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Community food systems resilience: Values, benefits, and indicators

Catherine G. Campbell,[a] * Alicia Papanek,[b] Alia DeLong,[c] John Diaz,[d] and Cody Gusto [e]
University of Florida

Debra Tropp [f]
Debra Tropp Consulting

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Abstract

There is increasing awareness that community food policies and programs can address issues of equity, sustainability, profitability, and resilience in food systems. Community coalitions, local governments, food policy councils, cooperative extension, and other stakeholders seek to improve community food systems through policy and programmatic development. However, these groups often do not know what types of policy or program models exist to help achieve their goals. This research identified expert consensus on three important topics related

[a] * *Corresponding author:* Catherine G. Campbell, PhD, MPH, CPH, Assistant Professor and Extension Specialist, Community Food Systems, Department of Family, Youth and Community Sciences, Institute of Food and Agricultural Sciences, University of Florida; cgcampbell@ufl.edu

[b] Alicia Papanek, MS, Graduate Assistant, Department of Family, Youth and Community Sciences, Institute of Food and Agricultural Sciences, University of Florida; aliciapapanek@ufl.edu

[c] Alia DeLong, PhD, Research Coordinator, Mid-Florida Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida; delonga@ufl.edu

[d] John Diaz, Assistant Professor and Extension Specialist, Department of Agricultural Education and Communication, Institute of Food and Agricultural Sciences, University of Florida; john.diaz@ufl.edu

[e] Cody Gusto, PhD, Postdoctoral Associate, Department of Agricultural Education and Communication, Institute of Food and Agricultural Sciences, University of Florida; cgusto@ufl.edu

[f] Debra Tropp, Principal, Debra Tropp Consulting; Kensington, MD USA; Debra.Tropp@gmail.com

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to community food systems resilience: (1) values that should guide adopting and implementing policies and programs to facilitate community food systems resilience, (2) benefits of adopting policies and programs that support community food systems resilience, and (3) policies, programs, and initiatives that are indicators of resilience. These indicators can be used to assess the resilience of communities and to help communities identify policy options to achieve specific goals and objectives. The results of this study were used to create a community food system resilience audit tool that community groups can use to assess the current resiliency of their food system, identify priorities, and set goals. The audit tool focuses on seven core themes that contribute to community food systems resilience: agricultural and ecological sustainability, community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics. The individual indicators in this audit tool provide specific policies and practices that can be adopted by local governments, supported by cooperative extension agents, and advocated for by food policy councils and community-based organizations.

Keywords
Local Food Policy, Resilience, Equity, Indicators, Sustainability, Community Health, Food Justice, Values, Regional Economics, Local Government

Introduction

There is increasing awareness that effective community food policies and programs can address issues of equity, sustainability, profitability, and resilience in food systems (Béné, 2020; Calancie et al., 2018). Community coalitions, local governments, food policy councils, cooperative extension, and other stakeholders seek to improve community food systems through policy and programmatic development. However, often these groups do not know what types of policy or program models exist that could help achieve their goals—from the broad goal of increasing the overall resilience of their community food system to targeted goals, such as increasing food access or reducing food insecurity in their community. While policies alone do not create resilient community food systems, policies can create a supportive environment in which producers, consumers, and community groups can work alongside local governments to develop initiatives and pursue mutual goals.

The purpose of this study was to identify expert consensus on three important topics related to community food systems resilience. First, we identified the most important values that should guide adopting and implementing policies and programs that facilitate community food systems resilience. Second, we identified the benefits of adopting policies and programs to support community food systems resilience. Third, we identified policies, programs, and initiatives that are salient indicators of resilience, capable of both assessing the resilience of communities and helping communities to develop specific goals and objectives.

The results of this study were used to create a community food system resilience audit tool that community groups can use to assess the current resiliency of their food system, identify priorities, and set goals. The policies and programs that are indicators in this audit tool provide specific policies and practices that can be adopted by local governments, supported by cooperative extension agents, or advocated for by food policy councils or community-based organizations. While communities differ in the extent to which they use formalized policies to achieve goals, we sought to identify resilience-strengthening policies broadly applicable to communities, because food systems resilience should not be available only to those communities with the resources or support required to implement policies. This audit tool is intended to be applicable to any community—rural or urban, well- or under-resourced.

We begin with an overview of the concept of resilience and the key characteristics of resilient systems, focusing on how the concept and characteristics apply to food systems resilience. The overview of how the concept of resilience applies to food systems is organized based on the key themes in the community food system audit tool that was created from the results of this study. We then briefly discuss previous examples of food system resilience indicators and frameworks to frame the purpose of this study. Finally, we discuss the

results of the community food system resilience Delphi study, which provides a list of the key values, benefits, and indictors of community food systems resilience based on expert consensus.

Review of Literature

Applying the concept of resilience to communities is relatively new, as the concept's historical roots are in biological systems. Following COVID-19, there is increased discussion about community food systems resilience (Béné, 2020; Dou et al., 2021). Below, we discuss the historical roots of the concept of resilience and trace its path to its application to community food systems. Since this literature is extensive and wide-ranging, the literature review is organized to provide readers with a foundational understanding of the evolution of the concept of resilience, which we believe is necessary to understand the community food system resilience audit tool.

In the wake of increasing environmental, economic, and social challenges, food system resilience is important because of its adaptive capacity to address acute and chronic disturbances (Tendall et al., 2015). Strategies to strengthen and improve the food system frequently take a sustainability approach by seeking to ensure that food production, distribution, and consumption meet community nutritional needs without depleting or harming future resources (Willett et al., 2019; Worstell & Green, 2017). However, as sustainability measurements have been developed, resiliency takes a complementary approach: "sustainability is the measure of system performance, whereas resilience can be seen as a means to achieve it" (Tendall et al., 2015, p. 18). Thus, sustainability and resiliency are integral to meeting goals associated with individual health outcomes, community development, and environmental sustainability (Worstell & Green, 2017).

Background

The concept of resilience is predicated on the understanding that "uncertainty and surprise is part of the game and you need to be prepared for it and learn to live with it" (Folke, 2006, p. 255). Resilience concepts have been operationalized to explain consequences of disruptive processes in individuals or populations since the 1970s, drawing from the ecological and biological sciences to describe how low- and high-stability populations in biological systems (e.g., insects, mammals) adapt, transform, or maintain equilibrium in the face of environmental disturbances (Holling, 1973). Since its emergence and widespread application in the sciences, resilience has been characterized across a variety of disciplines as an attribute of systems that describes capacity to perform under adversity. Definitions and indicators have been adapted to apply to psychological, developmental, social, community-based, and economic domains (Lesnick et al., 2013).

Examples of resilience indicators include: buffer capacity (Ifejika Speranza et al., 2014), resource allocation and availability (Worstell & Green, 2017), adaptation and transformation (Folke et al., 2010), diversity (Bousquet et al., 2016; Cabell & Oelofse, 2012), and capacity for learning (Bousquet et al., 2016; Cabell & Oelofse, 2012; Ifejika Speranza et al., 2014). How these indicators are manifested in specific communities is based on the unique needs, culture, or geography of the people, animals, families, or institutions that inhabit those systems (Lesnick et al., 2013).

It is important to note that food systems resilience is not one-size-fits-all. The specific resilience goals for any food system depend on community consensus and expert opinion, and the extent to which a system or community can meet goals depends on its willingness to self-evaluate and employ relevant measures (Ifejika Speranza et al., 2014; Tendall et al., 2015). Resilience itself is not a "finite or objective outcome, but rather a continually contested process of responding, adaptation, and livelihood making" (Walsh-Dilley et al., 2016, p. 6). In this sense, resilience itself is an emergent property of a system whose "capacities are linked and act together" (Faulkner et al., 2018, p. 1).

Social Ecological Systems Resilience

Social-ecological systems (SES) perspectives on resilience focus on the interdependency of humans and the environment (Folke et al., 2010). The functioning of a social system impacts the ecological-environmental outcomes of water sources, soil health, and climate, while engaging in a reciprocally

deterministic relationship with the physical and mental health outcomes of people in the system (Cabell & Oelofse, 2012; Worstell & Green, 2017). From this perspective, ecological or social resilience on their own without integrated support exacerbate the other's weakness. SES resilience focuses on strengthening social and environmental systems together, buffering against both social and environmental disturbances, and utilizing disturbances as windows of opportunity to meet community needs (Folke, 2006).

Food systems are SES by nature—they require integrated management of land, soil, and human capital to produce essential goods. Their ecological success is enhanced by social constructs: "self-organization capacity, governance capacity, transformability, transparency, learning capacity…as well as the existence of an appropriate institutional framework with equitable rights, entitlements and decision-making processes" (Tendall et al., 2015, p. 20). As SES resilience perspectives have evolved within food systems research and practice, a number of approaches have been advanced to build SES-informed frameworks and indicator models for use by practitioners, researchers, and local governments (Worstell & Green, 2017). These approaches include: community and livelihood (Faulkner et al., 2018; Ifejika Speranza et al., 2014), agroecosystems and agriculture (Cabell & Oelofse, 2012; Ludden et al., 2018), food security (Tendall et al., 2015), and sovereignty (Walsh-Dilley et al., 2016).

To improve or strengthen SES food systems resilience, indicators must be identified, validated, and measured (Tendall et al., 2015). In Baltimore, for example, the city integrated the food system into an all-hazard mitigation plan with the ultimate goal of improving chronic and acute food insecurity by addressing "preparedness, response, recovery, and adaptability of stakeholders across the system, from farms to processors and distributors, food pantries and stores, and communities" (Biehl et al., 2018, p. 41).

General resilience and specified resilience

General resilience refers to how the elements of a system cooperatively cope with all types of disruptions, while specified resilience refers to the particular values that compose the system's overarching goal, posing the question: "resilience *of* what, *to* what"—e.g., resilience *of* aquaculture *to* algae blooms, or resilience *of* fruit and vegetable access *to* global pandemics (Folke et al., 2010, p. 4; Walsh-Dilley et al., 2016, p. 5). Examples of specified resilience indicators include systems of leadership or the ability to self-organize, the extent to which community members experience place attachment, bonds between community networks and community cohesion, knowledge of the system or recent memories of overcoming previous disasters, and the capacity to learn new things (Faulkner et al., 2018). Specified resilience indicators together help achieve the general goal of the system, addressing broad social and ecological indicators, including environmental sustainability, community self-reliance, leadership and decision-making, focus on food producers, and place-based economics (Cabell & Oelofse, 2012; Ludden et al., 2018; Worstell & Green, 2017). The absence of any of these indicators in reaching resilience goals may not only weaken resilience, but indicate system failure (Cabell & Oelofse, 2012; Walsh-Dilley et al., 2016).

General and specified resilience goals are particularly important to identify at the outset of policy formation because general goals, pursued without specified goals, can undermine resilience (Tendall et al., 2015). Food security, defined as when food is sufficient, appropriate, and accessible to all members of the community (Bousquet et al., 2016; Tendall et al., 2015), and food sovereignty, defined as a person's "right to define their own food and agricultural systems in culturally and ecologically appropriate ways" (Walsh-Dilley et al., 2016, p. 1) have been considered general goals of resilient food systems by those working in local governments (Biehl et al., 2018). However, in some cases, a resilient system can exacerbate inequality or poor community health through rigidity or poverty traps (Bousquet et al., 2016; Folke et al., 2010; for example, in underserved neighborhoods when there is a consistent supply of food, but the foods are calorie-dense, nutrient-poor, and only available at convenience stores. The availability, access, stability, and proper utilization of resources should follow the central principles of both resilience and food security, reflecting the natural conceptual par-

allels between them (Bousquet et al., 2016; Walsh-Dilley et al., 2016).

Adaptability and transformability

Adaptability and transformability are innate characteristics of resilience (Lesnick et al., 2013). When faced with adversity, resilient systems meet their general and specified goals as a result of effective adaptation and/or transformation. Adaptability is the extent to which individuals or the community can influence and make adjustments when faced with shocks or disturbances (Folke et al., 2010; Lesnick et al., 2013). Transformability, on the other hand, is a system's ability to perform robust systemic change, either by choice or because a disturbance is great enough to require it (Folke et al., 2010). Systems that are sufficiently prepared can utilize crises as windows of opportunity and transform themselves to be resilient in new ways (Bousquet et al., 2016). While the question of when to adapt versus when to transform continues to be investigated (Bousquet et al., 2016), some contend it depends on the system's self-reflective capacity and organizational leadership (Worstell & Green, 2017). There is also the question of *what* to change: will the system require shifts in social perspectives and attitude, or tangible inputs such as a seed or a tool, or both? Is the community willing and prepared to do what needs to be done?

Diversity

Diversity in a well-managed system can ensure contingencies and promote innovation (Cabell & Oelofse, 2012). Resilient communities have a diversity of complementary enterprises to strengthen the bonds and bridges within networks that allow them to work harmoniously and support the growth of one another, rather than compete (Duncan et al., 2018; Walsh-Dilley et al., 2016; Worstell & Green, 2017). Resilient communities are diverse in landscape and seascape, institutions, actor groups and networks, governance support, forms of collective action, and learning platforms (Folke et al., 2010). Racial, ethnic, and gender representation, explicitly inclusive of female and/or non-white principal farm operators, are also critical indicators of diverse approaches to strengthening resilience (Ludden et al., 2018).

Diversity thresholds vary among individual food operations. Too much diversity, such as growing an unmanageable number of crops, or relying on too many different market channels to remain economically viable (Sanderson Bellamy et al., 2021), can drain resources and human capital, and thus reduce resiliency (Cochrane & Cafer, 2018). Although farm livelihood and survival is dependent on a diversity of income streams to enhance overall revenue (Bousquet et al., 2016), the ability to diversify depends on the farmer's resources, assets, and ability to make investments towards diversification (Cochrane & Cafer, 2018).

Agricultural and ecological sustainability

Effective management of agricultural and ecological sustainability is a central theme of resilient food systems, prominent in food systems resilience literature (Cabell & Oelofse, 2012; Duncan et al., 2018; Ludden et al., 2018; Worstell & Green, 2017). Progressive agriculture, a concept developed from both resilience and sustainability, is a "multidimensional, evolving agricultural system that benefits the social, economic, and environmental conditions of communities" (Ludden et al., 2018, p. 167), which aptly centers agriculture within the SES perspective and operationally demonstrates the importance of its influence.

Actors within a resilient food system, driven by environmental conscientiousness (Duncan et al., 2018), work "with nature to minimize imported manufactured inputs, moving toward ecological integration" (Worstell & Green, 2017, p. 37). Improved soil health, water retention, and ecological biodiversity allow farms to produce foods sustainably with minimal inputs and reduce adverse environmental impacts (Worstell & Green, 2017). Using organic growing practices (Ludden et al., 2018), promoting conservation innovations, supporting and building soil and water resources, and facilitating ecological self-regulation using cover crops, perennial plants, and polycultures make up the sustainable agricultural and ecological contributions to resilient food systems (Cabell & Oelofse, 2012).

Community health

Community health has generally not been consid-

ered an indicator of food systems resilience. Rather, policies or programs often are implemented because of a deficit in community health, such as lack of access to nutritious foods or prevalence of nutrition-related chronic disease. For this reason, strengthening food systems resilience can be a means to address that deficit (Biehl et al., 2018). It has been suggested that community health indicators are results or outcomes of food systems resilience, rather than a measure of resilience (Worstell & Green, 2017). Community health and resilience exist in a cyclical relationship, in which individual health and well-being begets a more active contribution to and perpetuation of resilience within the community. A resilient food system provides accessible and affordable nutritious foods that provide community members with the "physical, mental, and emotional benefits of being nourished properly, longevity, and optimal health, and hence not only survive but thrive" (Alesso-Bendisch, 2020, p. 29).

Community self-reliance

Defined as the adaptability, dependability, and capacity of the community to effectively respond to disruptions, community self-reliance is dependent on strong community networks and social cohesion (Faulkner et al., 2018). The ability to establish community self-reliance can occur from the top-down and the bottom-up, and/or autonomously among actors, with system restructuring happening explicitly among those directly affected to protect the community during times of acute or chronic crises (Worstell & Green, 2017). Community food systems can be locally organized and/or locally owned, but more importantly, a long-term and self-reflective ability to "periodically transform" strengthens community self-reliance in its contribution to social dimensions of resilience (Worstell & Green, 2017, p. 37). In food systems, an example of community self-reliance is the interdependent relationship between food consumers and producers, as farmers produce food with the understanding that community members are seeking nutritious, locally grown food, and consumers are concerned with supporting those farms as a way to contribute to the local economy (Duncan et al., 2018).

Finally, self-reliance is determined by the community's ability to prepare for contingencies and establish access to resources. Developing and accumulating reserves, physical infrastructure, sufficient redundancies, and "diversity of complementary enterprises" (Worstell & Green, 2017, p. 37) further enhance community self-reliance.

Distributive and democratic leadership

A resilient food system is "independent yet tightly connected to other communities, markets, and government policy systems" (Worstell & Green, 2017, p. 37). Therefore, resilient systems of leadership tend to be distributive and democratic, utilizing local and/or decentralized governance (Walsh-Dilley et al., 2016). While resiliency is enhanced by an "institutional framework with equitable rights, entitlements, and decision-making processes" (Tendall et al., 2015, p. 20), formal leadership has been thought to be less important in establishing community resiliency (Faulkner et al., 2018), in which regular turnover and mandatory retirement of leadership positions promote innovation (Worstell & Green, 2017). In fact, the concept of leadership can be a precarious aspect of resiliency due to its potential to cause distrust, or "legitimately block or undermine certain trajectories of change" (Bousquet et al., 2016, p. 9). Thus, leadership should emerge from the community rather than outside sources (Faulkner et al., 2018). Assessing the power dynamics of SES is rooted in the community's ability to question "representation, authority, and accountability" (Walsh-Dilley et al., 2016, p. 6), regularly innovating while simultaneously conserving "the tried-and-true qualities that built it" (Worstell & Green, 2017, p. 37).

Focus on the farmer and food maker

A resilient food system has the capacity to buffer against individual or family-based crises experienced by food producers. Investments in human capital through contribution to education and skill-building, as well as through social supports for farmers and farm families, are a commitment to sustaining a resilient food system and strengthening the adaptive capacity of the stakeholders within the system (Cabell & Oelofse, 2012). These invest-

ments include efforts—such as deploying a skilled network of community members to step in to manage farm operations if necessary (Worstell & Green, 2017)—to support farmers when they experience their own personal crises and disturbances. Sufficient human or social capital is an integral part of what makes a food system resilient, and supports farmers in their primary role of producing food (Tendall et al., 2015).

Food justice

Establishing food justice as part of a resilient food system encourages challenging the status quo to compel a focus on equity, to foster active contributions from historically marginalized populations, and to align with other forms of social activism (Gottlieb & Joshi, 2010). Actions to support food justice include enforcement of livable farm worker wages and centering of female and non-white farmers, as indicators of progressivism (Ludden et al., 2018). The COVID-19 pandemic highlighted existing inequities among food producers and food system workers by impacting market channels, job security, and safety in the workplace. The pandemic also enhanced the need for mutual aid to meet the nutritional needs of consumers in response to exacerbated economic disparities among food and agricultural stakeholders, illuminating where injustice weakened SES resilience (Sanderson Bellamy et al., 2021).

Power is central to assessing how food justice and food sovereignty—the ways in which "people have the right to define their own food and agricultural systems in culturally and ecologically appropriate ways" (Walsh-Dilley et al., 2016, p. 3)—contribute to resilience in SES and require questioning "representation, authority, and accountability" in social ecological governance (Walsh-Dilley et al., 2016, p. 6). In addition, understanding historical power structures that have contributed to contemporary outcomes is critical to adequately evaluating the ways that current power structures contribute to or weaken resilience. Due to social and economic inequities, not everyone in the food system is equipped to pursue their own resilient livelihoods, but with access to various forms of capital, resilient livelihoods may be achieved. Promoting community food justice is intertwined with perpetuating self-reliance, given that food justice paradigms frequently grapple with the question of whose responsibility it is to support agricultural producers and provide access to healthful food. The expectation that resources beget resilience has been thought to perpetuate lack of larger governmental support for marginalized communities, all too often expected to advocate on their own behalf rather than receive the support they need through a resilient system that centers their needs (Walsh-Dilley et al., 2016).

Place-based economics

Similar to community self-reliance, place-based economics contributes to resilience by focusing on the local capacity of the system (Faulkner et al., 2018). Resilience is strengthened by the social cohesion and dedication to the local economy and the success of local systems (Faulkner et al., 2018). Indicators of place-based economics are designed to reflect the scale of the system, where the number of indicators needs to be implementable in order to allow for adequate comparisons across communities (Ludden et al., 2018). Integrated place-based food networks lead to entrepreneurship and innovations, and consequently to social, economic, and ecological resilience. Further, a focus on the locality or regionality of food hubs, and associated market opportunities, can support food systems resilience, especially with respect to institutional purchases across operation scales (Duncan et al., 2018).

Community Food System Resilience Indicators and Frameworks

A number of resilience frameworks have been developed to assess food and agriculture systems. The New Natural Resource Economy, an economic development framework, was used in Oregon to assess the resiliency of regional food systems in the state to make policy recommendations at the local, regional, and federal levels. Findings indicated a need for mandatory funds to improve capacity among small farms (Duncan et al., 2018). Duncan et al. also concluded that current evaluation and measurement tools at the regional, state, and local food system levels are "expensive and complex" (2018, p. 5), but those processes play

a significant role in assessing food systems resilience.

Cabell and Oelofse (2012) developed a behavior-based indicator framework to assess agroecosystem resilience. The framework is intended to enable communities to identify existing vulnerabilities within the SES and to assess where action can be taken to strengthen resilience. Indicators were developed based on SES resilience theory, spanning social, economic, and environmental categories, and were subsequently applied to an agricultural, or food system, context. While the framework was developed to consider systems greater than the individual, it also ensured that individual voices can be heard (Cabell & Oelofse, 2012).

Ludden et al. (2018) developed the Progressive Agriculture Index using indicators from existing data sets across more than 2,900 U.S. counties. These indicators included, for example the percentages of female or non-white principal farm operators, the average wages of farm workers, and the number of farms using direct-sale methods per 10,000 residents, to measure how an agricultural system impacts social, economic, and environmental conditions (Ludden et al., 2018).

Some studies have sought to determine which qualities contribute to and are most important in determining resilience in specific locales (Faulkner et al., 2018; Worstell & Green, 2017). These studies support the notion that indicators of specified resilience are community-contingent, and that concepts within community and food systems resilience frameworks are beginning to merge. For example, the sustainability/resilience index used case studies in Tennessee, Arkansas, and Mississippi to assess the common qualities of resilient self-organized food systems in the U.S. South (Worstell & Green, 2017). Worstell and Green (2017) developed the acronym *CLARDIET* to describe the characteristics of a resilient food system, highlighting eight concepts of resiliency: Connected, Local, Accumulates reserves, Redundancy, Diversity, Innovation, Ecological integration, and Transforms itself. They further described how each indicator can be achieved, through federal policy, regional networks, communities, groups of farms, farm families, and individuals.

Methods

The purpose of this study was to develop, based on expert consensus, an indicator framework—in the form of a community food system resilience audit tool—that can be used by community stakeholders to assess their community's current level of resilience and identify opportunities for improvement. The tool was developed to highlight the above-discussed themes in food systems resilience: agricultural and ecological sustainability, community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics.

We conducted a three-phased Delphi study (Hsu & Sandford, 2007) from June through October 2021 to identify expert consensus on the core indicators to assess community food systems resilience. We chose the Delphi technique because it provides a means for "structured anonymous communication between individuals who hold expertise on a certain topic with a goal of arriving at a consensus in the areas of policy, practice, or organizational decision making" (Birdsall, 2004; Brady, 2015, p. 1). The panel assembled for this study included a purposive sample of 15 experts. Purposive sampling identifies the group members from whom the practitioner can learn the most and is based on a set of specific criteria (Dooley, 2007). We invited 41 experts to participate based on their expertise and contributions to food systems resilience. The invited panelists had professional foci and expertise related to small, medium-size, and large farms, and to food systems and public health, rural sociology, and local food marketing. While Delphi studies differ in the number of panelists they engage, a panel with 10–15 similar panelists has been recommended as the ideal number (Delbecq et al., 1975). The panelists represented a breadth of organizations, including nonprofits and universities in the U.S. and Canada, with representation from urban and rural areas and from minority and under-served populations.

Delphi Panel

A working group for the community food system resilience audit tool was assembled by North American Food Systems Network (NAFSN) and

included researchers from several academic institutions, including both land-grant and non–land-grant universities, and representation from nonprofits and community-based organizations. The purposive sample for the Delphi panel included the original working group members and was bolstered by nationally recognized independent scholars, authors, food systems advocates, and members from other U.S. and Canadian universities, including the following:

Universities

- First Nations Technical Institute (an Indigenous-run higher education institution)
- Indiana University, Center for Rural Engagement
- Iowa State University
- Johns Hopkins University, Center for a Livable Future
- Kwantlen Polytechnic University, Institute for Sustainable Food Systems
- Lakehead University
- Middlebury University
- Ohio State University, Initiative for Food and Agricultural Transformation (InFACT)
- University of Florida, Institute of Food and Agricultural Science
- University of Virginia, Institute for Environmental Negotiation

Nonprofits

- American Farmland Trust
- Cultivate Charlottesville (Charlottesville, Virginia)
- Florida Food Policy Council
- Lyson Center for Civic Agriculture and Food Systems, a project of the Center for Transformative Action, a nonprofit affiliate of Cornell University
- McIntosh Sustainable Environment and Economic Development (S.E.E.D.) (Darien, Georgia)

Data Collection and Analysis

Although various formats exist, the majority of Delphi studies adhere to three structured rounds, starting with open-ended questions that advance towards more structured questions in subsequent rounds "in order to verify previous consensus, test prepositions, and finalize decision-making models" (Brady, 2015, p. 3). Our study modified this standard format, as the items that were presented to the panel in the first round were developed by the above-mentioned working group of food systems experts, who worked independently and collaboratively over the course of 18 months to identify policies, programs, and initiatives that are salient indicators of resilience. The large working group contained subgroups focused on developing indicators based on group members' areas of academic expertise or practical experience.

The initial indicators were developed and discussed by the subgroups, and then discussed, ranked, and revised by the whole working group. After multiple rounds of revisions, the working group identified six core values which support and animate efforts to improve community food systems resilience and that should be used to guide community food systems resilience policy and program adoption. The panelists were asked to rate the importance on a Likert scale (1=Not at all important to 5=Very important) of values that inform efforts to improve community food systems resilience. These values can be understood as the foundational goals or motivations of food systems approaches to community development. The initial six values that the working group identified were: community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics.

The working group identified 38 benefits of adopting these policies and programs. These perceived benefits serve as the reasons for adopting these policies—they provide the justification for pursuing policies to improve food systems resilience by highlighting the outcomes or impacts that can be expected. In practical terms, these perceived benefits can be derived from implementing the policies included in the community food system audit tool in the Appendix. While any specific benefit would likely only be achieved in connection with a specific policy—for example, the benefit of maintaining productive and sustainable use of farmland would only follow from adopting policy

that supports maintenance—these benefits can be understood as the suite of benefits that could be realized by adopting a range of policies to support community food systems resilience. In keeping with the overall purpose of this study, identifying the potential benefits of policy adoption can help to justify local governments devoting time and resources to policy development and adoption. The expert panel was also asked to rate their level of agreement on the potential benefits of implementing policies to support food systems resilience (1=Strongly disagree to 5=Strongly agree).

Finally, the working group identified 109 indicators of community food systems resilience, such as the presence of specific policies, programs, and initiatives that could be adopted or enacted by local governments. Thirty-six are primary indicators and 73 are sub-indicators. The sub-indicators can be thought of as policies, programs, and practices that can be implemented as a means to achieving primary indicators. For example, a primary indicator is "Jurisdiction takes steps to keep food and agricultural waste out of landfills and demonstrates commitment to recycling/reusing food and agricultural waste." In the initial round of review, this primary indicator had four sub-indicators: agricultural composting, residential composting, food rescue, and gleaning.

The indicators of community food systems resilience were organized into seven core themes, which align with, but are not equivalent to, the six values the expert panel identified, based on their knowledge and experience of how such policies have been used effectively at the community level, that are important to guiding community food systems development. The seven core themes for policies and programs were:

1. **Agricultural and ecological sustainability—**Conservation of natural resources in local agriculture and ecosystems.
2. **Community health**—Access to nutritious, affordable, and culturally appropriate foods.
3. **Community self-reliance**—Protecting against instability of and external threats to the food supply chain.
4. **Distributive and democratic leadership—**Providing broad access to leadership and decision-making authority among all stakeholder groups in a community, including those that have been historically marginalized.
5. **Focus on the farmer and food maker—**Protecting farmland and including concerns of farmers and processors in planning decisions, and providing financial resources toward local food system development.
6. **Food justice—**Improving food access to all segments of the population and bringing an end to the structural inequalities that lead to unequal health outcomes.
7. **Place-based economics**—Enhancing local control and ownership of food system resources and influencing the development of relevant infrastructure.

In the first round, expert panelists were presented with the six core values, 38 benefits, and 109 indicators that had been developed by the working group using a 5-point scale (1=Not at all important to 5=Very important, and 1=Strongly disagree to 5=Strongly agree). We used an a priori definition of consensus as two-thirds of the expert panel selecting a 4 or 5 (Important or Very important, Agree or Strongly agree) for a value, benefit, or indicator to be retained in the study.

The first round of review occurred between June and July 2021. Unique to this round, in addition to answering the Likert-scale questions, participants could suggest new values, benefits, and indicators. They were also given the opportunity to make comments and propose revisions to existing values, benefits, and indicators. In each section of the Delphi instrument—values, benefits, and each of the seven indicator groups—there was an open response box provided for the panel to suggest new items or propose revisions to items in the section. Items that did not meet the two-thirds threshold were deleted. Two members of the research team independently reviewed the open responses. Each reviewer developed their own wording for new items and revisions to existing items to account for cases when more than one panelist suggested additions or revisions. The two researchers compared their analyses of the proposed additions and revisions. In cases of disagreement, the

researchers reviewed the comments from other sections of the study to see whether proposed changes had already been accounted for. For example, some panelists suggested adding items related to justice and equity early in their review of indicators (e.g., in the section on community self-reliance), but those indicators were already present later in the food justice category. Since there were two more opportunities for the panel to provide feedback on the items, the researchers were inclusive in adding new proposed items that were not already included elsewhere. In most categories, some items were revised, new items added, and some were deleted. These changes are discussed in more detail in the results section.

Twelve respondents completed round two of the study between August and September 2021. We used the second round to refine the list as it had been revised and added to from the panel's feedback to the initial set of indicators provided in round one. The panelists again indicated their level of agreement on the importance of each item using a 5-point Likert-type scale of importance. In this round, panelists could no longer suggest new indicators, but they could provide general comments. Fifteen indicators were eliminated.

Ten respondents completed round three of the survey in October 2021, in which they again ranking the remaining items using the 5-point Likert-type scale. Another twelve items were removed. We used the results from this round to develop the final community food system resilience audit tool. This research was approved by University of Florida Institutional Review Board (IRB #202101143).

Results

The total number of core values after round one held constant at 10 for the remaining rounds. The perceived benefits of community food systems policies were whittled down each round, from 38 to 20. The community food system indicator list ended with 96 indicators. Only one category maintained the same indicators throughout: the five place-based economic indicators. For the categories of agricultural and ecological sustainability, community health, and community self-reliance, there were both additions and deletions after round one, with continued attrition in the subsequent rounds yielding final tallies of indicators that were just slightly below the total number of initial indicators. Only one category, distributive and democratic leadership, had a final tally of indicators (11) that was higher than the initial list (9), and the indicators in that category held constant from after the first round to the end. Table 1 gives an overview of

Table 1. Summary of Indicators by Category and Round

		Number of indicators after		
Category	Initial	Round 1	Round 2	Round 3
Core values	6	10	10	10
Perceived benefits	38	30 [+7] [–15]	25	20
Agricultural and ecological sustainability	23	22 [+2] [–3]	21	18
Community health	13	14 [+2] [–1]	14	12
Community self-reliance	14	14 [+6] [–6]	12	11
Distributive and democratic leadership	9	11	11	11
Focus on the farmer	17	17 [+1] [–1]	15	14
Food justice	28	30	25	25
Place-based economics	5	5	5	5
Total	153	153	138	126

the numbers of indicators by round of review. For round one, the only round in which there were additions, we have noted in brackets the number of indicators added and those deleted to yield the total in that category, such as the addition of 7 and the removal of 15 perceived benefits in round one to yield a net reduction of 8 benefits from the 38 on the initial list.

Core Values

The expert panel's ranking of the values underpinning policies to support community food systems resilience yielded a final total of 10. As stated above, to be retained all items needed to be rated as important or very important (4 or 5) by at least two-thirds of the panelists; the mean score for each item is in parenthesis, with 5 the highest possible score. Table 2 gives the 10 values, listed in descending order by the panel's mean score.

Perceived Benefits of Policies to Support Community Food System Resilience

The expert panel reached consensus on 20 core benefits of implementing policies to support community food systems resilience. To be included, at least two-thirds of respondents needed to agree or strongly agree (rate as 4 or 5) that it was a benefit; the mean score is included for each item, with 5 the highest possible score. The final list of perceived benefits and mean scores is in Table 3.

Table 2. Core Values Guiding Community Food Systems Policies and Programs

Topic	Mean Score
Agricultural and ecological sustainability Promotes conservation and wise use of natural resources in local agriculture and supports ecological integrity by stewarding and protecting thriving ecosystems	4.8
Community health Improves community residents' wellness through education and enhanced access to nutritious, affordable, and culturally appropriate foods	4.8
Place-based economics Enhances local control and ownership of food system resources	4.7
Human Infrastructure Having a population equipped with the knowledge, skills, practices, tools and other equipment, relationships, and other food system components that enable production of food in the local ecosystem and cultural context, and enhances capacity for realizing other values	4.6
Food sovereignty Supports self-determination of BIPOC peoples in regenerating and stewarding their chosen foodways	4.5
Focus on the farmer and food maker Builds and strengthens local family farms and food-based businesses by adopting agriculture-friendly policies and championing market access and diversification strategies	4.4
Community self-reliance Protects community members against instability of and external threats to food supply chain	4.3
Distributive and democratic leadership Provides broad access to leadership and decision-making authority among all stakeholder groups in a community, including those that have been historically marginalized, and institutional transparency to build trusting relationships	4.3
Food justice Regards access to nutritious food as a human right and seeks both to improve food access for all segments of the population and bring an end to the structural inequalities that lead to unequal health outcomes	4.3
Racial justice Incorporating and operationalizing Justice, Equity, Diversity, and Inclusion (JEDI) principles in the food system	4.1

Indicators of Food Systems Resilience

All the indicators in the audit tool were subject to the same rating criteria for inclusion—two-thirds of the expert panelists viewed them as important or very important. We ended with 35 primary indicators and 61 sub-indicators, which was a net reduction in one primary indicator and 12 sub-indicators. These results indicated robust consensus regarding primary indicators, with less support for the importance of specific means to achieve those goals.

It is important to note that while the remaining sub-indicators were supported by expert consensus, there are a number of additional policies, programs, and initiatives—beyond those included in the community food system resilience audit tool—that if adopted could also potentially foster development of the 35 primary indicators. Therefore, this list of sub-indicators should not be regarded as comprehensive, but rather broadly suggestive of the types of policies, programs, and initiatives that could be adopted by community stakeholders to bolster the resilience of their local food system, depending on the specific local conditions. An overview of the primary indicators that correspond to the seven core themes is provided below, while the full list of the indicators and

Table 3. Perceived Benefits of Adopting Community Food Systems Resilience Policies and Programs

Benefit	Mean Score
Supports agricultural and ecological sustainability	4.6
Has the potential to retain and expand food and farming-based livelihoods and employment opportunities.	4.5
Increases sense of community and creates social capital	4.5
Accumulates productive infrastructure, from healthier soils to processing and storage facilities	4.4
Maintains greater stability and reduces vulnerability to food supply chain disruptions	4.3
Helps maintain productive and sustainable use of farmland	4.3
Keeps greater share of revenue recirculating in local community	4.3
Fosters community participation in decision-making processes and promotes shared leadership	4.2
Increases prospects for local job creation	4.2
Gives residents/communities the right to define and assert greater control over their own food systems	4.2
Supports culturally significant and community-valued foodways	4.2
Addresses legacy contamination and depletion of land, soil, and water resources and works to preserve and improve their condition	4.2
Creates a healthier working environment for farmers and farm workers	4.2
Protects and restores wildlife and wildlife habitat	4.1
Addresses historic disparities in human exposure to environmental contaminants and reduces exposure for all	4.1
Increases opportunities for food systems awareness and education	4.1
Creates community wealth and shared prosperity by investing in community assets and infrastructure, prompting increase in multiple forms of community capital formation	4.1
Addresses disparities in food access and quality of life among various population segments	4.0
Increases redundancy and diversity of supply chain components to reduce dependence on a single or few sources	4.0
Promotes development of realistic standard operating procedures for storing, delivering, and distributing food, and the provision of logistical support to needy residents and food businesses, especially during emergency periods	3.8

sub-indicators, with the mean score for each indicator and sub-indicator in parentheses, may be found in the Appendix.

Agricultural and Ecological Sustainability

Indicators in this section focus on promoting conservation of natural resources in local agriculture and ecosystems. Primary indicators in this theme include policies supporting water quality, animal welfare, food waste reduction, and soil conservation; policies reducing erosion, maintaining marine and wildlife habitat, and increasing carbon capture; and policies encouraging the adoption of food production and distribution practices aimed at reducing greenhouse gas emissions and fossil fuel dependence.

Community Health

Indicators in this section seek to improve wellness through enhanced access to nutritious, affordable, and culturally appropriate foods, and are further supported by indicators related to disaster and emergency management and planning. These indicators also specify that jurisdictions should monitor food system-related community health indicators as a partial measure of public health status, incorporate food availability as part of their general disaster/emergency planning responsibilities, and support greater equity and inclusivity by providing richer opportunities for collaboration and connection between local government and public health officials and communities of color on all levels: academic, professional, and grassroots. Primary indicators for this theme include policies supporting healthy food retail and procurement of local food by food banks and institutions, programs providing nutrition education and youth education, as well as fresh food access for limited-resource and limited-mobility residents.

Community Self-Reliance

Indictors of community self-reliance represent factors protecting against potentially destabilizing external threats to food supply chains, and provide opportunities for additional local food production. Primary indicators for this theme include: farmland protection strategies like development rights programs, conservation easements, and land trusts; policies to permit hunting and foraging; reducing barriers to starting new food production enterprises; implementing policies, ordinances, and zoning regulations that allow a greater variety of food production and small-scale processing within the community; affordable access to fresh water, mulch, compost, and other resources for community food growing programs; promoting increased consumption of locally produced food by households, public institutions, and commercial enterprises; and identification and utilization of land for food production across urban, suburban, and rural areas.

Distributive and Democratic Leadership

Indicators of distributive and democratic leadership are exemplified by communities providing broad access to leadership and decision-making authority among all stakeholder groups, including those that have been historically marginalized, building diverse stakeholder coalitions and networks, and building economic resilience and enhanced risk management through cooperation and partnership. Primary indicators for this theme include providing targeted education by the jurisdiction to build capacity of stakeholders in the community to become more actively engaged in the local food system; taking active steps to ensure that stakeholder groups are appropriately diverse and broadly representative of the communities they serve, based on race, ethnicity, age groups and gender; providing formal organizational support of local food system activities; and fostering the creation/growth of cooperatives, collective marketing networks, and expanded local control of food production, processing, distribution, and marketing.

Focus on the Farmer and Food Maker

Primary indicators for this theme include jurisdictions taking active measures to protect and preserve farmland for agricultural production purposes, establishing policies and programs to ensure that farmer/processor concerns are included in community and emergency planning decisions, and directing available financial resources toward local food systems development.

Food Justice

Indicators in the food justice category address access to nutritious food as a human right and seek both to improve food access for all segments of the population and bring an end to the structural inequalities that lead to unequal health outcomes. These policies acknowledge the inequities and injustice in the food system; strive to build stronger communities by responding to people's needs in all population segments; provide opportunities for Black, Indigenous, People of Color (BIPOC) farmers and food purveyors to strengthen their position within the local food supply chain and obtain better access to infrastructure and market outlets; promote and support the informal agricultural sector to enhance household and community self-sufficiency, entrepreneurship, and food sovereignty; and create mechanisms, such as local food policy councils, that ensure regular communication and mutual exchange between governmental, business, nonprofit, and community-based entities. Primary indictors under this theme include jurisdictions identifying and publicly acknowledging inequities and injustice in the local food systems, developing programs and policies that provide direct support to lower-income households struggling with food insecurity, investing in BIPOC-owned and operated farms and food businesses, establishing ordinances that support household-level food production and related allowable and accessible uses, and operating local food policy councils to elevate the concerns of local food system stakeholders as a matter of public policy.

Place-based Economics

Indictors for this theme focus on ways to enhance local control and ownership of food system resources: advancing policies and programs that develop both a skilled and capable labor force that can participate successfully in the local agricultural or food sector, and relevant scale-appropriate infrastructure in support of more efficient local food processing and distribution. Primary indicators include investing in workforce training and professional development for jobs needed to sustain and expand local food supply chains and providing financial support and resource commitments toward the development of local food infrastructural assets.

Discussion

There is considerable variation in community food systems, including differences in climate, social and cultural norms, resource availability, and the degree of urbanization. Each of these dimensions creates unique challenges for developing shared values, positive outcomes of adopting community food systems policies, and identifying indicators that can be applied to all communities. Recognizing these potential obstacles, our expert panel consciously aimed to develop indicators that would be broadly applicable. In fact, some of the initial indicators identified—particularly certain sub-indicators—did not reach two-thirds consensus and were removed precisely because they failed to have broad applicability. For example, an indicator about requiring food production on university campuses was removed because the threshold number of panelists did not consider it to be applicable to most community food systems. The panelists noted that such a policy was beneficial but not what they viewed as most important in policies to support community food systems resilience. The general stability of the number of values, benefits, and indicators through the three rounds of the Delphi study highlight the expert panel consensus on the items that were eventually included in the values, benefits, and the audit tool.

We intend for the audit tool to be used by individuals and groups who are seeking to assess the resilience of their community food systems and identify goals that can improve their overall resilience. We also see this tool as useful for communities who have already identified an issue that they would like to address, such as community health, but would like guidance on specific policies and programs that could help support their goal(s). We intend for this tool to be useful to a range of audiences and communities. We anticipate it being most useful for local governments, food policy councils, and cooperative extension agents who work to support food systems and community health.

A research opportunity following from this project is to pilot test the use of the audit tool. The pilot test could focus on its use by different groups—including local governments, cooperative extension, food policy councils and others—as well

as communities ranging from urban to suburban to rural. The pilot test may identify opportunities to modify the audit tool to improve its practical applicability. An additional research opportunity would be to utilize the tool in conjunction with other sorts of community food systems assessments, such as asset mapping, to yield a potentially richer picture of the overall status of the resilience of community food systems. Indeed, while jurisdictions having policies and programs in place is an important factor in food systems resilience, there are often activities undertaken by community groups, cooperative extension, health departments, and economic development councils that also play important roles in the overall resilience of community food systems. Finally, conducting a longitudinal study that includes baseline and follow-up assessments of social and ecological indicators in the community following the implementation of policies and programs recommended by the audit tool involving areas such as food security, community nutrition, and soil and water quality, would be helpful in measuring the efficacy of the audit tool.

Limitations

Conducting a study that utilizes an expert panel yields results that are rooted in the quality of the assembled panel, and thus is beneficial to the extent that the perceptions of experts are sufficient to address the research question (Dooley, 2007). In the case of this study, while the members of our panel collectively brought both depth and breadth of expertise across the range of topics addressed in the tool, and represented small, medium-size, and large farms and various dimensions of food systems such as food access, equity, public health, and economic and community development, it is still the case that the audit tool was developed based on the selected group of panelists and not by assessing the outcomes of the adoption or implementation of policies.

While there is an inherent risk of excluding minority or historically marginalized viewpoints when doing a study based on expert consensus, our team sought to ensure that we had BIPOC representation on the expert panel. We also sought to ensure that we had representation not only from academic research experts on topics, but also nationally recognized leaders from nonprofits and community organizations who have practical experience working on community food systems policy advocacy, development, and implementation.

For the final round of the study, we only received participation from 10 members of the 15 original members of the expert panel. While 10 is an acceptable number of expert panelists for a Delphi study, the research team had hoped to have greater participation in the final round. However, the consistency of responses through the three rounds—following the year-long, iterative process of developing the initial list of indicators which preceded the three rounds of anonymous ranking—provides additional support for the validity of the audit tool, despite the more limited participation in the final round.

It is important to note that the mere existence of a policy without associated activities or support may have no practical impact; conversely, there may already be activities occurring in a community which do not have a formal policy associated with them. While a policy alone does not yield outcomes, identifying policy options to support community goals can be an important way to facilitate community engagement by providing a supportive environment for individuals and groups to work collaboratively alongside policy makers to achieve shared goals.

Finally, this study relies on assimilating existing views on improving community food systems; it does not present novel ideas about challenging the dominant perspectives on progressive food systems. However, while there is a need for novel ideas that challenge the status quo, the purpose of this study was to create a tool to align current viewpoints on resilience and to translate them into a useable tool for practitioners to conduct food systems assessments.

Conclusion

In the wake of the COVID-19 pandemic and increasing prevalence of natural disasters, awareness of the importance of community food systems resilience has become a part of public consciousness. Furthermore, with increasing awareness of the systemic injustices in our community food systems and their impacts on health disparities, it has

become clear that it is necessary to adopt policies to support food systems resilience that take into account both general *and* specific resilience so that the support of one goal does not reinforce inequality or reduce resilience in another part of the food system. The results of this Delphi study provide a comprehensive framework to address community food systems resilience to address the seven core themes we have identified that contribute to community food systems resilience: agricultural and ecological sustainability, community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics.

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Appendix: Community Food System Resilience Audit Tool

Indicators of Community Food System Resilience

Please mark whether these indicators are present in the community.

Theme 1: Agricultural and Ecological Sustainability

Promoting conservation of natural resources in local agriculture and ecosystem

☐ Jurisdiction adopts policies to support water quality, water conservation, watershed management. (4.7)

☐ Jurisdiction encourages the adoption of practices to address animal welfare. (4.3)

☐ Jurisdiction takes steps to keep food and agricultural waste out of landfills and demonstrates commitment to recycling and reusing food and agricultural waste. (4.1)

If so, has the jurisdiction enacted the following initiatives?

- ○ Agricultural composting (4.0)
- ○ Residential composting (3.8)

Soil conservation measures

☐ Jurisdiction encourages the adoption of soil health-promoting and conservation practices in agriculture. (4.7)

If so, does the jurisdiction encourage the following?

- ○ Cover crop use (3.9)
- ○ Crop diversification (4.1)
- ○ Crop rotation (4.2)
- ○ Use of windbreaks (3.8)

☐ Jurisdiction encourages preservation of natural land resources to reduce soil and land erosion, maintain marine and wildlife habitat, and increase carbon capture. (4.6)

If so, does the jurisdiction do the following?

- ○ Preserves coastal wetlands (e.g., salt marshes, seagrasses, mangrove forests) to create a buffer against floodwaters and maintain carbon sequestration. (4.3)
- ○ Preserves and creates vegetative buffer zones in riparian areas, using native trees, shrubs, grasses and plants, to reduce erosion and maintain water quality and wildlife habitat. (4.6)
- ○ Facilitates the adoption of agroforestry practices, which integrates management of forested lands with livestock and crop production, improves soil health, reduces soil erosion and increases carbon capture. (4.5)

☐ Jurisdiction encourages the adoption of food production and distribution practices aimed at reducing greenhouse gas emissions and fossil fuel dependence. (4.4)

If so, has the jurisdiction enacted the following policies?

- ○ Promotes use of renewable energy sources and/or electric vehicles in food transport and logistics. (4.2)
- ○ Restricts types of fertilizers that may be used on commercial farms. (4.1)
- ○ Restricts types of fertilizers that may be used on public or residential properties. (4.3)

Theme 2: Community Health

Improves citizen wellness through enhanced access to nutritious, affordable and culturally appropriate foods

☐ Jurisdiction supports equity and inclusivity by providing opportunities for collaboration and connecting with communities of color on all levels: academic, community, professionals, and grassroots organizers. (4.2)

☐ Jurisdiction monitors public health indicators as a measure of food system-related community health. (4.2)

☐ Jurisdiction has one or more farm-to-institution procurement programs (school, day care, hospital, prison). (4.2)

☐ Jurisdiction has policies promoting healthy food retail. (4.4)

☐ Jurisdiction provides fresh food access for limited-resource and limited-mobility residents (e.g., via mobile farmers market, fresh produce delivery van, etc.). (4.1)

☐ Community-based nutrition education and youth education programming is available in jurisdiction. (4.3)

☐ Jurisdiction encourages food bank(s) to source fresh food from local farms. (4.2)

Disaster and emergency management and planning

☐ Jurisdiction incorporates and prioritizes food availability and access issues as part of its general disaster and emergency planning responsibilities. (4.1)

If so, has the jurisdiction done the following?

- ○ Emergency and disaster plans are integrated and coordinated with other emergency relief and food access activities slated to take place in the jurisdiction and broader region. (3.9)
- ○ Emergency provisions include specific acquisition and storage recommendations for household members, food retailers, public agencies, and relevant nonprofit organizations. (3.8)
- ○ Information about disaster and emergency plans, the conditions that trigger their adoption and their expected impact is regularly and widely shared with local government officials, non-governmental stakeholders, and members of the public. (3.8)
- ○ Disaster and emergency management planning is informed by feedback solicited from as wide a range of local stakeholders as possible to reduce the chances of overlooking critical information. Stakeholder engagement is facilitated by meeting people where they are, through public meetings, interviews, and outreach activities. (3.8)

Theme 3: Community Self-Reliance

Protects community members against instability of and external threats to food supply chain

- ☐ Jurisdiction actively supports farmland protection strategies like development rights programs, conservation easements, and land trusts, among others. (4.7)
- ☐ Jurisdiction adopts policies to allow hunting and foraging. (4.1)
- ☐ Jurisdiction takes steps to reduce barriers to starting new food production enterprises. (4.6)
- ☐ Jurisdiction adopts policies, ordinances, or zoning regulations to allow food production, the cottage food industry, and small-scale processing within the community. (4.8)
- ☐ Jurisdiction actively supports affordable access to fresh water, mulch, compost, and other resources for community food growing programs. (4.5)
- ☐ Do the producers in your community produce food for local consumption? This includes personal household consumption, food service use, commercial sale, and donations to food insecure residents, produced within the boundaries of the jurisdiction.

  If so, has the jurisdiction done the following?

  - ○ Community produces food on privately operated commercial farms (over $1,000 in annual sales volumes). (3.9)

Opportunities for additional local food production in the jurisdiction

- ☐ Does the jurisdiction have property that has the potential to be used for additional food production? This includes food production by local growers and ranchers for local consumer markets.

  If so, does the jurisdiction take on opportunities for additional local food production in the following ways?

  - ○ Unplanted, arable land is available in the jurisdiction that could be used by current farmers for additional food production. (4.0)
  - ○ Unplanted, arable land is available in the jurisdiction that could be used by Community land bank programs give new or beginning farmers for additional food production. (4.5)
  - ○ Jurisdiction actively supports soil remediation measures and construction of raised beds to enable food production in contaminated locations. (4.0)

Theme 4: Distributive and Democratic Leadership

Provides broad access to leadership and decision-making authority among all stakeholder groups in a community, including those that have been historically marginalized

- ☐ Jurisdiction provides education to build capacity of stakeholders in the community to become leaders, champions, ambassadors, or otherwise become more actively engaged in the local food system by fostering links with mentors and leadership training opportunities. (4.5)
- ☐ Jurisdiction actively involves a broad range of stakeholders including individuals from all races, ethnicities, age groups, and gender identities. (4.3)

Building diverse stakeholder coalitions and networks

☐ Jurisdiction provides formal organizational support of local food system activities. (4.5)

If so, has the jurisdiction enacted the following initiatives?

- ○ Operates a food policy council devoted to creating and/or promoting a more resilient local food system through information exchange, networking, identification of priority needs, and program development and implementation. (4.4)
- ○ The food policy council strives for its membership to be demographically representative of the jurisdiction's population. (4.5)
- ○ The food policy council observes protocols for maximizing transparency (such as advertising open public meetings, and issuing and archiving public minutes). (4.3)
- ○ Local industry representatives provide mentoring guidance to new business entrants on food business development and operations. (3.7)

Builds economic resilience and enhances risk management through cooperation and partnership

☐ Jurisdiction fosters the creation and growth of cooperatives, collective marketing networks and expanded local control of food production, processing, distribution, and marketing. (4.4)

If so, has the jurisdiction enacted the following initiatives?

- ○ Jurisdiction fosters the creation and/or growth of formal agricultural cooperatives that sell local food to local markets. (4.2)
- ○ Jurisdiction fosters the creation or growth of marketing networks (other than formal cooperatives) that enable multiple producers to share equipment, packing, distribution, and/or transportation expenses involved in supplying locally produced food to local markets. (4.4)
- ○ Jurisdiction fosters the creation and/or growth of cooperatively owned food retail venues that showcase locally grown foods, promote socially responsible practices in the food supply chain, and provide economic benefits to members. (4.4)

Theme 5: Focus on the Farmer and Food Maker

Protects and preserves farmland

☐ Jurisdiction takes active measures to protect and preserve farmland for agricultural production purposes. (4.5)

If so, has the jurisdiction enacted the following initiatives?

- ○ Agricultural overlay zones have been established that preserve agricultural land from increased residential or commercial development, and/or identify specific permitted, accessory, and conditional agricultural uses. (4.5)
- ○ Administers programs that actively match new or beginning farmers with farmland available for lease or purchase. (4.4)
- ○ The jurisdiction works closely with and supports cooperative extension to provide for the critical needs of farmers and food-makers. (3.8)

☐ Jurisdiction has policies or programs to ensure that farmer and processor concerns are included in community and emergency planning decisions.

If so, has the jurisdiction enacted the following initiatives?

- ○ Jurisdiction operates an agricultural advisory board, composed primarily of farm representatives, that provide guidance to local government on policy decisions. (4.1)
- ○ Local industry representatives (current or retired) provide formal mentoring guidance to new business entrants on food business development and operations. (4.1)
- ○ Jurisdiction offers food business accelerator or food technology programs that provide an economical mechanism for testing the feasibility of value-added food products for the retail market without requiring substantial upfront capital investment. (4.2)

☐ Jurisdiction directs available financial resources toward local food system development.

If so, has the jurisdiction enacted the following initiatives?

- ○ Entities in the jurisdiction administer a grant program or low-interest loan fund that provides affordable capital to small and beginning agricultural enterprises. (4.2)
- ○ Stakeholders from local governmental or nonprofit organizations collaborate with local food supply chain actors to secure targeted grant funding from State or Federal agencies. (4.1)
- ○ Stakeholders from local governmental or nonprofit organizations within the jurisdiction collaborate with local food supply chain actors to secure targeted grant funding from private foundations or mission-driven financial institutions. (4.1)
- ○ Community Development Financial Institutions (CDFIs) in the jurisdiction provide funding to local food system initiatives, either with the help of financial assistance awards offered by the Healthy Food Financing Initiative or other means. (4.1)
- ○ Private agricultural lending institutions, such as members of the Farm Credit Council, provide financial support to local food producer or processors in the jurisdiction. (3.8)

Theme 6: Food Justice

Acknowledgement of the inequities and injustice in the food system

☐ Does the jurisdiction identify and publicly acknowledge existing inequities and injustice in the local food system?

If so, does the jurisdiction participate in the practices below?

- ○ Jurisdiction uses information obtained during public listening sessions to plan and implement corrective steps related to inequities in the food system. (4.1)
- ○ Jurisdiction connects people from historically disadvantaged backgrounds with resources in their community. (4.1)

- ○ Jurisdiction seeks input from historically marginalized farmers to ensure that their needs and preferences are included in policies and activities. (4.5)

- ○ Jurisdiction supports land back and land reparations for BIPOC farmers. (4.1)

Building stronger communities by responding to people's needs in all population segments

☐ Do the programs and policies in the jurisdiction provide direct support to lower-income households struggling with food insecurity?

If so, has the jurisdiction enacted the following initiatives?

- ○ Public or nonprofit entities within the jurisdiction conduct programs that coordinate the provision of healthful, fresh food to food-insecure households. (4.4)

- ○ Nonprofit or public agencies within the jurisdiction have either adopted incentives or relaxed procurement rules to encourage a greater share of food purchases from local sources. (4.5)

Provides opportunities for BIPOC farmers and food purveyors to strengthen their position within the local food supply chain and obtain better access to infrastructure and market outlets

☐ Does the jurisdiction invest in BIPOC-owned and operated farms or food businesses?

If so, does the jurisdiction participate in the following practices?

- ○ Invests in BIPOC-owned and operated farms and food businesses through direct grants or low interest loan funds. (4.5)

- ○ Targets the reduction of the BIPOC unemployment rate (especially among youth) as an explicit policy goal by identifying potential job opportunities within the local food system. (4.2)

- ○ Invests in training for aspiring BIPOC farmers and food producers. (4.3)

- ○ Helps secure targeted grant funding from State or Federal agencies that supports the development of BIPOC-owned and operated farms or food businesses by identifying funding opportunities and/or providing grant writing resources. (4.3)

- ○ Helps secure targeted grant funding from private foundations or mission-driven financial institutions that supports the development of BIPOC-owned and operated farms or food businesses by identifying funding opportunities and/or providing grant writing resources. (4.4)

- ○ Facilitates lending to BIPOC-owned and operated farms and food businesses by public lending institutions (such as the U.S. Department of Agriculture Farm Service Agency). (4.2)

- ○ Facilitates lending to BIPOC-owned and operated farms and food businesses by private agricultural lending institutions, such as members of the Farm Credit Council. (4.3)

Jurisdiction promotes and supports the informal agricultural sector to enhance household and community self-sufficiency, entrepreneurship, and food sovereignty

☐ Zoning, licensing, and permitting ordinances support household-level food production and related allowable and accessible uses.

If so, does the jurisdiction allow the following?

- ○ Backyard poultry (4.1)
- ○ Farm stands (4.2)
- ○ Household composting (4.1)
- ○ Vegetable gardens in lieu of lawns (4.4)
- ○ Community land bank programs give residents a formal voice and input in determining neighborhood land use (often with the help of community advisory boards composed of local residents) (4.4)

Jurisdiction provides formal organizational support of local food system activities

☐ Jurisdiction operates a local food policy council to elevate the concerns of local food system stakeholders. (4.3)

If so, does the food policy council do the following?

- ○ Local food policy council creates and promotes a more resilient local food system through information exchange, networking, identification of priority needs, and program development and implementation. (4.6)
- ○ The food policy council strives to make its membership demographically representative of the jurisdiction's population. (4.6)

Theme 7: Place-Based Economics

Takes steps to develop skilled and capable labor force that can participate successfully in the local agricultural or food sector

☐ Jurisdiction invests in workforce training and professional development for jobs needed to sustain the local food system. (4.4)

If so, has the jurisdiction enacted the following initiative?

- ○ Stakeholders from local jurisdiction pursue educational credits and/or certificates in local food leadership curricula or similar professional credentials aligned with the labor and skill requirements of local food systems (offered by many land-grant institutions online or in person). (4.0)

Develops relevant infrastructure in support for local food distribution

☐ Jurisdiction provides financial support and/or resource commitments towards the development of local food infrastructural assets. (4.2)

If so, has the jurisdiction enacted the following initiatives?

- ○ Support for local food distribution infrastructure (e.g., food hubs and aggregation sites, shared warehouses and cold storage facilities). (4.3)
- ○ Support for local food packing and processing infrastructure (e.g., shared-use kitchens, co-packing operations, permanent and mobile meat and poultry slaughter facilities). (4.2)