

Supporting resilient food systems: Navigating challenges in U.S. rural communities

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Abstract

This study examined how food systems in rural communities developed resilience during the COVID-19 pandemic. Using a qualitative research design, we conducted semi-structured interviews with purposive community key informants (CKIs)


in rural communities (designated a RUCA code 7 and higher) across 13 U.S. states. CKIs across five sectors (education, food, healthcare, family-service, and Extension) were interviewed, and 38 met the study inclusion criteria of discussing organizational


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connection to the food system during their interview. Interview questions explored partnerships, supports, challenges, and organizational lessons learned while navigating the COVID-19 pandemic. The research team used a collaborative and iterative approach to coding the interview transcripts. After inductive coding, codes were grouped by similarity and alignment with theory-driven organizational action to identify themes specific to food systems. CKIs shared strategies to address rural food needs that were shaped by factors such as rural community stressor, conditions and characteristics, formal and informal community network structures, social capital, community capacity, and rural food systems resilience. The findings highlight the capacity of rural community organizations to collaborate to enhance food security during a community stressor. It is crucial for rural food systems to integrate these insights and strategies into their practices to effectively prepare for and tackle future challenges.

Keywords

rural communities, family, food supply chain, resilience, food systems, COVID-19, pandemic

Introduction

Food security is a pressing global challenge that profoundly affects individual well-being, chronic disease risk, family dynamics, and community vitality, especially for rural families (Gregory & Coleman-Jensen, 2017). It is defined as “all people, at all times, having regular and reliable physical, social, and economic access to sufficient safe, nutritious and culturally relevant food that meets their dietary needs and food preferences” (Gallegos et al., 2023, p. 1990). Resilience, or the ability to adapt, recover, and sustain food security initiatives despite adversities and changing circumstances, is critical to navigating community stressors. The

food system is a complex interconnection between organizations and stakeholder groups and their interlinked value-added activities, such as production, distribution, processing, consumption, and disposal of food products (Kanter et al., 2015; von Braun et al., 2021). Together, these partners can be a driving mechanism for food system change toward sustainable food security, especially during times of food system stress. Professionals in rural communities already have a multiplicity of roles, serving as a “jack of all trades” (Chisengantambu-Winters et al., 2024). The COVID-19 pandemic was a systemic community stressor experienced across the world, with distinct challenges presented to rural communities and families. Leading scholars emphasize the importance of understanding drivers of systems’ resilience, particularly in terms of how rural food systems navigate health shocks (Conner et al., 2023; von Braun et al., 2021).

When the food system falters from community stressors, families’ household food security may experience immediate and long-term consequences. While all families may be affected by food systems volatility, families experiencing household food insecurity may face increased risk for immediate hunger or malnutrition (Gallegos et al., 2023), as well as reduced job productivity or educational attainment. Without adequate nutrient intake throughout life, individuals are at high risk for nutrition-related chronic diseases, mental health challenges, and higher mortality rates across all categories (Gallegos et al., 2023; Gregory & Coleman-Jensen, 2017). Ensuring that food systems, emergency or otherwise, are resilient and can withstand turbulent times is essential to support and maintain a healthy society (Mustafa et al., 2021).

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Even without community stressors to the food system, rural communities experience a higher risk for food insecurity and subsequent health impacts than their suburban counterparts (Rabbitt et al., 2024). Across multiple classification systems, rural areas generally describe nonmetro, or nonurban, areas based on comparatively lower housing and population density (U.S. Department of Agriculture, Economic Research Service [USDA ERS], 2025). While some have concluded that rural living can be a protective factor of food security (Carter et al., 2014), recent household food security reports have noted that food insecurity is more prevalent in rural communities compared to the national average (Rabbitt et al., 2024). The pandemic exacerbated both geographic and socioeconomic disparities facing rural communities and their household food security (Feeding America, 2021). Although rural communities may face disproportionate food insecurity and subsequent health challenges (e.g., nutrition-related chronic disease), the literature is mixed related to factors that contribute to or reduce this burden.

While agriculture and food production are often associated with rural communities, this does not always translate into food access within the community (Carter et al., 2014). Many rural communities face limited food choices and higher food costs than their urban counterparts (Rodriguez & Grahame, 2017). Rural communities have to navigate limited access to fresh, affordable, and high-quality, nutritious food due to greater distances to grocery stores, lack of reliable transportation, and weaker infrastructure supporting food delivery systems (Kendall et al., 2019; Byker Shanks et al., 2022). Additionally, rural families are more likely to encounter challenges with delivery or access to social services, fewer civic organizations, unemployment, lower earning potential, inadequate housing, and longer travel times for work, further exacerbating food insecurity (Bowen et al., 2022; Kent et al., 2022; Rodriguez & Grahame, 2017). Community stressors, and natural, economic, or health disasters, impact rural food systems (Puma et al., 2015). During the COVID-19 pandemic, rural food systems had serious supply chain disruptions (Haney et al., 2022; Kolodinsky et al., 2020). Agricultural workers were often considered front-

line workers, not able to do their jobs from home, leading to infections and disruptions in the workplace and across the food supply chain (Bochtis et al., 2020). In contrast, many communities saw increases in home- or community-grown gardens, online food shopping opportunities, and in home cooking, protecting against food insecurity challenges (Pryor & Dietz, 2022). With disruption comes an opportunity to identify organizational practices that sustainably reduce risk, especially among rural family-serving organizations that are left vulnerable.

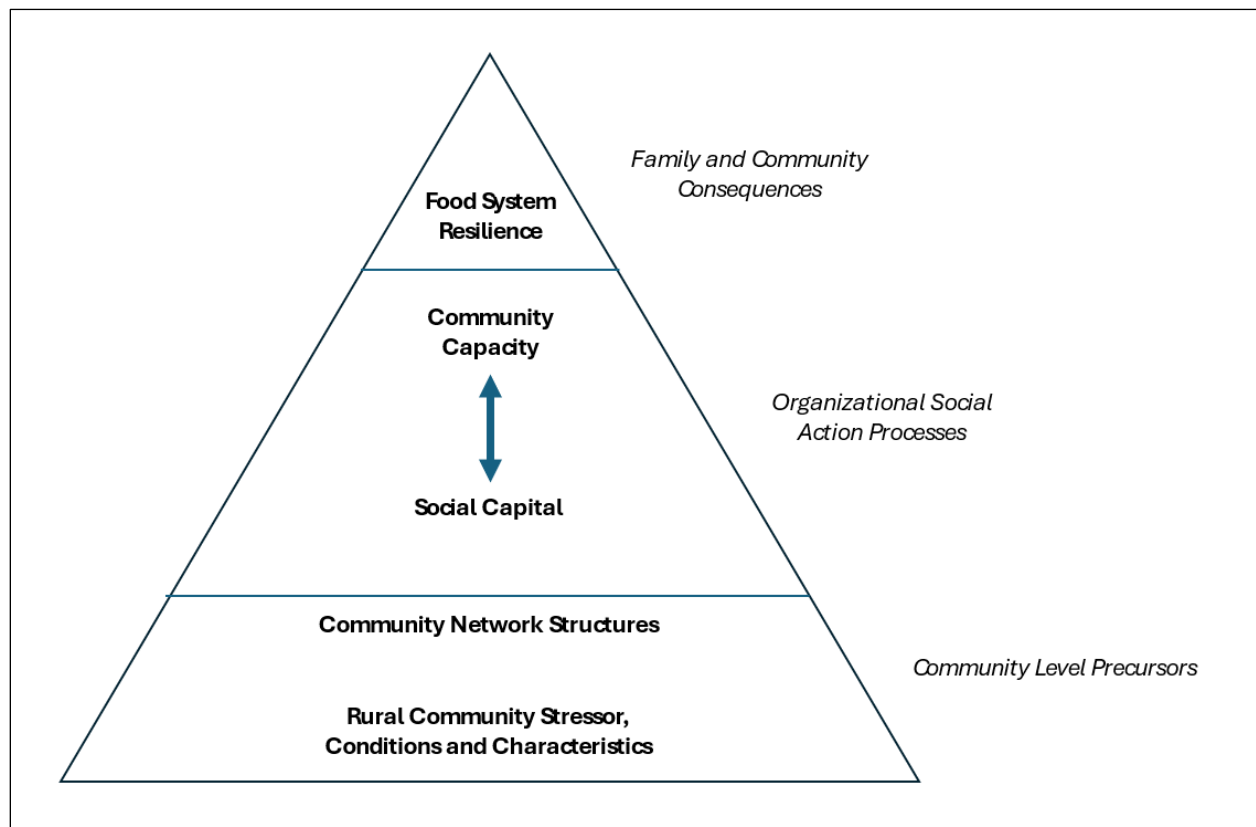
Community-based efforts to address food insecurity have highlighted opportunities to increase food access in rural communities through social and physical environment support across the food system (DeWitt et al., 2020; Kolodinsky et al., 2020). Broadly, food systems can be defined as supporting community well-being through a multi-sector network across the food cycle, including production, distribution, consumption, regulation, waste management, and environment (Sambell et al., 2019; von Braun et al., 2021). Within each sector, there are diverse organizations and individuals working toward a functional food system. Research has begun to develop supportive strategies for identifying and increasing food systems resilience through expert consensus, identifying seven core themes, including agricultural and ecological sustainability, community health related to food security, community self-reliance, distributive and democratic leadership, focusing on the farmer and food maker, food justice, and place-based economics (Campbell et al., 2022). More research is needed to understand the transferability of these expert-identified themes to the experiences of organizations navigating food systems, particularly those in rural communities supporting household and family food security.

The social organization theory of action and change suggests a framework for understanding how communities navigate adversity toward a desired result of supporting local families (Mancini & Bowen, 2009). Just as family systems are interconnected and reciprocal networks of individual members (Kim-Appel & Appel, 2021), community systems are complex networks of dynamic formal and informal organizational and individual inter-

connected relationships (Mancini & Bowen, 2009). This social organization theory suggests that for community systems to adapt to adversity, such as a local or global pandemic, community networks must (1) unite around a shared responsibility or concern for the well-being of their community, and (2) use collective competence to seize opportunities and confront the community stressor. The readiness for action and interaction across these networks in these two areas generates social capital. Specifically, this social capital is realized through information exchange, transactional reciprocity, and trust between network members. Together, social capital and community capacity across the network partners and within the context of the stressor build toward system resilience to navigate a community stressor and support family well-being (Mancini & Bowen, 2009). The social organization theory of action and change visualizes these concepts (Mancini & Bowen, 2009; see Figure 1).

To further understand how food system networks function for families in times of stress, we sought the perspectives of community key informants (CKIs) from organizations in rural communities that experienced the COVID-19 pandemic. This qualitative study examined how rural food systems developed resilience within the social organization theory of action and change. By focusing on organizational actions and adaptations during adversity, we identified locally aligned strategies to prepare for future chronic or acute stressors. Using these study findings, local leaders and community networks can build toward shared responsibility and collective competence to effectively meet rural food system challenges. Ultimately, these findings may inform evidence-based strategies to foster resilient food systems in underserved, rural communities, promoting sustainable food security and improving the quality of life for all residents.

Figure 1. Social Organization Theory of Action and Change



Source: Adapted from Mancini & Bowen, 2009.

Methods

We used a qualitative research design for this study. Our team, including graduate student researchers and a faculty principal investigator at Kansas State University, conducted semi-structured interviews with CKIs from organizations that serve rural areas. CKIs provided verbal consent to join the study and were offered a gift card to compensate them for their time and expertise. Interviews were conducted and recorded via video chat, and video files were later transcribed verbatim. To protect confidentiality, we replaced the names of the CKIs, their organizations or places of employment, and community-identifying information with pseudonyms before analysis. Exempt limited ethical approval for key informant interviews was obtained from the Institutional Review Board (IRB) at Kansas State University as the primary data collection site, with additional participating institutions approved by the IRB for de-identified analysis.

Participants

For this study, we defined “rural” using Rural-Urban Continuum Area (RUCA) code 7 and higher (where 7 represents a small-town core within an urban cluster of 2,500 to 9,999 population, excluding micro or metropolitan communities [USDA ERS, 2020]). CKIs from partner organizations were identified in respective rural communities by Cooperative Extension and university researchers collaborating on a USDA National Institute of Food and Agriculture (NIFA) Hatch project, NC-1171: Individual, family, and community factors associated with resilience in diverse, rural, low-income families. Research collaborators identified organizations and/or individuals across five sectors (e.g., food, healthcare, family service organizations) supporting rural, low-income families. Similar to Conner et al. (2023), we heard perspectives from a wide range of CKIs from organizations that interacted within their rural food system. Expanding on previous studies, the organizations and their respective reporting CKIs were identified for their organization’s mission to serve rural families, not specifically their role within the food systems. CKI interviewees (38 of 41 total) who specifically discussed a connection between their work and some

aspects of the food system were included in further analysis. Graduate research students at Kansas State University contacted CKIs to recruit them for virtual interviews, with multiple attempts made to contact each participant as needed.

Phenomenon of Interest

The interview protocol was developed by a diverse team of research and outreach professionals from academic institutions involved in the multistate Hatch project NC1171 (see protocol in Appendix A). The semi-structured format included broad, open-ended questions about CKIs’ professional experiences in their rural communities during the pandemic, alongside prompts to elicit deeper insights. Sample questions included: “What lessons have you learned over the past year about your ability to effectively serve families in your community?”, “How have partnerships between you and other community resources changed since the beginning of 2020?”, and “What has changed about how you meet families’ needs since the beginning of 2020?”

Reflexivity

Reflexivity was considered throughout data collection and analysis. As graduate research assistants studying health and human development, the interviewer and preliminary coders had no prior relationship with any key informants. Research and Extension faculty authors contributed to the research design and protocol development, bringing diverse expertise across fields related to rural families. Some authors, including the lead author, have professional and personal experience in rural communities, particularly in interactions with community food-systems organizations.

Analysis

To gain deeper insights into CKIs’ perspectives and experiences across the organizational system, a subset of our research team employed a collaborative, iterative approach to coding transcripts. Initially, team members read the transcripts multiple times to become familiar with the data. We built an inductive coding list collaboratively, applying one or multiple codes to transcript segments to ensure contextual understanding (MacFarlane, & O’Reilly-

de Brún, 2012; Saldaña, 2015). The team identified shared codes and definitions through consensus coding of all segments and transcripts.

Following inductive coding, the research team reviewed initial codes aligning with the research questions and theoretical factors. To ensure rigor and coherence, each interview had primary and secondary reviewers reassess codes considering deductive themes. We used criteria outlined by Saldaña (2009, pp. 50–51) to assess the appropriateness of theory-driven coding (see also Saldaña, 2015), finding strong alignment between organizational theory and our research questions. This approach facilitated a practical and meaningful analysis.

Subsequently, the team met multiple times over several weeks to discuss identified codes and potential theory-driven themes. We excluded three interviews from the original 41 as they did not discuss any aspect of the food system. Our analysis considered examples and counterexamples of attitudes and perceptions toward organizational resilience, providing a nuanced understanding of how derived themes shed light on processes in rural food systems. Overall, our methods and analysis processes were comprehensive, actively involving the research and data collection teams to ensure a robust and well-grounded analysis.

Results

A total of 41 CKIs from 13 states across the West, South, and Midwest regions of the U.S. participated in the interviews, with 38 meeting the criteria for inclusion in this study. Table 1 shows the breakdown of the 38 CKIs by organizational sec-

tors, including the geographic region of the county and percent of CKIs representing counties at or above the household food security national average. Approximately one-third of the CKIs were associated with organizations dedicated to enhancing families' food security (e.g., food banks, government food assistance programs). Twenty-one percent of the CKIs were employed with organizations providing general resources to community members (e.g., Cooperative Extension), 18% belonged to specifically family service organizations, including child and/or family services, youth organizations, and kinship programs, and 10.5% worked in the healthcare sector (e.g., community health clinics). All CKIs involved in this study worked in organizations connected to a food-system network and were located in communities designated with a 2020 RUCA code of 7 and higher (USDA ERS, 2020). The average food-insecurity rate of the communities in this study (13.0%) was slightly higher than that of their respective states (11.0%).

The CKIs shared their experiences that influenced their service and interactions with their communities as they attempted to meet food needs during the COVID-19 pandemic. Their experiences revealed that community resilience is not a static but rather a dynamic process. Social service organizations, community members, families, and individuals adapted to challenging situations and collectively took action to achieve positive outcomes for their community. Below, results are organized by the elements of the social organization theory of action and change as seen in Table 2.

Table 1. Community Key Informants' (CKIs') Sectors and County Demographics (N = 38)

Organizational Sectors	Total CKI Represented	County Geography			County above National Avg. (13.5%) Food-Insecure Households
		Midwest	South	West	
Sectors	% (n)	% (n)	% (n)	% (n)	% (n)
Food-Related	34.2 (13)	23.1 (3)	23.1 (3)	53.8 (7)	30.8 (4)
General Resource	21.1 (8)	25.0 (2)	37.5 (3)	37.5 (3)	62.5 (5)
Education	18.4 (7)	14.3 (1)	14.3 (1)	71.4 (5)	28.6 (2)
Family Service	15.8 (6)	33.3 (2)	16.7 (1)	50.0 (3)	50.0 (3)
Healthcare	10.5 (4)	0	25.0 (1)	75.0 (3)	75.0 (3)

Table 2. Themes and Subthemes from Community Key Informants (CKIs)

Theme	Subthemes: This theme was impacted by ...
Rural Community Stressor, Conditions and Characteristics	Rural Context
	Available Funding
	COVID-19 Created Conditions
Formal and Informal Community Network Structures	Coordinating Hub Organizations
	Partnership around Aligning Mission
	Leveraging Interpersonal Relationships
	Forming Usual and Unusual Partnerships
Social Capital: Information, Reciprocity, and Trust	Exchanging Information towards Community Capacity Building
	Ability to Provide Reciprocity
	Producing a Sense of Trust
	Considering Cultural and Historical Context
Community Capacity: Shared Responsibility and Collective Competence	Pursuing Shared Goals and Audience
	Collective Ability to Mobilize Capacity
	Diverse Networks
Rural Food System Resilience	Lessons Learned

Rural Community Stressor, Conditions, and Characteristics

The CKIs highlighted the significance of rurality as a community condition that influenced food security efforts. A culinary arts teacher in the career and vocational center and a rural mother in a Southern state noted food challenges in her rural community, including accessibility, availability, affordability, and distance to preferred or quality foods. She described their rural community food environment as:

[Our community has] two dollar stores that sell frozen and refrigerated food items, but our fresh produce is very poor, and the prices are very high. For our elderly population that doesn't, they don't have options [to travel] for better quality or better pricing. They're just sort of stuck with canned or processed foods.

The same culinary arts teacher also illuminated strengths of social support and sacrifices of opportunity for her family living in a rural context, noting that:

People who are living in rural communities are in these areas because their family is here. We've toyed with the idea of moving closer to work or seeking out other work opportunities, but that family support is the reason we sacrifice opportunities that might be available in more metropolitan areas.

The CKIs highlighted the importance of considering challenges and potential strengths that may be uniquely prominent for rural families when designing and implementing food security initiatives.

The availability of funding also emerged as a critical contextual factor influencing

the effectiveness and sustainability of food-security initiatives. Securing adequate financial resources to support outreach was identified as one of the top priorities. Many CKIs noted the initial influx of funding from federal and state sources, at times lamenting the challenges of navigating new funding sources. While these funding sources provide opportunities to expand and enhance food-security efforts, several CKIs also noted an increased need for collaboration, communication, and heightened responsibilities. Some CKIs discussed piecing together various funding sources to create a steady funding stream. For example, one CKI working for a nonprofit food assistance program on a remote U.S. island explained that her organization initially received funding from federal and state agencies, but these funds were cut by half. Consequently, they had to seek additional funds from donations and fundraisers to meet new or emerging needs. Additionally, CKIs mentioned using funds to support other related needs like housing, utilities, and childcare, all of which are intertwined with family food security.

Finally, the COVID-19 pandemic created

stressor conditions (e.g., social distancing and supply chain disruption) that threatened food security for many families as well as interrupted services provided to families. CKIs described how the pandemic resulted in increased needs for family-serving resources and communication, while also placing greater constraints on capacity in their “boots on the ground” organizations. In addition to funds, they noted the crucial roles of patience, community support, and collaborative interagency relationships in their organization’s ability to adapt. Flexibility was particularly highlighted in both interagency and client communication, with increased use of traditional (phone calls, email, radio) and newer (social media, video conferencing, texting) technologies.

The pandemic required social distancing, which uniquely necessitated the use of technology to connect with other organizations as well as the rural families being served. Some of these changes involved using new or less familiar technologies like video conferencing and mobile internet hotspots, while others were well-known technologies like email and web pages. An Extension County agent in family consumer sciences shared, “Corporate Extension has developed a bi-weekly calendar. There is lots of classes, especially during COVID that went online including classes on canning, cooking, and nutrition that people could watch through Facebook Live.” While some CKIs looked forward to the return of “normal” in-person interactions, most spoke highly of technology’s ability to increase reach to new service populations and partners.

Formal and Informal Community Network Structures

The social organization theory of action and change claims that network structures, including formal, informal, and partner interactions, play a critical role in community resilience, as social change does not occur without them. Some CKIs discussed different roles within that structure that supported the food system response. Certain individuals and organizations were seen as network hubs, facilitating connections and resources.

The presence of a central hub or coordinating entity in the community to connect resources

across systems was crucial for effective collaboration and capacity-building. Interestingly, none of the CKIs from food-service organizations specifically identified their role as a hub, but most hub organizations (health care, public service, education) identified food security resources and partners as a part of their professional network. They highlighted the importance of a centralized hub that facilitated communication, coordination, and information-sharing among network members, streamlining the delivery of resources to those in need. A CKI from a food-related organization in an RUCA Code 10 county in a Southern state who considered his organization to be an information hub proudly reported that:

We communicate with each other [across organizations], if somebody getting into the Rehabilitation Center and they see that [the participant] may be eligible for the SNAP benefits, well then, they will refer them to us. ... [Our organization] has a lot of resources we referred [families] to as well as partnerships with different agencies. If we are not able to help [families] with our SNAP assistance, if they are over the required [income] limit, we are able to give them other resources to try to help them.

Network connections were largely described as partnerships in response to an aligned organizational mission and community need. CKIs discussed how they relied on both formal and informal relationships that existed before the pandemic for adaptive or innovative action toward community needs during the pandemic. Across all organizational partnerships, especially those that were identified as hubs, formal and informal relationships across sectors of rural community organizations were initiated to support food security for families. A director of an Extension office in a Midwestern state said, “we utilized the county sheriff’s capacity for food delivery. Well, we’ve always been in communication, [but] we’ve not ever worked together on a project before, and so they became our monthly delivery people for our senior meal boxes.” New partnerships such as this example could be quickly implemented due to individu-

als' connections within the community. Another Extension agent in a Western state described the challenge of quick implementation when a key individual's departure slowed the organization's ability to adapt and innovate:

When there's a change in our team, it is very significant. This person had just an extensive amount of knowledge in terms of food systems and food security, incredible contacts and relationships with the community food bank of [state] and really deep contacts with local food banks and food pantries. I think we eventually were able to get traction and had enough time together that we were able to pick up and keep working.

Many CKIs identified leveraging new and existing interpersonal relationships between agencies during the COVID-19 pandemic as crucial to their success in meeting community needs. An Extension county agent in another Western state succinctly described an enhanced relationship during the pandemic as, "we have formed new, more often probably strengthened, existing relationships, or maybe we were acquaintances, and have actually formed either formal or a lot more nonformal partnerships and relationships." Another CKI, a middle-school science teacher in a Midwestern state, similarly reported:

Since the beginning of 2020, I think they've become closely knit. The school is no more a separate entity, it's just a part of the community. Basically, it's like a huge family, it's like everyone plays a different role. And like a family will become dysfunctional if someone doesn't play a role that's how it would be, and so I'm really grateful to the community partners for the help and resources that are sometimes just being there.

Formal and informal networks formed from both usual and unusual partnerships are supported by shared values and common community well-being goals. These interagency partnerships included not only food-related organizations like food banks and food delivery services, but also

nonfood partners such as business, community health, religious, first responders, and aging services. While many welcomed increased awareness of partnership possibilities, one CKI raised a concern that a return to "normal" had weakened those relationships that had been strengthened through COVID-19. CKIs often discuss these partnerships with outside organizations, as well as existing relationships and awareness of individual staff members, as critical to strengthening partnerships in disaster response and adaptive change.

Social Capital: Information, Reciprocity, and Trust

Social capital is defined as "the aggregate of resources that arise from reciprocal social relationships in formal and informal networks" (Mancini & Bowen, 2009, p. 255). Both formal and informal network partnerships involve exchanging information, promoting reciprocity between organizations, and fostering trust.

Partnerships supported information exchange, which was vital in facilitating efficient resource allocation, ensuring accessible food support, and building community capacity. Building on their interagency relationships described in the previous section, CKIs noted that providing information to community members often included identifying needs and making referrals. Food organizations were also particularly focused on directly sharing or connecting clients with educational information ranging from growing food to nutrition education for health promotion. However, some CKIs indicated that this exchange of information about resources was challenging, particularly regarding knowing the best ways to share information with clients in accessible formats. Many reported that sharing information since 2020 has required them to adapt to the use of both traditional and new technologies to reach clients. A CKI from one organization noted a preference for the former face-to-face interactions, perceiving this to strengthen the organization-client relationship and the client's mental health. In addition to communication changes, CKIs stated that they also had to adapt to the changing frequency of service during the pandemic. While they were committed to service, their work shifted to meet growing food

insecurity, to expand the scope of service, and to enhance organizational capacity.

Bidirectional partnership between organizations was a point of pride expressed by many CKIs. The ability to provide reciprocity of support was directly related to community conditions (rurality, funding, COVID-19 pandemic impacts) and network structures (stability of existing partners and connections to food or food-adjacent partners). Reciprocity was also supported by identifying mission overlaps in supporting family and community health. Together, organizations extended support, connected pieces, and shared resources to improve food security in their communities. One CKI, a director of a nonprofit food service agency in a Midwest state, described the agency's action, which benefited everyone involved. She shared:

[Her food service agency] went out and purchased gift cards from all of our area restaurants and distributed those to our frontline workers to thank them for all the additional work they were doing. This was very helpful to our Chamber of Commerce that those dollars could be back into the businesses that weren't seeing the foot traffic. We distributed the gift cards to residents that needed food as well, so they could do "takeout" [from] some of those restaurants that were still open.

Successful exchanges of information and mutually beneficial partnerships produce a sense of trust, which is a critical element for building and maintaining social capital across organizations and with community members (Mancini & Bowen, 2009). While CKIs rarely mentioned trust specifically, their comments strongly suggested that positive communication, shared responsibility to clients, and experience of successful collaboration contributed to the development of trust. A comment made by a teacher in a public school in a Western state illustrates how successful experiences increase trust in their community and encourage them to reach out to more people. She stated:

The local food pantry has been amazing. They have been giving me snacks. There are also

regional organizations which are provided funds to buy supplies for the school. I think as teachers, we need to just reach out and ask for help, there are many people out there, wanting to help, they just don't know who needs them.

It is worth noting, however, that fostering trust may not be straightforward without careful considering the cultural and historical backgrounds of organizations or clients. For example, one food-related CKI from a Western state in a RUCA Code 10 county, where 22% of the population with limited access to healthy foods, observed potential distrust of government agencies among Native American families in their community. Alternatively, in rural communities where there is a shortage of specialists, individuals often wear many different professional hats, and organizations are constrained by limited capacity to meet diverse needs. For example, the effective delivery of food and nutrition education may vary between U.S.-born individuals and immigrants, requiring time, effort, and resource capacity to develop culturally appropriate curricula. While there may not have an easy solution, CKIs stressed the importance of trust and understanding to ensure food security across all families in their community.

Community Capacity: Shared Responsibility and Collective Competence

In response to the unprecedented pandemic, CKIs exhibited a strong sense of shared responsibility and collective competence in addressing community food systems challenges—both essential elements of community capacity. CKIs reported acting on the belief that they were stronger together than in isolation, and partners were best served by defining roles to build capacity toward a shared goal.

CKIs highlighted how they saw a sense of shared responsibility for the welfare of their communities through relationships with partner organizations and community clients. They often pursued shared goals of increasing client families' self-sufficiency through education and community service support. This collective concern underscored a commitment to address food insecurity as a collaborative effort among various organizations and

individuals, emphasizing a shared organizational mission, target audience, or broader community issues they were trying to address.

CKIs spoke to the collective ability between themselves and their organizational partners to mobilize capacity to respond to emerging needs and challenges. They emphasized the importance of proactive actions, such as seizing opportunities and confronting threats, to enhance community well-being. While collaborative partnerships can increase impact, they may also increase capacity burden on CKIs' time, communication, and work responsibilities if roles are not clearly defined. CKIs often noted the defined partnership roles and how each organization was uniquely contributing to help support families and broader food systems security. They described playing to their organizational strengths, especially in a time of crisis, to not stretch beyond capacity and not step into spaces where they may not have expertise or may duplicate a service. An Extension director in one Midwestern state provided an illustrative example of how each organization contributed within its defined role without overextending its capacity or duplicating a service. She commented,

When a crisis happens, [organizations] played to their strengths. They didn't try to provide all the meals and all the clothing and all the money; they understood that [what] they were best at doing. The churches were pretty strong, but the people who gave them food, like stores and restaurants, would help support the churches because that was their strength, instead of trying to undermine what the churches were doing.

Another example is an organization serving food to its community in another Midwest state. It partnered with local businesses to collectively promote home gardens, as described below:

We got some seed packets [as box store excess], and seniors were able to go out and plant some gardens. [Our organization] also worked with our area lumber companies that were giving discounts on supplies for kids and our land-grant institution put together infor-

mation on how to make a small garden container. We distributed those [garden packets] through all of our schools. We also put mailboxes throughout all the community, so people could grab out a package of 14 different kinds of seeds [for their home] gardens.

Further highlighting the complex nature of collaborative partnership, CKIs noted connections to conditions, context, and diverse networks as influential. They reiterated that funding, communication, and technology were essential for building collaborative capacity during this time of community stress. Additionally, CKIs noted that enhancing collective capacity often involved expanding access to nonfood-related resources, such as public assistance programs or housing, in addition to focusing on food security for their clientele. CKIs discussed both adaptive and collaborative solutions in addressing the food and well-being needs in their rural communities.

Rural Food System Resilience

According to the social organization theory of action and change, community resilience is attributed to organizations making multiple successful adaptations and innovations across the elements (Mancini & Bowen, 2009). Our study documented the protective processes that buffer food insecurity and facilitate community functioning in the context of the COVID-19 pandemic. Lessons learned in resilience were often attributed to an organization's drive to support public health or commitment to serving its clientele. CKIs also saw their organizations as boots on the ground, compelled to make changes to meet local needs. They emphasized the importance of relationships with organizational partners, local businesses, and families, viewing the pandemic as an opportunity to expand their reach and impact. Valuable food-system-related experiences shared by CKIs indicate that they expanded their community competence by recognizing their shared mission, strengthening their formal and informal networks, and fostering community trust. The following comment from one CKI in a Western state serves as a testament to how rural communities turned a crisis into an opportunity to develop resilience:

Because we've had funding, because we have these people who are dedicated towards different avenues, we have people that are dedicated towards food access in the schools. These healthy community committees train new leadership, so that we have new leadership coming up. Because of this, I think we were more prepared for crisis now that we had this pandemic in our community. ... Before we had this collective impact initiative, we didn't have any of this, I mean this has been very powerful.

Discussion

Community stressors will continue to affect rural families, but not enough is known about how family-serving community organizations might sustainably navigate them. Therefore, this qualitative key informant study aimed to explore if and how community organizations resiliently navigated a time of stress across components of the social organization theory of action and change framework. Through this exploration, we gained a deeper understanding of the mechanisms in the framework that organizations used to support resilient food systems to meet the needs of rural families during the COVID-19 pandemic. CKIs shared factors that shaped their approach to rural food-systems action in alignment with these framework areas: (1) Rural community stressors, conditions and characteristics, (2) Formal and informal community network structures, (3) Social capital, (4) Community capacity, and (5) Rural food system resilience. All areas remained important to resilience in a time of community stress, but the organizations interviewed also expressed strategies they utilized for support that were not in their previous scope of work. Understanding approaches used during this community stressor can provide direction for resilient sustainable capacity planning within rural, family-serving organizations, even in times of unexpected community stress.

The context of community conditions and characteristics of the COVID-19 pandemic stressor influenced the actions taken, indicating the potential importance of flexible resources and support within rural food systems to adapt to their unique needs. The contextual challenges discussed by CKIs were not specific to the food-supply chain;

instead, they supported the assumptions of Hammond and Dubé (2012) that food systems are affected by broader-scale biophysical and sociopolitical factors, including rurality, funding, social distancing, and technology. While COVID-19 pandemic-specific stressor features were extensively discussed by the nature of the interview questions and timing, the rural context played an important role in how well rural families and organizations serving them acted adaptively in the face of food security challenges. Research in rural Canadian communities found that while most families had internet access, there were challenges with quality, reliability, and affordability (Dow-Fleisner et al., 2022). Also, studies exploring outcomes from telehealth in rural communities found its use to decrease resource costs for participants and organizations (von Braun et al., 2021). CKIs noted these complexities with technology, often describing successful experiences with familiar or new technologies. CKIs even noted that shifting or increasing the use of technology allowed them to expand their reach and awareness of resources, while a few still lamented the limited in-person connections that were missing. CKIs also highlighted the challenges posed by changing funding streams and the increased time and effort required to navigate them smoothly. Research has not yet identified the extent to which rural food systems are affected by different types of community stressors. Therefore, policy at all levels should consider how to foster consistent and flexible resources for rural organizations working in food systems to meet specific and unique local needs in a time of stress.

Even though the COVID-19 pandemic required relationships to be more physically distant, CKIs stressed that interpersonal and interorganizational relationships remained necessary for adaptive change. Previous reviews of the literature noted mixed findings on the role of social cohesion in supporting food security; these findings would suggest that the importance of these relationships may increase with a community stressor (Carter et al., 2014). Of note, the interactions that CKIs identified as important to their function in the food system were not always with central partners in the food supply chain, again indicating support for broader scale factors of influence (Butzner &

Cuffee, 2021). In further support of our findings, Mancini and Bowen (2009) theorized the importance of formal systems maintaining informal connections and relationships as critical to resilient actions. In exploring a Food Systems Resilience toolkit, organizations identified similar contributing factors in human, social, and cultural capital as contributory elements (Conner et al., 2023). Additionally, the field of human resource management regularly recognizes the role of interorganizational networking, noting the challenges of networking as a perceived burden or lower productivity activity (Jolink & Dankbaar, 2010). By interacting with usual and unusual partners, organizations made rapid, innovative, flexible, and adaptive changes to meet the COVID-19 pandemic-related food-security challenges facing families in their community. Human capital is often built on social networks; thus, Hollenbeck and Jamieson (2015) argue that organizations should strive to better understand the social and knowledge networks driving successful partnerships, especially for use in measuring performance and supporting employee well-being. Moderate time pressure for employees to build trusted relationships may be especially important in rural-serving organizations to help activate informal networks and strengthen relationships. These are critical for effectively responding to high-pressure situations like a community stressor (Jolink & Dankbaar, 2010).

Positive proximal relationships were important to organizational collaboration, but more distant experiences also informed trust. Trust within networks was often unspoken but important in growing and developing collaborations across diverse sectors and cultural communities. Context must also be considered when fostering trust in community systems. Many minority cultures within rural communities face historical trauma, including cultural suppression, forced relocation, and broken treaties (Brave Heart & Chase, 2016), as well as continuing economic, environmental, and health disparities (National Academies of Sciences, Engineering, and Medicine, 2017). Organizations can promote both network building and community understanding using tools such as recruiting and training new employees, staff recognition, and giving supervisory support (Jolink & Dankbaar, 2010).

To promote resilient and sustainable relationships, organizations should invest in professional development and hiring practices to deepen their understanding of diverse life experiences. They should also encourage an open exchange of knowledge with partners to build trust and enhance capacity for resilience.

In support of social distancing, CKIs confirmed that much information exchange with clients and partner organizations quickly adapted from face-to-face to virtual when possible. At times, CKIs suggested this reduced access to some clientele, while more often than desired, ultimately expanded their reach. Similarly, preliminary evaluation has pointed to technological shifts in community education expanding potential reach to new populations (Ufnar et al., 2021). Reciprocity included organizations sharing information and referrals, resource exchange, and working together toward a shared goal. These interactions appear to build on and strengthen trust across the food system and in the rural community. Trust between partners has long been considered a crucial factor for partnership success, yet it takes time to develop (Casey, 2008). With high needs from the families they serve, CKIs indicated that their actions pivoted both delivery methods and partnership structures, relying largely on growing or maintaining pre-existing, trusted relationships to meet their organizational goals and community needs. This further supports the need for institutionalized networking and supports flexible outreach and services within rural communities.

Participants described diverse organizational sector networks coalescing around an aligned mission of community food support. This supports the Mancini and Bowen position that diverse groups connecting around a shared community goal led to increased odds of positive outcomes (Mancini & Bowen, 2009). Further, partnerships that worked toward a collectively valued broader impact for a shared target population and distinct, yet connected, roles could work together toward a healthier community. Similarly, interorganizational research in Spain identified that shared values and complementary resources predicted partnership success (Casey, 2008). Perhaps uniquely important in rural communities, CKIs emphasized the need

to define roles to support the use of complementary resources and connect beyond the food supply chain partners to address community food security during the COVID-19 pandemic stressor. Future research should more deeply explore adaptive strategies for both community capacity and social capital components of the social action processes. In a rural community context, where time and effort are arguably at a premium due to distance, access, and population density, ensuring an intermediate expectation for networking and clear connections to partner missions could further support capacity (Jolink & Dankbaar, 2010; Sharkey, 2009).

Van Wassenauer and colleagues (2021) argued that there is a “trilemma” of food system resilience that could impede interdisciplinary collaboration, system integrity, transformability, and individual agency. For CKIs in our study, their resilience was supported by clear functional roles. Organizations collaborated toward largely new, transformative actions as opposed to focusing on bouncing back to former interactions as usual. Regarding agency, the collective will of the food security partners within the community food system expanded beyond traditional food supply chain boundaries to bring together diverse rural partnerships towards resilient action.

Strengths and Limitations


While the sample is moderate in size, a strength of this study is the depth and richness of the data collected from a variety of rural, family-serving professionals across the United States. A limitation of the study is the use of retrospective data versus data collected at the onset of the pandemic and throughout the pandemic, which may have yielded different insights from community partners. Even though every community food system is unique, there are similarities across food systems, which

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allow for communities to learn from others’ experiences and identify approaches that work best for their community.

Conclusion

Findings from this study further support the critical role interagency community networks play in strengthening family food access and rural food system resilience in times of stress. Rural communities across the U.S. similarly have smaller, more dispersed populations and are often near the end of food supply chains compared to urban centers. Rural and urban communities commonly have disparate experiences of localized threats to food systems, organizational capacity, and access to resources. Partnerships across sectors in rural communities strengthen capacity and reduce redundancy to help ensure families’ food needs are met during times of natural disasters or public health emergencies such as the COVID-19 pandemic. Further research is needed to examine the scope and variations within resilient food systems’ actions to understand how communities might maximize their capacity and resilient actions. To promote resilient rural food systems, organizations should identify strategies to foster traditional and unique relationships that could support future food systems capacity-building to meet family food needs in a time of community stress. 

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Appendix A

Key Question to community key informants (CKIs): What lessons have you learned over the past year about your ability to effectively serve families in your community? (broad question with these follow ups)

- What community resources (person, structures, organizations) have you used to support families since the beginning of 2020 in terms of referrals?
 - What do you think is the main organization you have referred families to?
 - What types of resources did this organization provide provided for referred families?
 - How well did the organizations respond to the needs of the referred families?
 - What community resources do you wish you had that you don't or did not?
 - What other ways have families connected to services, besides referrals by you? (referrals, cold calls, 311, etc.)
- How have partnerships between you and the community resources changed since the beginning of 2020?
 - In what ways have you connected with other agencies or organizations to serve your community?
 - Have you and your organization established any new partnerships since the beginning of 2020?
 - Have you accessed funding such as the CARES Act?
- What has changed about how you meet families' needs since the beginning of 2020?
 - What role has technology played in how you meet families' needs?
 - Have you changed how you communicate with families?
 - How has the scope of services you provide changed?