and food businesses to you? (extremely to not at all important)

Which of the following businesses do you purchase from for home-based food consumption?

Select all that apply. If you would like to share an additional option, please type your response in "other".

Independent grocery store

Department Stores

Grocery/ Super Stores

Specialty food

Local Food cooperative

Boxed meal kits (such as Blue Apron or HelloFresh)

Online (such as Amazon, Thrive Market, etc.)

Farmers markets

Direct from farmer/ fisher/ hunter

Community Supported Agriculture (CSA)

Roadside stands

On-farm stores

Personal garden/farm

None of the above

PAGE Break

Please rank the importance of the following options for your food purchases (extremely important to not at all important). If there are additional options you look for in local food purchases, please fill in "other"

Grown/ made locally

Affordability (price)

Relationship with producer, product developer or seller

Location

Convenience

Organic

Fresh

Good Agriculture Practices

Other:

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[Natural Disaster] and COVID-19

For purposes of this research, we are interested in understanding the ability for individuals this community to withstand shocks such as natural disasters or COVID-19. Please answer the following questions based on your personal experience.

Were you living in [community] during [natural disaster] in [date]?

If yes, move through Natural Disaster block questions; if no, skip to COVID-19

[Natural Disaster]

To what degree have you been able to recover back to initial conditions prior to the event? Please state your recovery on a scale of 1-10, with 1 being, no recovery, and 10 being full recovery.

Scale 1 to 10

Please identify how you were impacted by [natural disaster], select all that apply. If you would like to share an additional option, please type your response in “other”.

Diminished personal health

Diminished family health

Increase in mental stress

Increase in physical stress

Increase in financial pressures due to repairs

Damaged Home/ Land/ etc.

Damaged Business/ Farm/ etc.

Business closure (after [natural disaster])

Loss of essential provisions (water/ food/ shelter/ etc.)

Loss of communications (power/ internet/ etc.)

Other:

Based on your needs for response to [natural disaster], please identify how helpful each organization was in providing resources, support or technical assistance during [natural disaster]: If you would like to add an agency, please fill in “other”. (checkboxes ranging from extremely useful to extremely useless; and NA)

County government

City government

[state] department of agriculture

[state] department of education

[state] department of public health

[University]

[College]

Non-profit organizations

Other:

Please describe any strategies you believe still need to occur within [community] to fully recover from [natural disaster].

Open Text Box.

PAGE BREAK

COVID-19

Please identify how you were impacted by COVID-19, select all that apply. If you would like to share an additional option, please type your response in “other”.

Diminished personal health

Diminished family health

Increase in mental stress

Increase in physical stress
 Increase in financial pressures
 Unable to pay rent/ mortgage/ etc.
 Business closure
 Loss of job or unemployment
 Inability to see family/ friends/ social networks
 Other:

How effective, on a scale of 1-10 do you believe [community] has been in addressing COVID-19, with 1 being not effective at all, and 10 being fully effective?
 Scale 1- 10

Based on your needs for response to COVID-19, please identify how helpful each organization was in providing resources, support or technical assistance during COVID-19. If you would like to add an additional, please fill in "other". (checkboxes ranging from most helpful to least helpful to NA)

County government
 City government
 [state] department of agriculture
 [state] department of education
 [state] department of public health
 [University]
 [College]
 Non-profit organizations
 Other:

Please describe any strategies you believe would help your [community] respond to COVID-19.
 Open Text Box.

Demographics

Please fill in the following information regarding your demographics

What is your current age?

18 – 24
 25 – 34
 35 – 44
 45 – 54
 54 – 64
 Over 65

What gender do you identify as?

Male
 Female
 Trans-gender
 Non-binary
 Prefer not to answer
 Other _____

What is your ethnicity?

Not Hispanic or Latino
Hispanic or Latino

What is your race? (If you identify with multiple races, please select all that apply)

American Indian or Alaska Native
Black or African American
Asian
Native Hawaiian or other Pacific Islander
White
Unknown
Prefer not to say
Other

Which of the following best describes your current employment status?

Full-time employment
Part-time employment
Unemployed (looking for work)
Unemployed (not looking for work)
Student
Unable to work

Display logic- if answered full time employed or part-time employed.

What is your annual income?

Below \$9,999
\$10 000 to \$24 999
\$25 000 to 49 999
\$50 000 to 74 999
\$75 000 to 99 999
\$100 000 to 149 999
Over \$150 000
Prefer not to answer

What is your highest level of education completed?

High school
Some high school
Bachelor's degree
Master's degree
Ph.D. or higher
Associates degree
Trade school
Prefer not to say
Other _____

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Thank you for participating in this survey. If you have any additional comments, please feel free to share below.

There will be three different focus groups hosted in Spring 2021 regarding community food systems resilience. If you are interested in participating, please reach out to Courtney Long-court7@iastate.edu for more information.

Appendix C. Approval for Research (IRB)

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Ethics
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 12/23/2020
To: Courtney Long
From: Office of Research Ethics
Title: Extension's Role in Supporting Resilient Community Food Systems in the United States
IRB ID: 20-471
Submission Type: Initial Submission **Exemption Date:** 12/23/2020

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

A modification was made in 10/04/2022 with approval shown below.

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Ethics
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 10/04/2022
To: Courtney Long
From: Office of Research Ethics
Title: Extension's Role in Supporting Resilient Community Food Systems in the United States
IRB ID: 20-471
Submission Type: Modification **Exemption Date:** 10/04/2022

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

Appendix D: Indicators by Age

Percentage of individuals by age who selected each value as one of their top 3 values					
	25-34 (N=20)	35-44 (N=33)	45-54 (N=36)	55-64 (N=70)	over 65 (N=93)
Education	40.00%	51.52%	36.11%	38.57%	44.09%
Diversity	25.00%	36.36%	19.44%	28.57%	24.73%
Environment	50.00%	36.36%	41.67%	41.43%	47.31%
Trust	20.00%	21.21%	22.22%	21.43%	29.03%
Accountability	15.00%	15.15%	22.22%	25.71%	20.43%
Security	5.00%	27.27%	22.22%	18.57%	20.43%
Future Generations	5.00%	27.27%	19.44%	24.29%	25.81%
Generosity	20.00%	6.06%	25.00%	15.71%	21.51%
Community Ownership	40.00%	24.24%	27.78%	14.29%	22.58%
Partnership	35.00%	9.09%	22.22%	5.71%	5.38%
Culture	15.00%	24.24%	16.67%	11.43%	10.75%
Heritage	0.00%	6.06%	5.56%	12.86%	4.30%
Individualism	0.00%	3.03%	5.56%	11.43%	6.45%
Benevolence	10.00%	9.09%	11.11%	7.14%	9.68%
Financial growth	15.00%	3.03%	8.33%	5.71%	1.08%
Wealth	0.00%	0.00%	0.00%	5.71%	1.08%
Conformity	0.00%	0.00%	2.78%	0.00%	0.00%
Percentage of individuals by age who stated they participated in each activity					
	25-34 (N=20)	35-44 (N=33)	45-54 (N=36)	55-64 (N=70)	over 65 (N=93)
Vote in local elections	100.00%	84.85%	88.89%	92.86%	94.62%
Purchase from local businesses	95.00%	87.88%	94.44%	98.57%	90.32%
Build relationships with neighbors and people in my community	95.00%	81.82%	83.33%	75.71%	88.17%
Utilize public community assets (parks, libraries, etc.)	90.00%	81.82%	75.00%	78.57%	80.65%
Volunteering	60.00%	75.76%	77.78%	72.86%	84.95%
Participate in seasonal celebrations	55.00%	66.67%	72.22%	77.14%	58.06%
Understand our heritage and history	25.00%	51.52%	50.00%	51.43%	56.99%
Own, manage or work for a local business/organization	65.00%	54.55%	61.11%	41.43%	33.33%
Percentage of individuals by age by level of perceived importance for local food and farm businesses					
	25-34 (N=20)	35-44 (N=33)	45-54 (N=36)	55-64 (N=70)	over 65 (N=93)
Extremely important	45.00%	48.48%	44.44%	55.71%	53.76%
Very important	35.00%	36.36%	47.22%	35.71%	34.41%
Moderately important	20.00%	15.15%	5.56%	4.29%	9.68%
Slightly important	0.00%	0.00%	2.78%	4.29%	2.15%
Not at all important	0.00%	0.00%	0.00%	0.00%	0.00%
Average level of importance for each attribute by age group (1 being not at all important, and 5 being extremely important)					
	25-34 (N=20)	35-44 (N=33)	45-54 (N=36)	55-64 (N=70)	over 65 (N=93)
Grown Local	3.9	3.79	3.78	4.01	3.72
Affordability	4	4.09	3.69	3.89	3.47
Relationship with producer, seller, etc.	3	3.18	3.11	3.06	2.76
Location	3.4	3.61	3.28	3.64	3.55
Convenience	3.6	3.82	3.72	3.71	3.5
Organic	2.75	2.82	2.64	3.09	2.71
Fresh	4	4.12	4.19	4.46	4.29
Food Safety Practices	3.6	3.73	3.78	3.87	3.79

Appendix E: Indicators by Education Level

Percentage of individuals by age who selected each value as one of their top 3 values					
	High School only N=20	Associates N=20	Bachelors N=90	Masters N=77	PhD or higher N=19
Education	40.00%	80.00%	36.67%	50.65%	47.37%
Diversity	10.00%	45.00%	23.33%	35.06%	42.11%
Environment	30.00%	75.00%	41.11%	55.84%	42.11%
Trust	15.00%	60.00%	27.78%	24.68%	15.79%
Accountability	45.00%	55.00%	22.22%	11.69%	15.79%
Security	25.00%	45.00%	26.67%	14.29%	5.26%
Future Generations	20.00%	55.00%	23.33%	19.48%	5.26%
Generosity	25.00%	35.00%	15.56%	11.69%	36.84%
Community Ownership	35.00%	25.00%	23.33%	23.38%	15.79%
Partnership	0.00%	25.00%	7.78%	19.48%	5.26%
Culture	0.00%	20.00%	20.00%	11.69%	15.79%
Heritage	10.00%	5.00%	8.89%	5.19%	0.00%
Individualism	10.00%	20.00%	6.67%	5.19%	0.00%
Benevolence	10.00%	25.00%	6.67%	10.39%	10.53%
Financial growth	0.00%	5.00%	7.78%	3.90%	5.26%
Wealth	5.00%	5.00%	1.11%	1.30%	5.26%
Conformity	5.00%	0.00%	0.00%	0.00%	0.00%
	High School only N=20	Associates N=20	Bachelors N=90	Masters N=77	PhD or higher N=19
Vote in local elections	95.00%	90.00%	93.33%	89.61%	89.47%
Purchase from local businesses	95.00%	90.00%	92.22%	94.81%	89.47%
Build relationships with neighbors and people in my community	65.00%	80.00%	84.44%	84.42%	78.95%
Utilize public community assets (parks, libraries, etc.)	65.00%	70.00%	85.56%	83.12%	89.47%
Volunteering	55.00%	80.00%	75.56%	81.82%	94.74%
Participate in seasonal celebrations	65.00%	80.00%	67.78%	64.94%	47.37%
Understand our heritage and history	35.00%	50.00%	53.33%	46.75%	73.68%
Own, manage or work for a local business/organization	30.00%	40.00%	41.11%	49.35%	36.84%
Percentage of individuals by age by level of perceived importance for local food and farm businesses					
	High School only N=20	Associates N=20	Bachelors N=90	Masters N=77	PhD or higher N=19
Extremely important	60.00%	35.00%	43.33%	53.25%	63.16%
Very important	30.00%	60.00%	41.11%	33.77%	21.05%
Moderately important	5.00%	5.00%	12.22%	10.39%	10.53%
Slightly important	5.00%	0.00%	3.33%	2.60%	0.00%
Not at all important	0.00%	0.00%	0.00%	0.00%	0.00%
Average level of importance for each attribute by age group (1 being not at all important, and 5 being extremely important)					
	High School only N=20	Associates N=20	Bachelors N=90	Masters N=77	PhD or higher N=19
Grown Local	3.9	3.75	3.73	3.84	4
Affordability	4.15	3.8	3.67	3.62	3.68
Relationship with producer, seller, etc.	2.95	3.1	3.01	2.94	2.42
Location	3.9	3.75	3.6	3.34	3.37
Convenience	3.8	3.5	3.71	3.61	3.21
Organic	2.3	2.85	2.83	2.96	2.84
Fresh	4.4	4.1	4.33	4.22	4.42
Food Safety Practices	3.65	4.15	3.84	3.53	3.84

Appendix F: Indicators by Gender

Percentage of individuals by education level who selected each value as one of their top 3 values		
	Female (N=193)	Male (N=52)
Education	44.56%	34.62%
Diversity	29.53%	19.23%
Environment	49.22%	23.08%
Trust	25.39%	21.15%
Accountability	20.21%	26.92%
Security	19.69%	23.08%
Future Generations	21.76%	26.92%
Generosity	20.21%	11.54%
Community Ownership	17.10%	42.31%
Partnership	9.84%	15.38%
Culture	12.95%	13.46%
Heritage	6.74%	7.69%
Individualism	6.22%	5.77%
Benevolence	11.92%	1.92%
Financial growth	4.15%	3.85%
Wealth	0.52%	5.77%
Conformity	0.00%	1.92%
Percentage of individuals by education level who stated they participated in each activity		
	Female (N=193)	Male (N=52)
Vote in local elections	91.71%	84.62%
Purchase from local businesses	94.30%	88.46%
Build relationships with neighbors and people in my community	83.94%	80.77%
Utilize public community assets (parks, libraries, etc.)	83.94%	65.38%
Volunteering	77.72%	76.92%
Participate in seasonal celebrations	64.77%	71.15%
Understand our heritage and history	51.30%	46.15%
Own, manage or work for a local business/organization	41.97%	51.92%
Percentage of individuals by education level by perceived importance for local food and farm businesses		
	Female (N=193)	Male (N=52)
Extremely important	51.81%	48.08%
Very important	38.34%	32.69%
Moderately important	8.29%	13.46%
Slightly important	1.55%	5.77%
Not at all important	0.00%	0.00%
Average level of importance for each attribute by education level (1 being not at all important, and 5 being extremely important)		
	Female (N=193)	Male (N=52)
Grown Local	3.9	3.5
Affordability	3.75	3.67
Relationship with producer, seller, etc.	2.99	2.83
Location	3.55	3.5
Convenience	3.67	3.58
Organic	2.92	2.42
Fresh	4.3	4.21
Food Safety Practices	3.81	3.87

CHAPTER 4. CONNECTION TO LIBERATION EXTENSION: THE ROLE OF LAND-GRANT UNIVERSITY EXTENSION IN SUPPORTING RESILIENT COMMUNITY FOOD SYSTEMS

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Abstract

COVID-19 and the increase of natural disasters over the last decade have intensified the need for collective involvement for community resilience. To create resilience, diverse and collective collaboration across areas of planning, preparing, and responding is necessary. While there has been research regarding general practices of disaster response for communities, this research looks at the usefulness in both human made and natural disaster preparedness, response, and recovery, and a specific review of Land-Grant University (LGU) and Extension (LGU-E) through the lens of resilient community food systems (RCFS). Due to their tripartite goals of research, outreach, and education, Land-Grant University Extension (LGU-E), this research hypothesized that LGU-E would be well positioned to support in facilitation, strategic planning, and technical assistance for RCFS. This chapter discusses different types of organizations that may be useful in developing RCFS, based on a mixed-methods research study with five case-study communities across the nation. The chapter reviews organizations support and usefulness in response and recovery and the potential roles for creating RCFS in the future. The chapter also addresses the strength of relationships LGU-E has with community actors of RCFS and brings to light the need for rebuilding relationships and trust across community. The primary argument of

⁵ This chapter is currently a work in progress. It may differ in significant ways from the published version.

the chapter is that organizations, and LGU-E specifically, can improve capacity for RCFS through technical assistance and strategic planning. However, this is only if trust can be developed between community actors and LGU-E.

Introduction

This research focuses on the intersection of resilience, community food systems, and organization support, including the specific role that Land-Grant University Extension (LGU-E) holds within the space of resilient community food systems. This chapter discusses organizational support and usefulness for response to human-made and natural disasters. Specifically, we will review Land-Grant University Extension (LGU-E) existing and potential methods for supporting resilient community food systems. This will include an initial literature review of the history of Land-Grant Universities (LGU) and LGU-E, a synopsis of resilient community food systems, and reveal findings from a five-community case study to understand the extent of usefulness and potential of organizational support for resilient community food systems.

Land Grant Universities

All U.S states and territories have at least one Land-Grant University (LGU) that is tasked with a tripartite approach: research, education, and outreach (McDowell, 2003). The development and progress of LGUs and their Extension programs have over a 150-year history with the first LGU starting with the Morrill Act of 1862. Eighteen of the state colleges that received Land-Grant status from this legislation were in place prior to 1862, Iowa State University (opened in 1858) was the first to receive Land-Grant status and Yale University is the oldest University with a Land-Grant status, opening in 1701 (Mercier & Halbrook, 2020).

Land-Grant Universities receive funding from USDA through three different Morrill Acts: 1862, 1890, and 1994 (Association of Public and Land Grant Universities, 2019). The

Morrill Act of 1862 provided 30,000 acres of public land per senator and congressman in each state, leading to 17,430,000 acres of land (McDowell, 2003). The public land identified from the Morrill Act and distributed to LGUs was taken from indigenous populations and then sold (Copeland, 2022); with the sale of the land, LGUs were then able to profit and start an educational system (Ostrom, 2020). For example, South Dakota reported that the same lands donated through the Morrill Act had been “previously guaranteed by the U.S. government to the Lakota and Dakota tribes, primarily through the Fort Laramie Treaty of 1868...however, under the Dawes Act, the federal government claimed much of the land in western South Dakota to use it for a variety of purposes including the land that was then given to land-grant colleges” (Dunn, 2017). As a result, through acknowledgement of their history, SDSU has established a “Wokini Initiative,” meaning new life, that proposes the use of annual revenue from the land received from the Morrill act to be set aside for achieving interests in partnership with the nine tribal nations in South Dakota (Dunn, 2017). In addition to LGUs receiving land from the Morrill Act, within the same year, the Homestead Act was also passed, which provided citizens with the ability to receive 160 acres of public land, to support the desire to increase farming across the country (Backgrounder on the Morrill Act, 1862). The Homestead Act had additional ramifications on the use, tenure, and acquisition of land from indigenous tribes.

Prior to the Morrill Act, education was primarily conducted through private Universities and was seen as something for individuals with financial status. The Morrill Act allowed LGUs to create accessible education to a broader population (McDowell, 2003). Specifically, the Act created LGUs to provide education in areas of agriculture, community development, human science, and youth development (Clancy, 2017). In 1887, the Hatch Act sanctioned each state to develop agricultural experiment stations, allowing for firsthand research and experimentation to

occur on farmland owned by the state (McDowell, 2003; Ostrom, 2020). Almost thirty years following the Morrill Act of 1862, the Morrill Act of 1890, a provision was made that LGUs were unable to discriminate based on race within admissions policies for colleges (Copeland, 2022; Mercier & Halbrook, 2020). If LGUs discriminated, they would not receive federal funding. However, the act also allowed for the primary LGU in the state to remain segregated, if they created a second University as an HBU or 1890, of which 19 were created (Mercier & Halbrook, 2020).

Land-Grant University Extension

About 20 years later, in 1914, Extension became associated with LGUs through the Smith-Lever Act (Association of Public and Land Grant Universities, 2019). The Land-Grant University Extension (LGU-E) objectives included teaching agriculture and providing outreach and education to community members about access to safe and affordable foods (Schneider, 2014). Predominantly, this included agents that had expertise in agriculture, life, and social sciences, and programming with community (Copeland, 2022). The Smith Lever Act specifically connected Land Grant Universities with USDA, leading to dissemination of research across each state and the Nation related to the findings at experiment stations for vocational training and education (Mercier & Halbrook, 2020). The Smith-Lever Act discussions began discussions in 1907 and revolved around desires to create vocational training for individuals who were unable to attend college (Mercier & Halbrook, 2020). Similar to previous legislation, the Smith-Lever Act also had concerns around discrimination. According to Seal's, the Smith Lever Act was the first bill that had open debate on specific discrimination issues (Seals, 1991). The Smith Lever Act also provided support to creating county offices and funding county agents that could help with programming like 4H, agriculture, and home economics (Mercier & Halbrook, 2020). While the Smith Lever Act created federal funding allocation, LGU-E also received funding

from their state legislature which can be allocated to variable programs based on the state desires (Mercier & Halbrook, 2020).

Not until 1994 did 30 Native American Tribal colleges become included in the LGU programming through Improving America's Schools Act of 1994 (Kowalkowski, Frieson, & Phillips, 2022). While they did not receive formal recognition until 1994, there were Tribal Colleges and Universities that were formed across Indian Country in the late 1960s and 1970s (Kowalkowski, Frieson, & Phillips, 2022). Hispanic-serving institutions didn't become eligible until 1998 under the Agricultural Extension, Research and Education Reform Act (Mercier & Halbrook, 2020).

Today, each LGU and LGU-E face varying challenges from capacity for programming, funding support and personnel. This includes the continuous need to seek funding through federal, state, and local resources (Ostrom, 2020), which include legislative funding allocations as well as grants for research, education, and outreach. As mentioned, each LGU receives federal funding support, however, 1890s and 1994s receive significantly less funding than 1862s (Kowalkowski, Frieson, & Phillips, 2022; Copeland, 2022). The discrepancy in funding may also be due to the lack of recognized capacity within 1890s and 1994s, and the requirement to provide a direct match for the federal funds received (Copeland, 2022).

Each LGU-E is typically composed of four programs. To describe, we will look at the example of Iowa State University Extension and Outreach (ISUEO) which as Agriculture and Natural Resources (ANR), Community Economic Development (CED), 4H, and Human Sciences (HS) (Iowa State University Extension and Outreach, 2023). There are faculty, state field specialists, county agents, and numerous volunteers that comprise the staff of Extension (McDowell, 2003). Typically, the programs are connected to a college or department on campus.

For example, at ISUEO faculty across the University connect to Extension, but primarily, each Director of an Extension program is connected to a primary college: ANR is connected to the College of Agriculture, CED is connected to College of Design, HS is connected to College of Human Sciences. 4H is the only department that doesn't have a direct connection to a college but has transdisciplinary programming that pulls from research in different colleges.

While LGUs and LGUEs have been instrumental in developing higher education and learning opportunities for agriculture, including the development of the agricultural knowledge and information system (McDowell, 2003), they continue to face criticism regarding relevance and ability to meet needs of the public (Kowalkowski, Frieson, & Phillips, 2022; Copeland, 2022; Byrne, 1998; Ostrom, 2020). Rapid community changes are forcing new considerations for how to best support and respond to community-based needs (Byrne, Outreach, Engagement, and the Changing Culture of the University, 2016). Changes in community are found in social conditions, economics, environment, policy, demographics, technology, and pandemics. According to Byrne, there has been “apparent failure of higher education to keep pace with societal change and to meet additional challenges of declining funding, increased accountability, and shifts in public attitudes...” (Byrne, Outreach, Engagement, and the Changing Culture of the University, 2016, p. 53).

Transdisciplinary Programming: Resilient Community Food Systems

One area of emergent need is around transdisciplinary work, which includes programming such as community food systems (Copeland, 2022). Commodity agriculture has been the predominant focus of LGUE since fruition, however, there is an opportunity for LGUEs to participate and support the growing need for community food systems and resilience (Kopp, 2021). Community food systems (CFS) have been a relatively new explored program for Extension (Galt, Clark, & Parr, 2012). CFS are place-based systems that promote equitable

engagement in all areas of the food system: production, processing, distribution, consumption, and resource management (Long, 2017). A CFS is typically derived from a community process that assists in utilizing community knowledge to inform decisions about food systems creation (Feenstra, 2002). The goals of which are to create a system, process, and infrastructure, in which food travels, while also contributing to essential community capitals, including areas of policy, equity, economy, wellness, environmental stewardship, built infrastructure, and education (Feenstra, 2002; Campbell, 2004; Long, 2017). Community food systems offer options to invite participation from community members (Dixon, 2011), which allows further engagement and connections to the community.

Community food systems are impacted by changes occurring across the country from ecological shifts, increased disasters prevalence, rural population decline, COVID-19 impacts, and general livability conditions for future generations (Fainstein, 2014; Lin & Chang, 2013; Nelson, Zak, Davine, & Pau, 2016). These impacts include sudden shocks (e.g., catastrophic weather events), intermittent shocks (e.g. price volatility), and gradual pressures (e.g. climate change and shifting human diets) that impact each community uniquely due to their place-based vulnerabilities (Schipanski, et al., 2016).

The tripartite aspect of LGU-E offers transdisciplinary potential to be involved in resilience, including preparedness, response, and recovery from a disaster (Kopp, 2021; Copeland, 2022). Common attributes of resilience include three areas, first, the ability to respond to shocks and stressors; second, a temporal focus on long-term effects from the initial shock or stressor; and third, the need for action at multiple levels or scales (individuals, households, communities, and systems) (Harris & Spiegel, 2019). Understanding the impact of changes and shifts that occur within community is a critical first step in developing a resilient community

food system (RCFS) (Vermeulen, Campbell, & Ingram, 2012; Schipanski, et al., 2016; Himanen et al., 2016). Due to the complexity of a RCFS, there is a need to determine partners in place and major players that affect the dynamics of the system (Brennan, Frumento, Bridger, & Alter, 2013; Harris & Spiegel, 2019; Himanen et al., 2016; Schipanski, et al., 2016). LGU-Es have been influential in providing research on farmer impact, supply chain infrastructure, and general community development as it relates to food and may be well suited to support in this effort if there are willing to adapt to new ways of doing. Copeland coined a term, liberation extension, which could be the option communities are looking for, an LGU-E that is embedded in community, working across demographics, networking, and building capacity that is relevant and place-based (Copeland, 2022).

To further discuss the necessary considerations for LGU-E and resilient community food systems, a literature review will be detailed. Following, methods, analysis, and findings from a mixed-methods research study in five place-based communities will be reviewed.

Literature Review

Land-Grant University Extension

For the last several decades, about every ten to fifteen years, a new wave of concerns come into play for Extension's relevance to the communities they serve. While LGUs were started to research and support agriculture production and expansion, by the late 1900s, industrialization and monopolization of the agricultural industry created concerns (Meyer, 1993; Hamm, 1997). Additionally, LGUs were seen to have closer allegiances to federal government and USDA and were criticized for being more politically oriented in their efforts than science-based (Meyer, 1993). In the 1990s, urbanization, industrial agriculture, and changing demographics were seen as challenges for Extension, specifically in efforts to shift teaching practices from traditional agriculture to more modern farming practices that relate to food

systems, technology, and environmental quality (Meyer, 1993). In 1996, the Kellogg Commission reviewed LGUEs and identified strategies to increase engagement. Kellogg published a report “Returning to Our Roots: The Engaged Institution” (McDowell, 2003; Byrne, 2016), stating that engagement was a primary need and suggested that LGUs repair and build trust with community, primarily through the platform of Extension (Byrne, 2016). However, engagement wasn’t yet seen as a scholarly activity, although it was viewed as providing knowledge for those participating in programming (Byrne, 1998). This led to constraints between faculty and Extension staff. Following the initial report, additional reflections and research reports have been published in 2003, 2016, and 2022 (McDowell, 2003; Byrne, 1998; Copeland, 2022; Kowalkowski, Frieson, & Phillips, 2022). Each have discussed the need for engagement, and in recent years have focused on collective facilitation and trust building within community.

2000s

Like Byrne, McDowell shared perspectives that LGU-E should reach out to the public and focus on transferring knowledge from research findings of the university to the public (McDowell, 2003). Engagement provides both the dissemination of information from the LGU and allows for LGU-E to learn from the public and co-create programming through partnership (Byrne, 2016; McDowell, 2003). McDowell also highlighted the need for shifting focus from traditional agriculture research and world-wide competition to local production and community (McDowell, 2003). While McDowell argues that LGUs successfully completed their initial mission of enabling farmers, and the agriculture sector, to compete globally and become one of the most successful sectors of the U.S. economy, they also argue that LGUEs need to shift and respond to the current and modern needs of community (McDowell, 2003). Thus, the desire for a more engaged system including introducing a mix of experiences, iterative discussions, and learning with community was suggested. Unfortunately, best practices for building relationships

and trust, or the ability for shared transfer of knowledge between community and LGU-Es were not identified (Wilkins, 2005).

2010s

In 2012, another discussion on Extension's relevance was brought up regarding disruptive innovation and response to community needs (Franz & Cox, 2012; Galt, Clark, & Parr, 2012). Franz and Cox argued that LGUEs had not been able to respond to needs because of organization culture and status quo, funding entitlement, lack of diversity, link to academics and bureaucracy, and the expert-model paradigm (Franz & Cox, 2012). It was argued that in order to better respond and disrupt the norm, that LGUs needed to find early adopters, innovate, and hire leaders and staff that support and are comfortable with innovation, can learn from others, and are willing to address systemic causes rather than addressing symptoms (Franz & Cox, 2012). It was suggested that addressing the role of values throughout the work of Extension could be beneficial, both as it relates to agriculture and food systems and the broader community environment (Galt, Clark, & Parr, 2012).

2017-2018 saw yet another review of LGU-Es, specifically in relation to climate (Association of Public and Land Grant Universities, 2019; Tobin, Radhakrishna, Chatrchyan, & Allred, 2017). The report *Challenge on Change* was developed after a convening of Inter-Institute Network of Food, Agriculture and Sustainability (INFAS). INFAS assessed the role of LGU and LGU-E on global food security and identified seven challenges from areas of availability, access, and utilization of food (Association of Public and Land-grant Universities, 2019). While climate change is addressed by LGU faculty, there was concern that Extension is not prepared to respond and educate the broader public (Tobin, Radhakrishna, Chatrchyan, & Allred, 2017). In addition to the perspectives on climate, INFAS also identified limitations around anti-racism and diversity, equity, and inclusion practices. In a response to the Challenge

of Change, members from INFAS developed a follow-up report that discussed the need for an anti-racist lens, including desire for collective change, including systemic food systems shifts in production, distribution and consumer behavior, and a need to acknowledge and empower diverse populations and communities (INFAS: Inter-Institutional Network for Food, Agriculture and Sustainability, 2018). Suggestions for change included, elevating community empowerment and agency amongst community members, developing community partnerships, aligning university resources with transdisciplinary approaches geared at systemic solutions, and educating new generations to be systems and transdisciplinary thinkers (INFAS: Inter-Institutional Network for Food, Agriculture and Sustainability, 2018; Tobin, Radhakrishna, Chatrchyan, & Allred, 2017).

2020s

These concepts were reiterated by Copeland, Kowalski et. al, Kopp, and Ostrom between 2020-2022. Each discuss the dynamic opportunities of LGU-Es and their tripartite connections and ability to work with community. They share the need to focus on community engagement, local knowledge, and wisdom, specifically in the current era of COVID-19 and heightened needs for diversity, equity, and inclusion with changing demographics. This includes concerns of racial hierarchies and injustices that have been in place since the beginning of LGU and LGU-E (Copeland, 2022; Kowalkowski, Frieson, & Phillips, 2022; Kopp, 2021). LGU-Es have an opportunity to respond to climate change and natural disasters (Kopp, 2021; Copeland, 2022), to help facilitate and create opportunities for broad representation and collective action, (Ostrom, 2020; Kowalkowski, Frieson, & Phillips, 2022), and foster relationships across 1862, 1890s, and 1994s; specifically with a call for 1862s to learn from different practices and repair wrongs (Kopp, 2021; Kowalkowski, Frieson, & Phillips, 2022; Copeland, 2022).

Resilient Community Food Systems

This research focuses on resilient community food systems, with a definition of the capacity for a place- and values-based food systems, and the actors within, to withstand shocks and disruptive pressures while maintaining basic structures, processes and functions of and within the community food system and supply chain, ensure the ability to produce and access nutritious and culturally acceptable food over time and space, and create a new normality (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020). The following section will briefly discuss the complexities and intersections of a resilient community food system and identify roles of LGU-E.

Food systems cross local, regional, and global scales and have different areas of participation and possibilities from policy creation, nutrition, and food security. They involve areas of interest like locally grown, sustainably raised, democratic participation, and community and economic development (Feenstra, 2002; Christensen & Phillips, 2016). Community food systems (CFS) are place-based systems and are determined in scale by its constituents. CFS allow for all members to equitably engage in the food system from production, processing, distribution, consumption, and resource management (Long, 2017), each of which are directly tied to LGU-E programming and research.

A CFS tends to be tied to the social fabric of the place. This is correlated with practices of community development. Community development frameworks are utilized to help revitalize and enhance community place-based assets and opportunities. Processes to assist in community development involve facilitation, visioning, and capacity development, which focus on resolving complicated systemic issues (Moomaw, 2016) that incorporate social, physical, and economic strategies (Sites, Chaskin, & Parks, 2007). There are several community development frameworks used to bring together actors within a system to assess, focus, and determine

appropriate next steps that supports cross-discipline and transformative discussions through multi-tiered understanding of the community (Partelow, 2018; Marshall, 2015). Examples of these frameworks include Collective Action Theory and Social-Ecological Systems Framework, which can support cross-discipline and transformative discussions through multi-tiered understanding of the community (Partelow, 2018; Marshall, 2015). Adaptive Decision-Making frameworks help assess adaptive capacity in response to disaster or disaster management (Prabhakar, Wright, & Tsurita, 2014) and National Sustainable Development Strategy includes economic and ecological understanding of the community in an effort for resiliency (Bass & Dalal-Clayton, 1995). The Community Capitals Framework provides a model for assessing and analyzing existing community conditions based on capitals, or assets, which include natural, cultural, human, social, political, financial and built capitals. The community capitals framework is beneficial for this work because food systems have a systemic nature that directly and indirectly impact community capitals as well as organizations, businesses, and individuals across (Ruhf, et al., 2017; Schipanski, et al., 2016).

Strategic community development and engagement includes developing goals that are place-based, with unique values, process and infrastructure, and community capitals that intersect with their food system (Dixon, 2011). This includes developing a systemic vision for the community and determining priority areas of development. Systems thinking is necessary with community food systems and community development processes for considering different sectors, scales, and food system actors (Ruhf et al., 2017; Himanen et al., 2016). An added layer to this is considering resilience for the community food system, through community development practices.

The community capitals framework provides a model for communities to assess their community food system resilience, including what shocks may impact a community and create change. Shocks are viewed as the sudden and immediate disasters such as a hurricane, tornado, or flood that impact food production, food access, and infrastructure of the food supply chain; stressors are then the long-term impacts and trends that are gradual such as drought or desertification (Harris & Spiegel, 2019). There is an opportunity to utilize community development processes in support of developing resilient community food systems that can identify vulnerabilities within the system, withstand disasters and promote resilient livelihoods in eras of change (Lin & Chang, 2013; Schipanski, et al., 2016; Ruhf et al., 2017).

Communities must understand how shocks and stressors impact their community to further assess and measure resilience and develop strategies to aptly respond, recover, and rebuild as a community (McCarthy & Wolnik, 2019). Vulnerability is a critical piece to understand and evaluate to determine resilience strategies (Lin & Chang, 2013). Conducting assessments of vulnerabilities, including power relations, social connections, cultural relevance, and environmental conditions, are vital to understand and develop a resilient method for the future (Lin & Chang, 2013). In addition to identifying vulnerabilities, communities should identify disruptions that may occur and the impact they could have on existing conditions. Through assessment and understanding, communities will be able to plan their response after a shock and be able to adapt and change with little long-term loss for potential growth (Fainstein, 2014; Campanella, 2006). To showcase the intersection of community food systems, and aspects of resilience, Table 4-1 was created.

Table 4-1: Comparison of vulnerabilities, resilience, adaptive capacity, and transformation

Concept	Definition	Community Actors	Community Capitals	Food Systems
Vulnerability- varying characteristics impacting the potential for disaster	Vulnerability is the potential for harm to the community capitals (Committee on Increasing National Resilience to Hazards and Disasters and Committee on Science, Engineering, and Public Policy, 2012)	Disaster fatigue and stress have increased for individuals, households and communities, leading to a delayed response and ability to recover (Lowe, et al., 2019; Olshansky, Hopkins, & Johnson, 2012)	Catastrophic weather events, intermittent shocks (e.g., price volatility), and gradual pressures (e.g., climate change and shifting human diets) (Schipanski, et al., 2016)	Decreased production yields, inability to distribute food products, business closures, and lack of ability to access food (Freitag, Abramson, Chalana, & Dixon, 2015; Schipanski, et al., Realizing Resilient Food Systems, 2016; Walker, et al., 2006).
Resilience- level of ability to respond and withstand an impact	Resilience is operationalized through the ecological framework, which cuts across scales, interactions, ecology, and social domains (Brand and Jax 2007; Walker, et al., 2006). Resilience is “the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity” (Walker et al. 2006).	Extent of individuals, or groups, ability to withstand a disaster or event; including trust, diversity, relationships and networks (Walker et. al 2006).	An aspect of resilience and ability to respond, is the scope of impact from a disaster (Committee on Increasing National Resilience to Hazards and Disasters and Committee on Science, Engineering, and Public Policy, 2012); need for response diversity across capitals and ecosystems (Walker et. al., 2006)	Ability to withstand shocks and disruptive pressures while maintaining basic structures, processes and functions of and within the community food system and supply chain, ensuring the ability to produce and access nutritious and culturally acceptable food over time and space, and creating a new normality (Fainstein, 2014; Campanella, 2006; Schipanski et. Al., 2020).
Adaptive Capacity – ability to respond and manage	Adaptability refers to the way a community or group can manage resilience and the “self-organization without system-level intent or centralized control” (Walker, et al., 2006)	Ability to self-organize and increasing equitable engagement in planning practices and response (Schipanski, et. al. 2020); adaptability of a group is largely based on the function of an individual (Walker et. al. 2006)	Leadership capacity and networks can help with adaptive capacity and assist in response for a community (Brand & Jax, 2007; Engle, 2011).	Adaptability is the ability of a system prepare for stresses in advance of an impact, or to be able to adjust to the effected of the stress (Engle, 2011)
Transformation – need to change current conditions to be resilient in the future	Transformation occurs when a fundamentally new system is needed due to a shock (Walker, et al., 2006). Transformation can also be needed when social constraints, such as policies or government do not assist in adaptation, and a new paradigm is necessary (Walker, et al., 2006).	Elevate Food and Nutrition Security to a Top Priority; 2 Align University Resources and Structures for Transdisciplinary Approaches; 3 Enhance and Build University-Community Partnerships; Educate a New Generation of Students to be Transdisciplinary Problem Solvers (Association of Public and Land Grant Universities)	Need to change regime or political structure; found in recognition of past failure due to policy/ resource management/ or social value crisis (Walker et. al. 2006)	Increasing productivity; scaling-up of agriculture (from small-scale production systems); technology advancement (Aday and Aday 2020); address equality issues, support agroecological production practices, develop regional food systems, and access to cultural and health foods (Schipanski et. al. 2020)

While there is research on farmer impact, supply chain infrastructure, and general community development as it relates to food, there is little research that showcases ways to improve resilience for a community food system. Due to the complexity of a RCFS, there is a need to determine partners in place and major players that affect the dynamics of the system (Brennan, Frumento, Bridger, & Alter, 2013; Harris & Spiegel, 2019; Himanen et al., 2016; Schipanski, et al., 2016). Organizations can facilitate and bring together community actors engaged across and within RCFS. While many organizations may be well suited to facilitate, LGU-E could also be a potential support in research, facilitation, and community development processes to fully assess, understand, and develop resilient community food systems CFS (Winter-Nelson, 2016; INFAS: Inter-Institutional Network for Food, Agriculture and Sustainability, 2018; Clancy, 2017; Galt et al., 2012; Sitaker et al., 2014).

While challenges and changes of LGU-E are ongoing, LGU-Es are equipped to support the response and increase of community food systems resilience, because they have shown a staying power and active engagement within communities, agriculture, youth, and human development since inception. Similarly, LGU-Es are uniquely positioned to respond to the need for RCFS due to their transdisciplinary nature that includes community development processes, if they can restore relationships and build trust with community members (Galt, Clark, & Parr, 2012). Stepping in to support means making anew and breaking previous cycles of distrust in community (Copeland, 2022).

Methods and Data Collection

To assess the perception of organization's and LGU and LGU-E's current and potential future roles in resilient community food systems, a mixed methods research design (Hesse-Biber, 2010) was used with appreciative inquiry interviews, participatory-based foresight focus group,

and surveys (Patton et al., 2015; Hebinck et al., 2018; Himanen et al., 2016; Ruhf et al., 2017).

This chapter received IRB Approval, IRB 20-471, in 12/23/2020 (see Appendix A).

Research was conducted in five place-based communities across the U.S between 2020-2022. Each experienced different types of natural disasters and climactic events as well as the manmade disaster, COVID-19. Table 4-2 details each place-based, partner organizations, disaster type, and research participation. Community actor types who participated in interviews and focus groups are shown in Table 4-3.

Table 4-2: Community Participation in RCFS research

COMMUNITY	PLACE-BASED COMMUNITY	PARTNER ORGANIZATION	DISASTER IN ADDITION TO COVID-19-19	RESEARCH PARTICIPATION
ALASKA	Rural: Kenai Peninsula	University of Alaska Extension and Outreach, Alaska Food Policy Council and Homer Soil and Water	Swan Lake Fire- 2019; additional climate events (flood, drought, ice, etc.)	7 interviews 2 focus groups - 6 participants 35 survey responses, completion rate 1.5%
ARKANSAS	Suburban: Washington and Benton County	University of Arkansas Extension and Outreach	Strong winds and tornado- 2017; additional climate events (flood, drought, ice, etc.)	13 interviews 1 focus group – 6 participants 109 survey responses, completion rate 16%
IOWA	Rural: Marshall County	Iowa State University Extension, Marshall County Extension	Derecho- 2020 and Tornado -2018	19 interviews 2 focus groups – 6 participants 35 survey responses, completion rate 5%
TEXAS	Rural: Bastrop County	Texas Center for Local Food	Lost Pines Fire – 2011; additional climate events (flood, drought, winter storm, etc.)	17 interviews 5 focus groups- 12 participants 76 survey responses, completion rate 18%
US VIRGIN ISLANDS	Regional: Territory	Virgin Islands Good Food Coalition	Hurricane Irma and Maria – 2017	12 interviews 3 focus groups – 17 participants 18 survey respondents, completion rate 3.8%
TOTAL				68 interviews 13 focus groups: 47 participants 273 survey participants

Table 4-3: Community Actor Interview Types reviewed by community food system sectors and community capitals

Community Food Systems	
Cultivation and Harvesting	Gardeners and homesteaders, farmers, fishers, hunters
Processing and Transformation	At home food processors, shared-use kitchen managers, value-added business creators, and processing facility managers
Distribution and Marketing	Community Supported Agriculture business owners; food box and food hub managers, farmers market managers, grocery store managers, school dining and nutrition directors, and food bank managers
Food Access and Consumption	Food pantry and meal program coordinators, college and hospital dining directors, state departments of public health and nutrition, restaurants and food truck owners, Food System Policy Councils and Coalitions
Resource Stewardship	Natural Resource and Conservation district personnel, Department of Natural Resource personnel, Land Trust coordinators; Fishery and Coastal Management coordinators, non-profit organizations working to reduce waste, and gleaning program coordinators
Community Capitals	
Natural Capital	Individuals listed in cultivation and harvesting and resource stewardship, Land-Grant University Campus Faculty & Staff working in areas of agriculture, FEMA staff,
Cultural Capital	Indigenous organization coordinators, Latinx community members, residents, community foundation staff, Land-Grant University Campus Faculty & Staff working in community
Human Capital	Residents, school and college administrators, employers
Social Capital	Residents, city council and elected officials, individuals involved in networks, coalitions and boards, Land-Grant University Campus Faculty & Staff working in community
Political Capital	Elected officials; city, county and state departments; University staff members; board members for non-profits
Financial Capital	Bank staff, economic development authority personnel, lending organization staff, business owners
Built Capital	All individuals within community food systems; City, county and state departments;

Data collection occurred over a series of steps. First, appreciative inquiry interviews were conducted with different actors to understand current conditions of RCFS. Second, transcripts were reviewed and coded. Third focus groups were conducted in person in each community, utilizing participatory foresight process to encourage collective thinking on “what-if” scenarios for response in the future to manmade and natural disasters. Fourth, focus group transcripts were coded within the same framework as interviews, allowing for additional codes and themes to arise. Last, an individual survey was developed based on codes. Surveys were disseminated to community members through partner listservs.

Interview questions started with broad community perspective questions of assets and limitations, and then homed in on more specific questions for developing ideas for progress moving forward (Gaffey, 2013). Each interview lasted between 30-60 minutes. Following

interviews, each community held in person focus groups that responded to two participatory foresight questions, one based on local-disaster related to future planning, and the second related to the most recent national pandemic of COVID-19. The focus groups also included questions on organizations that should support the planning, response, and recovery efforts. Foresight has been shown to support the visioning of the desired future and the co-development of strategies and planning for systems transformation (Hebinck, Vervoort, Hebinck, Rutting, & Galli, 2018). This collective action process allowed participants to collectively share what occurred during each disaster and their opinions on what would need to occur differently if a similar situation occurred (Himanen, Rikkonen, & Kahiluoto, *CFodesigning a resilient food system*, 2016). The data collected was then used to determine appropriate questions for an individual survey that was shared through listservs from community partners to understand usefulness of organizations in response to COVID-19 and natural disasters. To conclude the participatory process, overall interpretation was prepared in a report of findings as a snapshot for each community. In addition to the research methods described, secondary data based on indicators for resilience, community food systems, and community development were identified to share context with communities.

NVivo software was used to code each interview and focus group transcript, with specific categories related to community capitals, community food systems and organizational support. From the codes, the research team created a survey for individuals in each case study to further investigate how individuals perceived resilient community food systems and organizational usefulness in response to COVID-19 and natural disasters. While this research seeks to understand LGU-E's role in resilient community food systems, interviews and focus groups also highlighted additional support organizations. This led to a compiled list of at least 10 organizations, six of which were common across each community: City and County/ Borough

government; State Departments of Agriculture, Education, and Public Health; Land Grant University, Extension, and Local Extension offices. Additional types of organizations included non-profits, businesses, and FEMA (Table 4-4).

Table 4-4: Organizations Responding to Natural Disaster and COVID-19

<i>Community</i>	Pre-assigned community organizations	Additional organizations provided in “other” for Natural Disaster	Additional organizations provided in “other” for COVID
<i>Kenai Peninsula, Alaska</i>	Borough and City Government; Agriculture, Education, Public Health, and Alaska Fish and Game State Departments; University of Alaska; University of Alaska Extension; Kenai Peninsula District Extension; Kenai Soil and Water; and CookInlet Keeper	Alaska Division of Forestry, Alaska Department of Transportation, schools, radio news channels, Local Food Connection, and Alaska Food Coalition	Alaska state COVID Data, schools, radio news channels, South Peninsula Hospital, Save U More, USDA, and NRCS **useless: Kenai Peninsula school district, Alaska State COVID data
<i>Benton and Washington County, Arkansas</i>	Country and City Government; Agriculture, Education, and Public Health State Departments; University of Arkansas, University of Arkansas Extension; Benton and Washington County Extension; University of Arkansas Medical School; Walton Family Foundation; Tyson; Fayetteville Famers Market; and Food Conservancy	State Farm, School Districts, Neighbors	Mercy Hospital, CDC, News Sources, NWA Food Bank, State Government
<i>Marshall County, Iowa</i>	County and City Government; Agriculture, Education, and Public Health State Departments; Iowa State University; Iowa State University Extension; Marshall County Extension; JBS meat processing; and FEMA	Insurance companies, local community, Team Rubicon, Habitat for Humanity, Local Social Services, Red Cross, and local restaurants	Small Business Association and local Social Services
<i>Bastrop County, Texas</i>	County and City Government; Agriculture, Education, and Public Health State Departments; Texas A&M University; Texas A&M Extension; Bastrop County Extension; Texas Center for Local Food; Bastrop County Cares; and FEMA	Churches, local school districts, local businesses, neighbors, USDA, Common Market, Texas recovery, and self	Churches, neighbors, school districts, self, Walmart, UT Austin, and USDA **extremely useless: state Government/ governor
<i>Territory of the Virgin Islands</i>	Borough and City Government; Agriculture, Education, and Public Health State Departments; University of Virgin Islands; University of Virgin Islands Extension; We Grow Food; Virgin Islands Good Food Coalition; Research and Technology Park; and FEMA	Church, All Hands, and non-profits	

Within the survey, individuals were asked to select if they experienced a natural disaster or COVID-19, if they selected “yes”, they were then shown additional questions through display logic that asked about their impact from the natural disaster or COVID-19, the extent of recovery, and organizational usefulness for responding to the disaster. Individuals were asked to rank each organization based on their usefulness in providing resources, support, or technical assistance on a scale of extremely useless to extremely useful. After survey responses were collected, extremely useless was coded as a 1 and extremely useful was coded as a 5.

Analysis

This multi-faceted approach, across all five case studies, allowed for triangulation of data and analysis both within and across the cases. Interviews allowed for improved understanding of existing organizational support and capacity for natural disasters and COVID response. Focus groups provided collective thought and discussion on future goals and opportunities for organizational response and engagement. Surveys provided quantitative insights to understanding individuals’ perceptions of organizational support in response to natural disasters and COVID-19.

Qualitative data was aggregated into NVivo for analysis. Initial themes and potential indicators were developed based on organizational usefulness. Quantitative data was analyzed in Excel to compare responses from individuals across and within communities. While quantitative data did not yield statistically significant, or generalizable data, there are insights that can be gleaned from the research. Surveys were shared out through listservs from partner organizations and did not garner significant responses. This could be due to fatigue of surveys and research during COVID-19 or may generally show a lack of interest in the subject. In either case, respondents were from listservs of organizations that are involved in food systems work, and findings may be skewed based on the population that received the survey.

When analyzing data, Table 4-5 was created as perceived existing conditions for CFS indicators of production, processing, and distribution as well as LGU-E indicators of funding, staff capacity, and interest in RCFS. CFS indicators show general information about each sector and LGU-E indicators provide a score of low, moderate, or high to indicate the level of capacity in area. For example, a low funding score indicates minimal funding allocated to work in RCFS, compared to specific programs and systemic funding support across the LGU-E; a low staff ranking indicates that there is a relatively low amount of individuals staffed for this type of work, compared to dedicated staff and programming efforts; and low interest indicates the level of perceived interest and self-motivation to engage in RCFS, compared to a high score that would indicate LGU-E is engaging in RCFS outside of their own programming and area of work.

Table 4-5: Community Indicators: CFS and LGU-E

Community	Community Food System	LGU-E Capacity	Community
	Production	Processing and Distribution	
Alaska – Kenai Peninsula primary partner: Non-profit	Local production: self-sufficient agriculture including wild harvesting, rapidly increasing specialty-crops production National/ global: wild-caught seafood	Local: limited infrastructure and access to processing facilities/ storage/ etc. National/ global: fish processing and distribution	1862 Extension Land Grant: University of Alaska Funding: low Staff: low Interest: moderate
Arkansas-Benton and Washington counties primary partner: campus extension	Local production: specialty crops and diversified agriculture, small to mid-scale National/ global: grains, livestock	Local: limited processing options including meat and poultry processing and shared use kitchens; one food hub National/ global: meat processing, access to large markets such as Tyson, Walmart, and Cargill; well serviced roads and connections through county	1862 University of Arkansas Fayetteville Funding: moderate Staff: moderate Interest: moderate 1890 University of Arkansas Pine Bluff Funding: unknown Staff: unknown Interest: unknown
Iowa-Marshall county primary partner: County Extension	Local production: specialty crops and diversified agriculture, niche meat and dairy, small scale National/ global: grains, livestock, and seed	Local: strong food hub distribution, lack of storage and processing facilities for specialty crops and livestock National/ global: meat processing and distribution through JBS; well serviced roads and connections through county	1862 Extension Land Grant: Iowa State University Funding: moderate Staff: high Interest: high

Table 4-5 Continued

Community	Community Food System	LGU-E Capacity	Community
Texas – Bastrop County primary partner: Non-profit	Local production: specialty crops, diversified agriculture, niche meat National/ global: grains, livestock, and poultry	Local: limited distribution connections for county wide local food sales National/ global: meat and poultry processing; well serviced roads and connections through county	1862 Extension Land Grant: Texas A & M Funding: low Staff: low Interest: moderate 1890 Extension Land Grant: Prairie View A & M University Funding: unknown Staff: unknown Interest: unknown
US Virgin Islands Primary partner: Non-profit	Local production: self-sufficient, wild-harvesting, small scale specialty-crop production National/ global: peanuts, fish, rum (Cruzan Rum/ Captain Morgan)	Local: limited and unmaintained roads, limited access to barges and air transportation, limited access to animal processing facilities/ storage/ etc. – no access to specialty crop processing National/ global: distilleries, fish shipping	1862 Extension Land Grant: University of the Virgin Islands Funding: low Staff: low Interest: moderate

As mentioned, organizations listed in the survey were those that were perceived to be involved in natural disaster and COVID-19 response, as well as community food systems. However, when reviewing survey responses, we identified that the number of respondents who answered the question regarding usefulness of organizations in response to COVID-19 or natural disasters had significantly lower response rates than other questions. Table 4-6 details the comparison of participation across the survey. The decrease in response may be an indicator that individuals who participated in the survey are unaware about organizational efforts during natural disasters or COVID-19. It could indicate that organizations are not building awareness about their efforts and support.

Table 4-6: Research Participation and Response Rates for Natural Disaster and COVID Usefulness

NATURAL DISASTER- SURVEY REPSONSE				
COMMUNITY	RESEARCH PARTICIPATION	TOTAL PARTICIPATION	HIGHEST PARTICPTION	LOWEST PARTICIPATION
Alaska	35 survey responses, completion rate 1.5%	25 or 71% experienced a climactic event	21 or 84% of responses evaluated Borough Government	15 or 60% evaluated Dept. of Education, Dept. of Public Health, University of Alaska:
Arkansas	109 survey responses, completion rate 16%	79 or 72% experienced a climactic event	54 or 68% responses evaluated City Government	29 or 37% responses evaluated Benton County Extension
Iowa	35 survey responses, completion rate 5%	34 or 97% experienced a climactic event	26 or 76% evaluated City Government	15 or 44% evaluated Dept. of Agriculture, Education and Public Health; Iowa State University, Iowa State Extension, and Marshall County Extension
Texas	76 survey responses, completion rate 18%	71 or 93% experienced a climactic event	62 or 87% evaluated the City and County Government	40 or 56% evaluated Texas A&M
Virgin Islands	18 survey respondents, completion rate 3.8%	14 or 78% experienced a climactic event	11 or 79% evaluated the VI Department of Public Health and FEMA	7 or 50% of responses evaluated City or Borough Government
COVID- SURVEY RESPONSE				
COMMUNITY	RESEARCH PARTICIPATION	TOTAL	HIGHEST PARTICPTION	LOWEST PARTICIPATION
Alaska	35 survey responses, completion rate 1.5%	35 or 100% experienced COVID	21 or 84% evaluated Borough Government	15 or 60% evaluated Dept. of Education, Dept. of Public Health, University of Alaska:
Arkansas	109 survey responses, completion rate 16%	101 or 93% experienced COVID	82 or 81% evaluated City Government	48 or 48% responses evaluated the Food Conservancy
Iowa	35 survey responses, completion rate 5%	33 or 94% experienced COVID	30 or 91% evaluated City Government	18 or 55% evaluated Iowa State University, Marshall County Extension, and JBS
Texas	76 survey responses, completion rate 18%	60 or 79% experienced COVID	56 or 93% evaluated County Government	40 or 56% evaluated Texas A&M
Virgin Islands	18 survey respondents, completion rate 3.8%	18 or 100% experienced COVID	12 or 68% evaluated the VI Department of Public Health	7 or 39% of responses evaluated City Government and Research and Technology Park

Within natural disaster response, City and County/Borough government received the highest response rate with a range of 68-87% for all case studies except the Virgin Islands which

had Department of Public Health and FEMA as the highest response rate with 79%. The organizations with the lowest response rate for natural disaster usefulness varied by case study with response rates of 37% -60%.

COVID-19 usefulness saw similar participation numbers and connections to community organizations, with City and County/Borough government having 81-91% response rate for all case studies except the Virgin Islands which had Department of Public Health with a 68% response rate. Similar to natural disasters, the lowest participation ranged from 39% to 60% response rate across varying organizations, but predominantly State departments, Universities, and Local Extension offices.

To further understand usefulness of organizations, each individual ranked organizations based on their usefulness from extremely useless to extremely useful. To analyze this data a Likert scale was developed, giving extremely useless a score of 1 and extremely useful a score of 5. To analyze and compare usefulness across organization type, the average score from each case study is displayed in Table 4-7. Within the category of “community organization,” an average score for up to 5 organizations is displayed due to the number of organizations listed for each case study.

Table 4-7: Average Usefulness of Organizations for Natural Disaster and COVID-19 Response

Natural Disaster										
	Borough or County Government	City	DOA	DOE	DPH	University	University Extension	Local Extension Office	Community Organizations	FEMA
Alaska	3.76	3.88	2.71	2.67	2.93	2.67	3.06	3.17	3.07	
Arkansas	3.53	3.80	3.17	3.06	3.09	3.08	3.58	3.38	3.01	
Iowa	3.00	4.12	2.67	2.67	2.80	2.80	2.87	2.80	2.79	3.00

Table 4-7 Continued

	Borough or County Government	City	DOA	DOE	DPH	University	University Extension	Local Extension Office	Community Organizations	FEMA
Texas	3.52	3.63	2.80	2.39	2.78	2.63	2.80	3.13	3.41	2.83
Virgin Islands	3.86	2.57	2.40	2.50	3.64	3.00	2.78		2.64	4.55
Total Average	3.53	3.60	2.75	2.66	3.05	2.84	3.02	3.12	2.98	3.46
COVID-19										
Alaska	2.66	3.66	2.92	2.68	4.23	3.31	3.08	2.79	3.23	
Arkansas	2.85	3.40	3.16	3.10	3.94	3.31	3.54	3.40*	3.25	
Iowa	2.72	3.57	2.63	3.14	3.54	2.78	2.68	2.78	2.78	2.32
Texas	3.64	3.53	2.40	2.60	3.49	2.48	2.56	3.00	3.68	2.30
Virgin Islands	4.00	3.78	2.50	2.80	4.58	3.10	2.89		2.65	3.45
Total Average	3.17	3.59	2.72	2.86	3.96	3.00	2.95	2.99	3.12	2.69

Results and Discussion

The following section will discuss findings and comparison to literature. Organizational usefulness will first be discussed by natural disaster and then COVID-19. Each section will detail the comparison of usefulness across case studies and then highlight specific findings for each case study through qualitative research.

Natural Disaster Organizational Usefulness Review

When compared across case studies, no organization type received a *somewhat useful* (4) average score for natural disaster response (Figure 4-1). County/ Borough Government (3.60), City Government (3.53) and FEMA (3.46) were the top three most useful organizations identified by individuals. Departments of Agriculture (2.72), Education (2.86), and LGUs (2.84) had the lowest usefulness scores. This highlights the limited satisfaction of individuals with organizational response to natural disasters across case studies.

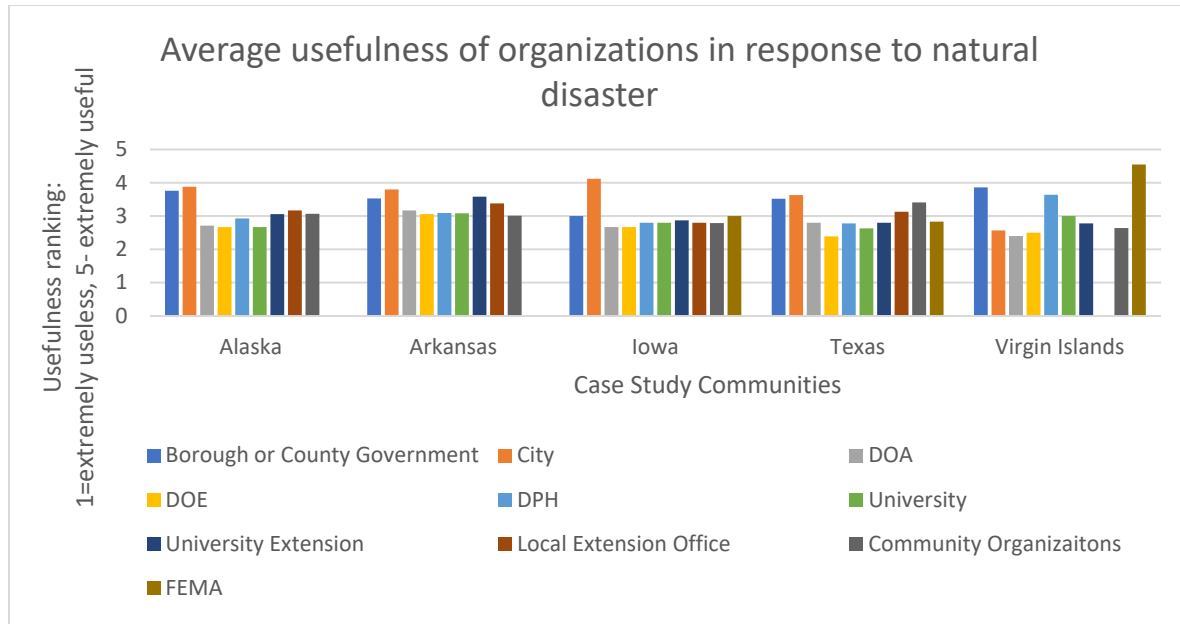


Figure 4-1: Average usefulness of organizations in response to natural disaster

Virgin Islands

Virgin Islands had the highest ranked organization, FEMA (4.55) as response to natural disasters. While individuals shared positive thoughts about FEMA's response, individuals interviewed had mixed perceptions. One individual shared, "it's one thing to have a hurricane, but FEMA process is very cumbersome; [it's] so difficult to keep getting funding and support...[it's] two years later [now] and most things are still on paper." This interview reflects the complex paperwork needed for recovery at both an individual and organizational level.

The Virgin Islands had both the highest and lowest of rankings for organizational usefulness. FEMA had the highest ranking, however, Department of Agriculture (2.4) and Department of Education (2.5) had among the lowest. This was also reflected through interviews and focus groups. In most cases, this was seen as a capacity issue. Some felt that the government simply "didn't respond," while others shared "[Department of Agriculture] needs a lot of support because [they] are understaffed and don't have the capacity to [respond]." This also included

concerns around Government creating policy, but then not having ability to respond due to capacity. Another interview shared that “Extension also isn’t at capacity anymore; they would be the most ideal but don’t have the staff for support.” While these organizations may be seen initially as the appropriate organization for support and response, it is evident that currently they may be unable to respond. Another concern mentioned around organizational usefulness within the Virgin Islands was top-down approaches for involvement for community. One individual shared, “extension is another organization that is going to have meetings that people should attend, but doesn’t have agendas and expects people to come,” and another individual mentioned “[the University and Extension] aren’t coming out [to farms] and offering support. They have their own agenda and are tied to other interests and not the individual farmers.” There were positive feelings as well about the University and Extension programming, but that seemed to be based on individual’s ability to get to training programs as well and specific topics, like food safety and research around pesticides.

Iowa

Iowa ranked City Government as a somewhat useful organization (4.12) in response to the derecho and tornado, while all other organizations were seen as neither useful or useless. City government was also highlighted in interviews, “[the] city went into action and contracted with tree removal services and worked all fall to get rid of debris. [The] downside was that there wasn’t a plan of what to do with trees (there was a mountain on the north end of town/ and there was scrambling to find land to rent the pile of wood).” Individuals also spoke about the city coordinating different jobs and efforts, so people knew how to help and where to go for support. Unlike the Virgin Islands, Marshall County, Iowa didn’t see FEMA as supportive, with a ranking of *neither useful or useless*. One individual shared “[we] learned the lesson after the tornado and have figured out how to be self-reliant, and then with another event like the derecho, [FEMA]

isn't always there. [FEMA] isn't going to save the day...[I] dread working with the federal government...[they] have a large bucket of paperwork that drains resources."

Additional comments in Iowa from natural disaster response included the need for response plans and building local resilience. When mentioning Extension, one individual shared, "they used to be a part of everything when I was a kid; and now I couldn't even tell you who works in the office. [There was] a focus shift 10-15 years ago and now [I] don't feel any support from Extension on [the] farm." This sentiment was also shared from another individual who mentioned, "farmers are not trusting [large commodity organizations] more than they are trusting Iowa State."

Texas

Texas had the lowest ranking of usefulness in response to natural disasters, with most organizations falling into the *somewhat useless* category and only four organizations within *neither useful or useless*. The Department of Education received a score of 2.39. Within interviews and focus groups, Bastrop County participants shared that due to the extreme fire in 2011, they learned about how to manage and coordinate emergency response. One individual shared, "[we] were more aware of emergency management planning due to the fire and implemented emergency management practices." The county also has an office of emergency management, one individual shared that "they used to have a website with lots of information, it could bring in another factor of food into the office that could help." This shows the opportunity for coordination with existing assets to better leverage resources and lift up community food system resilience.

Arkansas

All organizations in Arkansas were ranked within the *neither useful or useless category*. University Extension (3.58) received the highest ranking across each of the case studies, ranking

second in highest usefulness to City government (3.8). The moderate rankings within Arkansas may also be due to the lack of common extreme events that were identified in NW Arkansas. While many farmers and individuals mentioned early freezes, property flooding, and climate change, these types of environmental shifts may not have the same effect on individuals across the community. One individual shared about the need to have personal self-reliance, “[there is] no outside assistance needed. I plan and feel everyone should do so. Think! Don’t expect others to fix things for you.”

Alaska

Last, Alaska identified City (3.88) and Borough (3.76) government as the most useful organizations in response to natural disasters. All other organizations fell between a *somewhat useless* (2.67) and a *neither useful nor useless* (3.17). Regarding city and borough government support, like other case studies, individuals alluded to the fact that after experiencing numerous different types of disasters, emergency services were well equipped to respond. One individual shared, “emergency services worked hand in hand together, we started with the earthquake, then the fire, by the time we got to COVID, we had working so closely together. It was building us up to the ‘big one’ and we had so many partners.”

Each case study community faced unique challenges and considerations when responding to natural disasters. This was due to the difference in type of natural disaster that they each faced, capacity of organizations, and knowledge of who to turn to in the face of a natural shock. These conversations also highlighted additional individuals, organizations and businesses that are useful in response to natural shocks, including faith organizations, which was a common organization that came across case studies. One individual in Texas shared that, “churches led the way- they led the response.” A participant from the Virgin Islands “[gave] a shout out to faith leaders, [there were] so many [churches] did [their] best to not shut down pantries, soup kitchens,

and figured out how to keep operating.” Iowa partners talked about “several churches [worked] together to support and find out what people needed.”

COVID-19 Organizational Usefulness

When compared across case studies, no organization type received a somewhat useful average score for COVID-19 response (Figure 4-2). However, there were somewhat higher

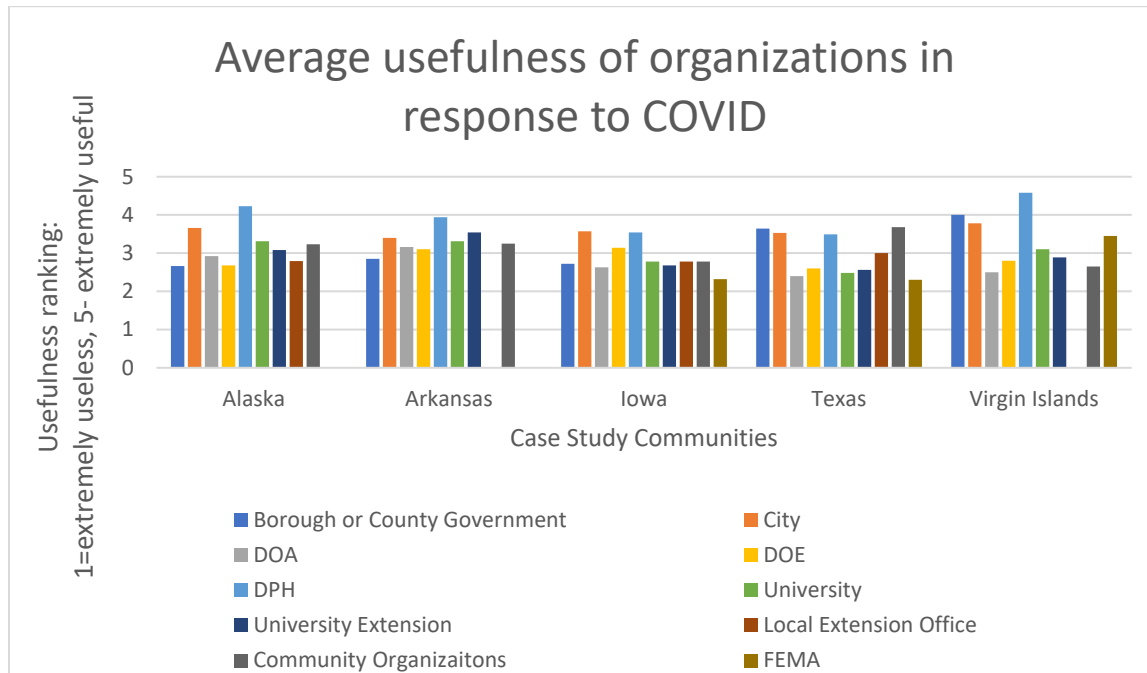


Figure 4-2: Average usefulness of organizations in response to COVID

usefulness scores than response to natural disasters, but no case study had an average of *somewhat useful* for an organization. Departments of Public Health had the highest-ranking for usefulness for COVID-19 response and increased almost a full point from their usefulness in natural disasters (moving from a 3.05 to 3.96). The Public Health Department in the Virgin Islands led with a of 4.58 and Iowa had the lowest ranked with a 3.54. Similarly, community organizations were also seen as more useful in response to COVID-19, moving from a 2.98 to a 3.12 on average. FEMA (2.69), Departments of Agriculture (2.72) and Education (2.86) had the lowest ranking of usefulness within COVID-19 across all case studies, with most ranking

between a somewhat useless score and a low neither useful nor useless score. FEMA dropped significantly in their perceived usefulness from a 3.46 for natural disasters to 2.69 for COVID-19. Virgin Islands, Alaska, and Texas had the most variable scores for usefulness across organizations; Iowa and Arkansas had more consistent rankings of organizational usefulness for COVID-19 response.

Virgin Islands

The Virgin Islands had the highest-ranking usefulness scores for Departments of Public Health (4.58), Borough (4) and City Government (3.78). However, from interviews and focus groups, there were mixed reviews about the response. One individual shared, “COVID crippled the government, just as [we] got our hopes up that things [were opening], COVID shut it down...the department is struggling from lack of funds.” Another individual shared that “government agencies pivoted quickly and addressed going virtual.” The Public Health Department, or Health and Human Services, “launched an inter-island food delivery program to help people that were at risk. They delivered food to their door. [However], they couldn’t figure out things like food stamps, who needs help, and couldn’t get partnerships for sharing.” Similar to responses from natural disasters, Department of Agriculture and Department of Education, as well as LGU and LGU-E were seen to not be as useful in response to COVID-19. Individuals shared that this was due to the inability to respond and lack of capacity.

Alaska

Alaska also ranked their Public Health Department (4.23) and City Government (3.66) as the most useful organizations in response to COVID-19. The city was mentioned as stepping up with grant programs, including PPP and outdoor dining support. Another individual shared that two cities provided “funds for food distribution, not just farm to family food box, but also grocery shacks full of shelf stable options.” Along with these efforts, non-profit organizations

were mentioned to have provided food access support. Cares Act funds from federal government passed through states and provided direct funding to the Department of Human Services and cities. Department of Education (2.68), Borough Government (2.66), and Department of Agriculture (2.92) received the lowest rankings for usefulness. Several spoke to the lack of funding support within the Division of Agriculture and also that they “did very little...and weren’t partnering.” Another shared that “the Division of Agriculture had a great food security micro grant program that was timely, but they got overwhelmed by applications and dropped the ball. No announcements have been made on the grant.”

Texas

Texas had a range of perspectives on usefulness for COVID-19 response, with the least useful organization, FEMA (2.3) as a low *slightly useless*, and Community Organizations as the highest (3.68) within a moderate *neither useful or useless*. Community organizations were highlighted in their ability to network and support with volunteers and food access. One individual shared, “Texas Center for Local Food did a great job of passing out and sourcing [food] boxes to schools, elderly, etc.”. Another shared that “Bastrop County Cares has been a large organization that established after the wildfire and are now a permanent non-profit...in COVID they created a volunteer program to staff vaccine clinics and are helping communicate information.”

Iowa

Iowa ranged in usefulness scores from the lowest with FEMA (2.32) of a low slightly useless and City Government (3.57) of a moderate neither useful nor useless. Organizations that supported little food pantries and food access were identified as useful organizations through focus groups and interviews as well, including emergency food boxes. A local meat processor, JBS, was also mentioned as helping keep people employed and being proactive with COVID-19

testing. Individuals also saw Marshall County Extension as a useful organization for sharing about different programming and pivoting quickly to online and zoom workshops. One individual shared that the Practical Farmers of Iowa organization provided a lot of resources as well, stating “their horticulture group was a fantastic resource. [There was] lots of chatter and webinars that were really helpful.”

Arkansas

Arkansas had somewhat higher perceptions of usefulness, with their lowest ranking of County Government (2.85) and Department of Public Health (3.94). Arkansas participants shared about the need to build relationships with new organizations during COVID. One individual stated, “everyone in the food space needed to scale up (equipment/ staff/ etc.); and then before the farmers to families food box (not a lot of local food showed up in these and heard that quality of food access to go up because of boxes); so many families thought that this was more consistent access in quality and variety.” Another participant stated, “[We] have [continued community collaboration] and believe that work is community based and community grounded—it is about feeding ourselves, and we do have physical needs--- at the end of the day, the relationships make and break how we are able to do that.”

Planning Support for Resilient Community Food Systems

The comparison across organizational usefulness, and ability to respond in COVID-19 compared to natural disasters, highlights the needs for collaboration and coordinated efforts. Each organization has different abilities to provide support to communities in their efforts to plan, rebuild, and recover after a significant shock. As detailed, planning practices, coordination, and network and relationship development are necessary to mitigate disaster and foster resilience. This included identifying strategic partners and building capacity. Individuals across each case study mentioned changes in organizational capacity and budgets that led to concerns in

community development patterns and capacity for work. Climate change was also addressed as a significant concern overall, from individuals in Alaska mentioning drying of peatland and forest fires happening more frequently, to groups in Iowa speaking to the number of natural disasters that have occurred back-to-back. Identifying practices that may support efforts to mitigate impacts of these climate changes are necessary. When considering potentials for organizations to increase their usefulness in the arena of RCFS, we identified three primary areas of work: building trust and collaboration, providing support for strategic planning, and conducting research and outreach with best practices for mitigating impact and developing resilient community food systems.

The Role of Land-Grant University Extension

LGU and LGU-Es on average ranked as neither useful nor useless. Additionally, they had low response rate for usefulness, with an average response rate of 55-57% for natural disaster usefulness, and 51-61% for COVID-19 usefulness. This may indicate that individuals are unaware of their programming or response efforts in these areas and did not feel they had enough information to rate the usefulness. It may also indicate that LGU and LGU-Es are not participating in response and therefor individuals did not rank them.

When considering LGU-Es role, it is believed that their needs to be an effort to build relationships, trust, and collaboration both internal to LGU and LGU-E as well as with community partners. This relationship development could enhance the awareness of LGU-E programming among external partners, as well as inform LGU-E staff and faculty on community needs, including RCFS. If staff capacity and expertise exist, LGU-E also can help communities with necessary research and programming related to best practices for mitigating impact and developing resilient community food systems. While not all LGU-E has staffing, funding, and interest in RCFS, some LGU-E may be well-suited to also help with facilitation and strategic

planning support. However, this area will require both expertise and trust within community. To further emphasize these components, each is described in detail below.

Building Trust and Collaboration

To stay relevant, it will be important for Extension to not follow the status quo, and to consider the evolving needs of communities (Franz & Cox, 2012). This was identified as a strategic need in 2012, and Extension is still struggling, at large, to provide relevant options in cross-disciplinary work like food systems. Local organizations are a key element in resilient community food systems and promote avenues for participation in response from community citizens (Sharp, Jackson-Smith, & Smith, 2011). One way to ensure relevance is building relationships and trust with community partners. For example, an Arkansas focus group shared “[we] saw that coordination and collaboration is really key, especially in space of a natural disaster.” Hand in hand with relationships is continuing practices of intentional outreach and collaboration. Another individual in Arkansas shared, “the biggest complaint about Extension is they don’t show up unless asked, and they are there when you call, but [they] don’t go out of their way to step in and ask how to help or create new programs to respond and be proactive.” LGU and LGU-Es need to work on relationship development with communities prior to disaster so community members view Extension as a valuable resource and trusted partner. Through relationship and community discussions, growth of programming can occur. One example of this is between LGU-E and a non-profit organization in Texas. An individual shared, “[youth programming] has been an uphill battle, to find areas to work with kids and understanding the garden...the [non-profit] has been a lighthouse [for this work] and working with extension services has been wonderful.”

Research and Outreach – beyond traditional agriculture

The second identified area for LGU-E support is the natural connection between research and outreach. As mentioned in the introduction, LGU and LGU-Es have historically focused on agriculture. One individual in Arkansas shared that they have concerns because, “farmers sometimes think that Extension is in the pocket of big ag.” LGU-E has the potential to leverage their resources and expertise to transdisciplinary approaches (Copeland, 2022; Kopp, 2021). To do this authentically, LGU-E will need to be intentionally engaged, avoid mission creep, and stay through community changes. For example, a partner in Texas shared that while “Extension is a nimble organization that responds to needs, there are some concerns with whiplash because [they are] always responding to [perceived random] things or just having [their own] Extension [programming]” rather than being involved in collective community efforts. This was echoed in Arkansas, when an individual shared, “[Extension] is charged to work on other things and there is a challenge to balance the work and the mission. They have lots of different duties” and are pulled in many directions.

There are multiple areas of research that connect to the goals for RCFS and LGU and LGU-Es. For example, a partner in Texas shared, “[we] work most closely with Texas State with their small producer’s initiative and did a research project with [a faculty member] that was helpful. [However], generally the programs that are at the state land grant university (A&M) don’t or aren’t hitting the same demographic of specialty crops/ organic/ mixed produce, [that we are looking to support].” Another individual in Texas shared that, “[we] could benefit from more TA / finance/ etc. that are more available to small farmers and specialty crop growers.” Additional areas of support are around research for response and technical assistance for resilience. A participant in Iowa shared that “[we had] no consistent messaging, no best practices, etc. for how to respond to [natural disasters], but we have fair boards, conferences,

FFA / 4H programming etc.” that could be great places to share resources and information. Being able to provide research and relevant information that is timely and accurate will help farmers, organizations, and communities at large respond. However, as an individual in Alaska shared, “there is a need to have real, useful connections and feedback with the farmers...[research and programming can be] helpful but time is limited and things are not moving as fast as the growers.”

Strategic Planning and Facilitation

Last, in addition to relationships and technical expertise, offering support for strategic planning and facilitation capacity is a potential for LGU-E (Sitaker, Kolodinsky, Jilcott Pitts, & Seguin, 2014). Communities can lack experience, professional development, and jobs that focus on the ability to support food systems resilience (Long & Hohenshell, 2019; Sibilly-Brown & Long, 2019; Long & Hamideh, 2018). Several different types of capacity needs exist, and include resource, organizational and facilitation, programmatic, network, and political capacity (Glickman & Servon, 1998). Wilkinson discusses additional roles that community facilitators have regarding five different fundamental conditions that assist in social well-being and participation: distributive justice, open communication, tolerance, collective action, and communion, or celebration of community (Korsching & Davidson, 2013). While not all LGU-Es may have the capacity, interest, expertise, or trust with community to provide strategic planning and facilitation, it may be an area to grow in and evolve. For example, LGU-E has transdisciplinary program embedded into their work through existing programming and research in community economic development and cross-sectoral departments of agriculture, human sciences, and youth connections (Tobin, Radhakrishna, Chatrchyan, & Allred, 2017). If there are opportunities to engage, LGU-E could provide support for creating networks, facilitating strategic planning for RCFS, and provide technical assistance where areas of expertise exist

within LGU faculty or LGU-E staff (Kopp, 2021). While assessing and facilitating strategic plans, organizations can develop response plans, including locations for individuals to go during a disaster. In the Virgin Islands, one individual shared that “[Extension] has done a lot of grant-making since the storms, and we see them step up for the community by offering their facilities.”

In addition to planning with collective community organizations for RCFS and disaster response, planning internally, across the University and Extension should also be pursued. In Marshall County, Iowa, there were elements of county staff feeling abandoned by their colleagues within the broader LGU and LGU-E system after the disaster. An individual shared, “[we] felt that at the end of [the response], Marshall County [Extension] was left on their own. [We] had [multiple] staff out with damage....we didn’t hear from another [University] person for 6 days, [and when they reached out, it was about] what [we] were doing to help people in [our] community.” In this case, LGU-E county staff felt pressure to respond to the community, however, were also in a state of recovery and thus were unable to respond. LGU and LGU-E campus faculty and staff missed an opportunity to support the county partners in their recovery both as an office and within the community. This experience alludes to the need for strategic plans for LGU and LGU-Es to determine how to support each other, and the community at large. This includes the need for different response plans based on if organizations are internal or external to where the disaster strikes. When within the disaster zone, LGU-E county and local staff may need to focus more heavily on personnel and office recovery. Staff and organizational capacity outside of the disaster zone can provide support and response following the shock. This type of planning effort can also go beyond the state and include identifying partner agencies and organizations that will support with response outside of the region. Another example is the relationship between Iowa and Virgin Islands. Iowa was able to support Virgin Islands in their

response to the hurricanes in 2018. A partner organization in Virgin Islands identified a need to understand the impact and stories from farmers and residents. Iowa State was able to provide capacity and compassion to those that had gone through the natural disaster. Another example about having networks within and external to the disaster zone is that of Bastrop, Texas Lost Pines Fire in 2011. Farmer networks helped provide hay from outside the disaster zone so livestock could still have feed.

Conclusion

Support and technical assistance are needed to fully assess, understand, and develop resilient community food system (Himanen et al., 2016; Clancy, 2017), including research across food systems sectors such as production, processing, and general supply chain activities, and community capitals as well as critical equitable considerations (Winter-Nelson, 2016; Clancy, 2017; Galt et al., 2012; Sitaker et al., 2014). While challenges and changes of LGU-E are ongoing, including alignment with communities, acknowledgement of history and equity, LGU-Es are still equipped to collectively respond, with community partners, to needs around RCFS. LGU-Es are uniquely positioned to respond to place-based food systems education due to their transdisciplinary nature that includes community engagement and community-based learning, lifting up the need to respond to all populations (Galt, Clark, & Parr, 2012; Copeland, 2022). However, to do these activities successfully, LGU and LGU-Es should identify ways to

1. Build trust and relationships with community members, including increased engagement across areas of food systems, community development, resilience, and preparedness.
2. Enhance transdisciplinary research and outreach methods that respond to community needs, which may include disaster response for farm and food businesses, resilient community planning, and food access methods.

3. Step up, support, and facilitate strategic planning efforts, including identifying existing assets and limitations, and developing strategies for preparedness, response, and recovery across the community. This should include identifying roles of organizations both internal and external to disaster zones.

Across each of these identified LGU-E efforts, enhancing overall capacity through staffing and sustainable funding sources will be necessary. For example, an individual in Alaska shared, “[Extension] has absolutely shown up, but when we go back to our budget cuts, because of the way funding has changed [in our State], we can no longer [continue the same programming].” Finding ways to encourage growth in staffing and sustainable funding will provide enhanced capacity for LGU-E to provide programming and technical assistance. Given the changing dynamics of community, climate, and agriculture, the time is now to act on these changes. Additional research is needed to fully assess the types of research topics and programming methods that are place-based and most desirable by community and population. Given the urgency for change, we must act soon to support our communities.

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Appendix A. Approval for Research (IRB)

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Ethics
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 12/23/2020
To: Courtney Long
From: Office of Research Ethics
Title: Extension's Role in Supporting Resilient Community Food Systems in the United States
IRB ID: 20-471
Submission Type: Initial Submission **Exemption Date:** 12/23/2020

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

A modification was made in 10/04/2022 with approval shown below.

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Ethics
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 10/04/2022
To: Courtney Long
From: Office of Research Ethics
Title: Extension's Role in Supporting Resilient Community Food Systems in the United States
IRB ID: 20-471
Submission Type: Modification **Exemption Date:** 10/04/2022

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

CHAPTER 5. GENERAL CONCLUSION

This research identified the complex intersections between communities, food systems, resilience, and community actors. Based on the place-based aspects of communities, each responds to shocks differently and has varying capacity across community capitals. Building trust across organizations and creating strategic efforts to work together in planning, mitigation, response, and recovery in the face of disasters and shocks can support having more resilient food systems. Assessing existing community capitals and their connection to food systems, as well as visioning for the future will help communities identify key pathways forward. However, ensuring that both planning and action occur will be necessary. Within this dissertation I presented results from literature review, interviews, focus groups, and surveys. The research resulted in a suggested framework for assessing resilient community food systems, understanding the intersection and conflict of individual values and behaviors, and potential roles for Land-Grant University Extension as well as other organizations to increase resilience for community food systems. Briefly I will describe findings from each chapter and suggested next steps.

Chapter Review

Chapter 2: Resilience, Adaptive Capacity and Transformation: A review of five case studies to assess place-based qualities community food systems and their state of resilience

Resilience planning, including the ability to prepare, respond, and recover is of the utmost important in this era of increased incidence of disasters (Smith, 2022; Nelson, Zak, Davine, & Pau, 2016). Both natural and human-made disasters impact individuals, families, and communities nationwide, and range in impact from loss of life and financial burden to food access constraints and loss of employment (Smith, 2022). After reviewing food systems, community capitals and resilience frameworks, it is believed that understanding and assessing

pre-conditions based on each area will help communities understand their level of resilience, adaptive capacity, and need for transformation (Olshansky, Hopkins, & Johnson, 2012; Walker, et al., 2006). After literature review, a conceptual framework of the intersection between resilience, community capitals and food systems was developed and utilized to assess five case study communities. This initial framework was revised through the research study where individuals identified community assets and gaps that connected with food systems, resilience, and community capitals. Capitals that most frequently included successful examples of resilience were social, built, and natural capitals. Social related to adaptive capacity and the ability for groups or networks to respond and act immediately. Built capital was more frequently discussed regarding creating sound infrastructure choices, having transportation routes and logistics planning, and proper equipment, storage and building infrastructure for farm and food businesses. Built and natural capital frequently overlapped because of the complexity of planning systems and ensuring that natural and native ecological systems are protected. This could include preserving waterways and land, as well as supporting diverse and ecologically friendly production practices.

Limitations were identified in areas of natural and built capital, political environment, and lack of leadership to think through and act for future generations. It is suggested that the resilient community food system framework and assessment could identify points of vulnerability, track levels of resilience and adaptive capacity, and determine if transformation is needed. With this framework, communities could better prepare, plan, and respond when a disaster occurs. If they act on the findings from the assessment, they can create potential pathways for more resilient community food systems in the future. One way to encourage action

is by building awareness of efforts and increasing community participation in both resilience activities and food systems.

Chapter 3: The connection between community assets, individual values and participation in community food systems

Individuals are a central tenant of a community food system. Every individual has different values and perspectives that impact their decisions (Cairns & Johnston, 2018; Milani Marin & Russo, 2016). The chapter compared interviews, focus groups and survey data regarding to specific questions on community and individual values, individuals engagement in community activities, and perceived importance of food and farm businesses and consumer shopping patterns. Additionally, it included individual understanding of local food and farm businesses and involvement with, and concern for, transdisciplinary aspects, shown through a comparison of community capitals (environment, economy, social, built, human, cultural, and political capitals) (Flora & Flora, 2008).

It was found that individuals support and value local food and farm businesses; however, they do not always act on these values, which is also a common finding in food purchasing studies (Norvdall, 2014). Social, cultural, and natural capitals were the most prominent mentioned as assets and values of the community. However, when reviewed by individual values, the most agreed upon values were environment and education. All communities except Iowa had environment ranked as one of the top two values. Marshall County, Iowa viewed environment as one of its lowest values, ranking 11th in importance. A significant finding from this research was the cognitive dissonance, or disconnect between perceived value of local food and farm businesses and the action to purchase local products (Ong, Frewer, & Chan, 2017)

One avenue to help shift behavior of consumes is to identify ways of making local and regional food purchasing an easy and convenient choice. With this shift, comes building

awareness of community food systems practices and sharing the story of the ways in which individuals can shop and participate in RCFS. To do this, it will also take supporting local food and farm businesses in their ability to change their business patterns. This may mean different direct-to-consumer markets, processing options for fruit and vegetables, or scaling-up to meet wholesale demand. It will also include policy change and leadership to advocate for community food system practices, beyond industrial and global incentives. Encouraging individuals to become active in their community food system, as well as investigating local, state, and federal policies could assist in changes for engagement in food systems.

CHAPTER 4: Connection to Liberation Extension: the role of Land-Grant University Extension in Supporting Resilient Community Food Systems

Land Grant Universities have the potential to be a key partner RCFS if they are able to better connect and build trust in the communities they serve. This could be done through offering relevant and community-based research and programming related to community needs in the areas of RCFS. An additional potential is to provide facilitation and strategic planning efforts, if they can repair relationships with community members, particularly small and non-traditional farmers and farming communities. To create resilience, diverse and collective collaboration across areas of planning, preparing, and responding is necessary. This chapter identified several different organizations that may be useful in developing RCFS, however, was specifically interested in the role of Land-Grant University Extension (LGUE).

The primary argument of the chapter is that LGUEs can improve capacity for RCFS through technical assistance and community capacity support, however, this is only true if trust can be developed between community actors and LGUs and LGUEs. Findings suggest that LGUE must increase their trust and collaboration within communities, listen, and actively support based on community needs (Copeland, 2022). As trust is re-established, then LGUE may

be well suited to provide technical assistance and strategic facilitation and planning for resilient community food systems. An additional potential is utilizing the framework developed in Chapter 2 for assessment, facilitation, and implementation around resilient community food systems. Last, it was identified that LGUE need to incorporate more transdisciplinary programming and community projects that respond to the systemic needs of communities (Copeland, 2022; Kopp, 2021).

Limitations and Future Work

Much of this research focused on qualitative findings and utilized survey results to indicate individual perspectives. While the survey assisted in understanding broader community participation, particularly of those who many not already be engaged in RCFS, the survey did not have high participation and was thus not generalizable.

There are numerous studies underway regarding resilience and food systems, especially considering COVID-19. It should be encouraged that these studies are aggregated and reviewed regularly as they are being done concurrently and could lead to additional findings.

This research focused on systems approaches to understanding complex areas of food systems, resilience, and community values. There are opportunities to investigate more detailed and specific components within this rather than the broad frame used to assess the intersectionality. Next steps from this research could include:

1. Testing the new conceptual framework for assessing RCFS. This could be piloted more in depth with communities, including developing specific metrics related to each indicator.
2. Sharing of findings with food and farm businesses and holding technical assistance programs related to values and buying patterns. Teaching about how to increase

- consumer understanding and connect their values to their food purchasing patterns could be beneficial.
3. Overall, this shows a high need for LGUE to become more relevant and trusted partners. LGUE should determine appropriate strategies to engage and listen to needs in community for this transdisciplinary work.
 4. Develop strategies across LGU and LGUE to assess their disaster response plan, including both internal and external support. This could include planning locally and regionally, both within the University system as well as the broader community.

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