frontiers | Frontiers in Sustainable Food Systems

TYPE Original Research
PUBLISHED 29 January 2025
DOI 10.3389/fsufs.2024.1490923

OPEN ACCESS

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RECEIVED 04 September 2024
ACCEPTED 26 December 2024
PUBLISHED 29 January 2025

CITATION
Zougris K, Miles AF, Benjamin R and Geismar E (2025) Forming a national community of practice of food system planning initiatives aligned with the United Nations Sustainable Development Goals. *Front. Sustain. Food Syst.* 8:1490923. doi: 10.3389/fsufs.2024.1490923

Forming a national community of practice of food system planning initiatives aligned with the United Nations Sustainable Development Goals

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Introduction: This paper is designed to identify key factors informing the process of developing a United States-based national community of practice of state and regional food system planning efforts aligned with the United Nations Sustainable Development Goals.

Methods: Grounded in an extensive literature review, we employed an exploratory sequential mixed methods design to assess the needs, functions, challenges, and likelihood for participation in a national community of practice aligned with the United Nations Sustainable Development Goals. Data drawn by a series of semi-structured interviews with 25 leading experts, complemented by a set of self-administered online surveys of 35 practitioners of food planning efforts across the nation.

Results: Our integrative findings revealed overwhelmingly interest and need for the development of a national community of practice aligned with the United Nations Sustainable Development Goals. The findings further indicate that in the process of developing a national community of practice, the principles and functions of shared governance, mutual trust and collective fundraising are essential to supporting credible and coordinated activities that promote equity, reinforce capacity building, promote research on food system measurements, and strengthen advocacy for systemic transformation aligned with the UN Sustainable Development Goals. Finally, our study revealed a rampant interest in collaboration and knowledge sharing in various stages of the formation of a national community of practice. The majority of the participants appear to be familiar, yet only a small fraction of their organizations appear to be formally aligned with the UN Sustainable Development Goals.

Discussion: Our integrative findings emerge with Wenger's conceptual framework offering a suitable theoretical grounding in the process of developing a community of practice in food systems planning. The implication of this study denotes the importance of collaboration among academic research institutions, legislators and FPEs within the community that can spur adaptation, innovation, and integration in food system planning, policy, implementation, and monitoring. Coordination in pooling resources and aligning efforts can lead to more efficient use and allocation of funds, ensuring that investments are directed toward the most impactful practices aligned with state and regional food system initiatives and planning efforts.

KEYWORDS

food systems planning, sustainability, United Nations Sustainable Development Goals (SDGs), community of practice, mixed methods

Introduction

Despite the increasingly urgent need for food system transformation (Webb et al., 2020; Zurek et al., 2022), research has shown that the USDA has historically underfunded research, education, and planning for the development of agroecology and sustainable food systems (DeLonge et al., 2016). Limited funding is currently available to support individual state or regional food system planning efforts, with no funding currently dedicated to developing and coordinating a national network community of practice of state and regional food system planning initiatives (Bell, 2013). How agri-food systems are planned, developed, and managed, will have an overwhelming influence on the ability of global society to restore and sustain critical ecosystems services, mitigate, and adapt to climate change, and ensure food security, human health, and well-being into the future (Harris and Spiegel, 2019; Agyemang and Kwofie, 2021; Miles and Hoy, 2023; Campbell B. M. et al., 2017). State and regional food system planning in the US and internationally will be increasingly necessary to meet the long-term economic, ecological, cultural, public health and food security needs of citizens under the anticipated ecological and social shocks of global environmental change (Tendall et al., 2015; Béné, 2020; Zurek et al., 2022).

Since the publication of Pothukuchi and Kaufman's (2000) seminal article highlighting the absence of food systems within the field of urban and regional planning, food systems have received growing recognition and attention from both practitioners and academics (Karetny et al., 2022; Viljoen and Wiskerke, 2012; Soma and Wakefield, 2011). The American Planning Association's (APA) Policy Guide on Community and Regional Food Planning further cemented the legitimacy and institutionalization of food systems planning within the planning field (Pothukuchi, 2009), a recognition that has been coupled with growing academic interest in the role of food systems within urban planning practices (Cabannes and Marocchino, 2018; APA Food Systems Division, 2024). Food system planning efforts (FPE) have cropped up across the country in local, regional, and state contexts. According to Hoey (2022), 60 % (60%) of U.S. States have an active state-level food systems plan, or one underway, engaging in a system-based and cross-sectoral approach. According to data pulled from the USDA-funded *Growing Food Connections*, as of 2017, over 200 food-related plans and policies had been adopted at the local level (see Communities of Innovation, 2023; Raja et al., 2017).

Although there are many food system planning efforts at the city, state and regional-levels, such efforts are not currently networked or coordinated into an efficient, well-structured and high-functioning set of complementary operations as a national-level community of practice. An integrated US food planning national community of practice (NCoP) has the potential to accelerate state and regional food system planning efforts toward the promotion of health, equity, resilience, and sustainability in accordance with regional, state and United Nations Sustainable Development Goals (SDGs) (Caron et al., 2018; Herrero et al., 2020; von Braun et al., 2023).

While there is a growing interest in city, regional and statewide food system planning efforts, there is a lack of data and understanding of the need, key functions, and processes through which to develop and implement a national community of practice in food system planning efforts. In this article, we employ an exploratory mixed-method research design exploring and describing the process of developing a NCoP of Food Planning Efforts[1] (FPEs) aligned with the UN SDGs. Our study is designed to empirically explore a multilayered sequential research objective aiming to: (1) to detect and classify the perceptions of lead practitioners on the current needs in food system planning efforts in the United States; (2) to assess the extent of awareness of the UN SDGs among experts/practitioners in food planning in the United States; (3) to assess expert willingness to participate in the process of developing a NCoP of food system planning efforts aligned with the UN SDGs; (4) detect the suggested core functions of a NCoP of food system planning efforts linked to UN SDGs; and (5) recommend a framework informing an specific action plan in the designing, development and implementation of a NCoP aligned with the UN SDGs.

Networks of food system planning efforts

The essential function of FPEs are to inform governments to "rethink food systems governance and institutional arrangements to promote inclusive collaboration, embracing a variety of voices instead of individual and sectoral perspectives" (Community of Practice on Food Systems Approach on the Ground, 2023). Additionally, they provide the opportunity to embrace a more democratic participation method and amplify voices that are not normally included within formal governance structures (APA Food Systems Division, 2024). These plans are often led by food policy groups, or backbone organizations (Kania and Kramer, 2013) whose central goal is to facilitate a space for formal and informal collaborative engagement among stakeholders across diverse food sectors from production to consumption (Blay-Palmer et al., 2016). Interest in food systems planning has been the focus of extensive academic attention (Cabannes and Marocchino, 2018; Karetny et al., 2022), research centers[2], and an increasing number of practitioner-focused resources. These resources explore how successful food systems plans and FPEs are created and implemented toward meaningful transformation to address the significant negative externalities of the industrialized food system (Hendriks et al., 2023; FAO, 2023), promote healthy and sustainable food systems (Lawrence and Friel, 2020) and a range of specific values-based economic, social, public health and environmental outcomes (Karetny et al., 2022; Nemes et al., 2023). Hoey (2022) noted that these FPEs are most effective when institutionalized within formal state and regional governance structures, when new policy windows are created, when FPEs are well organized and prepared, when they capture political attention, and build broader networks. Much of this happens through the dissemination of ideas, and shared knowledge with other stakeholders. Significant initiatives of some network-sharing bodies have been created within FPEs. At the national level, this includes the American Planning Association's Food Systems Division (APA Food Systems Division, 2024), the Association of Collegiate Schools of Planning, the Association of European Schools of Planning, and the

1 Food Planning Initiatives, Food Planning Networks and Food Planning Efforts are used interchangeably in this article.

2 See, for example, Johns Hopkins University's Center for a Livable Future, Michigan State University's Center for Regional Food Systems, and Vermont Law School's Center for Agriculture and Food Systems.

United Kingdom Sustainable Food Cities Network (Sonnino and Beynon, 2015), as well as the *Growing Food Connections* research on Communities of Innovation (2023). Since 2021, the Michigan State University Center for Regional Food Systems (MSU CRFS) has been organizing the *Statewide & Regional Food Systems Plan Community of Practice*, a "multi-state community of practice that convenes leaders from current and emerging food system plan efforts across the country to increase collective knowledge and capacity to collaborate and strengthen local and regional food systems using an equity approach" (Michigan State University Center for Regional Food Systems, 2024). MSU CRFS is now in the process of forming the *Statewide and Regional Food System Plans National Community of Practice* informed by the findings described herein.

At the international level, a number of collaborative efforts have been established in the last decade, including, but not limited to: the Eat-Lancet Commission on Food, Planet, Health (Willett et al., 2019), the UN-sponsored Quito Declaration, which inspired city-based food systems transformations and projects (Hoey, 2022; Cabannes, 2012), and the UN-sponsored Community of Practice on Food Systems Approach on the Ground (CoP-FSAG), the latter of which "is a collaboration platform facilitated by the United Nations Environment Program (UNEP) to connect different institutions promoting and implementing food systems approaches toward delivering sustainable food systems at city and country levels (How to Effectively Transform Food Systems with New and Inclusive Governance, 2022). Additionally, the 260 municipal signatories of the 2015 Milan Urban Food Pact, an international pact between cities, aims to help share best practices toward sustainable urban food systems (Milan Urban Food Policy Pact, 2023). Despite the increasing urgent call for food system transformation (Webb et al., 2020; Fanzo et al., 2021; Schneider et al., 2023) and increased federal funding (USDA, 2024) and the development of food system planning efforts across US municipalities, states, and regions (Hoey et al., 2021; Hoey, 2022; Karetny et al., 2022), there is currently no cohesive framework, nor a national body that convenes key stakeholders as a professional community of practice, nor guides FPE efforts toward alignment with and realization of the UN SDGs.

Structural challenges to food system planning and systemic change

While both the practice of food systems planning, and the resources available to FPEs are growing rapidly, the field of food systems planning, and related initiatives faces numerous challenges in organization, knowledge, research, and implementation (Enthoven and Van den Broeck, 2021). A significant amount of research studies assess the effectiveness of food systems planning efforts (Deller et al., 2020; Campbell E. A. et al., 2017), while others examine the powerful nature of capitalist food regimes that limit systemic transformation of food systems toward sustainability and equity at the state, national and global levels (Wiskerke, 2009; Allen et al., 2017; McMichael, 2021; Pereira et al., 2020). Vitiello and Brinkley (2014) shed light on the process of emergence of food systems within the urban planning field in North America and denote that the long-held challenges to agri-food planning implementation originate, in part, from fragmented governance and policy silos, unequal power dynamics, land use and zoning conflicts, economic pressures and market forces, and insufficient institutional support, making it difficult to sustain initiatives and achieve transformative change. Among other larger structural factors preventing food system transformation, such as the vested interests of powerful corporate agri-food businesses, lack of federal research funding and federal policy landscapes that favors status quo (Béné, 2022), Calo et al. (2021) question the use of current Global North property regimes within existing efforts of food systems transformation, stating that the transformation of FPEs aim toward, may not come without reimagining the conceptual definition of property. Miles et al. (2017) posits that, beyond planning, a range of both policy incentives and disincentives must be enacted simultaneously at the US federal level to enable systemic transformation toward more sustainable food systems.

In order to address some of the structural challenges to effective food system planning and implementation, there is an emerging need for advancing transformative theory of change at scale across FPEs in the US. Dinesh et al. (2021) calls for the need to transform knowledge and innovation systems to reach sustainable development, social justice, inclusive planning, and resilience to climate change within the food systems space. Buchan et al. (2019) argues that local food systems planning "lacks a solid theoretical foundation to address how change processes in food systems occur" (p. 134). Through in-depth interviews, the study proposes a theory of "transformative incrementalism," arguing that food systems transformation happens through a long-term process of collaboration and change-making from various agri-food stakeholders and institutions.

An additional challenge facing FPEs is that there are no specific methods for creating food systems planning efforts. A 2015 analysis found that leaders of food systems initiatives "expressed how there were no clear models for them to follow when they began" (Shapiro et al., 2015). Similarly, MSU's Center for Regional Food Systems held a convening in 2021 for those involved with state-level FPEs and asked participants to respond directly to the question of whether their states' FPEs were worth the investment. Of the 14 state representatives the majority was in favor, while some expressed their concerns and hesitation.

The APA 2007 document "A Planners Guide to Community and Regional Food Planning" is one of many available resources to help planning professionals facilitate healthy eating in local and regional contexts and fill the gap in existing methodologies of FPEs. The survey found that "70% of respondents believed that the preparation and modification of comprehensive plans to include community and regional food issues should be an area in which the planning profession should be significantly involved" (Creswell and Creswell, 2017). The survey also identified the top barriers to the integration of food systems in urban planning efforts, which included lack of resources, lack of trained staff, lack of political support, and lack of organizational awareness (Deller et al., 2020).

Beyond the lack of well-defined theoretical framework and methodology in creating FPEs, further research has identified specific challenges, such as leadership and governance that inhibit creating and executing transformative food systems. Campbell (2005) explores that governance of food systems is difficult because of long-standing tensions between the broad and diverse range of stakeholders that shape these systems. Building from this, Slater et al. (2022) finds that these plans and initiatives generated relatively little truly transformative change due to an inability to tackle structural levers, such as power imbalances and political economy factors (see Wiskerke, 2009; Béné, 2022, Pereira et al., 2020). Raja et al. (2017) highlights the failure of mainstream planning to address issues of

equity and inclusion head-on. The article underscores three key failures in the current state of urban food systems planning: First, the failure to recognize historical injustices via planning processes; second, the functional absence of marginalized voices in the planning and design process; and finally, the failure to recognize that transforming the food system is in itself a lever for social change and equity, rather than a single facet of improving cities and communities (Raja et al., 2017).

Finally, in another study, Mui et al. (2021) explores the way in which FPEs have the potential to address these established dynamics and asymmetries. They assess adopted regional food systems plans in the United States, revealing a general lack of focus on equity, particularly with regards to food affordability and social equity along commodity chains. However, tactics that center on the improvement of food affordability and food systems governance while strengthening the implementation and monitoring of equity metrics were shown to help address these equity gaps within FPEs. Analyzing formal adoption and implementation of food system plans or charters in the US, it appears that comprehensive plans are more likely to be adopted by local, regional, and municipal governments, and that formal partnerships between planning and public health institutions produce stronger results through collaboration and capacity-building (Mui et al., 2018).

The need for a national community of practice of food system planning

Moving beyond the creation phase of food system plans and exploring assessment models used to evaluate impacts and outcomes similarly reveals either an absence of scientific monitoring of food system change, or a lack of agreed upon research methodologies for doing so. Freedgood et al. (2011) suggested that the planning field needs more research to assess the efficacy and impact of different food system assessment tools. Pierce-Quinonez (2016) examines this further, underscoring a lack of uniformity within the assessment process with regards to assessments' treatment of various factors of economic, social, and environmental sustainability.

At the national and international level, Fanzo et al. (2021) has called for the critical need for rigorous monitoring to guide food system transformation toward the 2030 SDGs, while Bene et al. (2024) has called specifically for the co-construction of participatory food system dashboards with local stakeholders as a key means to track and evaluate progress toward food system change goals.

An examination and assessment of collaborative planning processes reveal the complexity in cross-sectoral partnerships, along with a need to adopt clear methods in information sharing. Sonnino et al. (2019) explore the relationship between the theories and practice of an explicitly systemic approach to improving and shaping local food systems. They found that existing efforts focus heavily on the integration of food policy and the creation of inclusive and multi-stakeholder governance processes, however, they ultimately reveal low levels of engagement from local governments as well as key knowledge gaps (Sonnino et al., 2019). When exploring which frameworks help guide FPE's, Shapiro et al. (2015), and Harden et al. (2018) provides a national scan of state-level food systems transformation efforts in the United States that employ Kania and Kramer's (2013) Collective Impact frameworks in FPEs. These studies highlight the growing use of the Collective Impact Framework (CIF) created by Kania and Kramer in 2013, which argues that "large-scale social change comes from better cross-sector coordination rather than from the isolated intervention of individual organizations" (FAO, 2023). The CIF offers a set of five conditions for impact via network-building, which are: a common agenda; mutually reinforcing activities; continuous communication; a backbone support organization; and a shared measurement system for tracking progress (Kania and Kramer, 2013).

The UN sustainable development goals in food system planning efforts

Beyond the Collective Impact Framework, which may not be widely recognized across all stakeholders, expanding FPEs to incorporate globally recognized frameworks, such as the UN 2030 SDGs, may provide a unique solution to creating shared goals, indicators and metrics for the various social, health, economic, and environmental factors with which food systems have significant influence (Willett et al., 2019; Fanzo et al., 2021). Valentini et al. (2019) and Caron et al. (2018) both explore how food systems transformation is a precondition for achieving many of the UN SDGs, with the latter stating that it sits "at the nexus that links food security, nutrition, and human health, the viability of ecosystems, climate change, and social justice" (Freedgood et al., 2011). Similarly, Eakin et al. (2017) identifies the cross-dimensional components of achieving food systems sustainability, an idea backed by extensive research on the interconnectedness of the 17 SDGs (Pradhan et al., 2017; van et al., 2019; Obersteiner et al., 2016). Additionally, Herrero et al. (2020) and Hebinck et al. (2021) illustrate how food systems planning is holistic enough to address systemic change required to implement the UN SDGs.

Studies have argued that achievement of the SDGs at a global level requires multi-stakeholder partnerships (Masuda et al., 2022), and the inclusion of local governments as intermediaries for broader development. To the latter point, a 2022 report by Masuda et al. (2022) analyzed local Japanese government agencies and found that these local governments played effective intermediary roles toward the achievement of the SDGs by "articulating expectations and visions; building networks and managing resources; facilitating knowledge and learning processes; and supporting policy implementation and renewal" (10–11). This suggests that the incorporation of an internationally recognized framework may support the inclusion of multiple stakeholders as led by local governments, supporting Hoey's (2022) acknowledgement that FPEs are best institutionalized by capturing political attention, and building broader networks.

Conceptual framework of communities of practice

Efforts to empirically examine the process of forming a community of practice comes with a high degree complexities generated by the high degree of autonomy, and the dynamic interactions among organizational and institutional entities (Mohr and White, 2008; Li et al., 2009; Zougris, 2018). Addressing the procedural perplexities on developing a community of practice, we employ a generic approach of Bourdieusian perspective. Fields,

and practices (*praxis*) are two inseparable elements (Bourdieu, 1977, 1984): fields are social domains, in which groups of individuals (*agents*) with similar "cultivated dispositions" generate modes of action (Bourdieu, 1967, 1984; Wacquant, 2011; Walther and Walther, 2014). There is an inherent mechanism within any field where *agents* reach a conceptual consensus before they proceed to any type of *action* or *praxis*. Fields are shaped by routinized methods of operation (*consensual modus operandi*) performed by agents (individuals) (Bourdieu, 1990, 2018; Fligstein, 2001; Fuchs, 2003; Ennis, 1992).

Our conceptual framework of developing a national community of practice in food planning efforts entails the process of *participation*, and *reification* (Wenger, 1999, 2008). Participation is defined as the agents' effort and willingness to be directly involved and contribute to the negotiation process aiming to develop a consensual framework of planning and activities. Upon the completion of the negotiation stage, the stage of reification begins. Reification is the "process giving form to experience by producing objects that congeal this experience into thingness" (Wenger, 1999, 2008). Relying on Wenger's theoretical proposition, the process of reification aims to generate tangible forms of meaning on suggested collective practices that could shape the foundations of a community of practice grounded on the scope and functions already agreed in the negotiation process among the agents. The interplay between fields and practices informs the structural operational stages that should be considered in the process of developing a community of practice (see Figure 1).

Methods

To best address the purpose of our study, we employed a vanguard mixed-methods style known as exploratory sequential mixed-methods design (Creswell and Creswell, 2017; Creswell and Clark, 2017; Creswell, 2015; Nastasi and Hitchcock, 2015; Creswell et al., 2011; Tashakkori and Teddie, 2010; Clark et al., 2008). Specifically, exploratory sequential mixed methods design is suitable to detect and empirically explore the need for the development of a NCoP in FPEs aligned with the UN SDGs. Our methodological approach entails 2 distinct stages: (1) qualitative data collection, analysis exploring and detecting the components of the NCoP development; (2) quantitative survey design grounded on the findings of the qualitative data analysis. Upon the completion of the two stages a joint display of the findings and results are reported in the conclusions based on the integration of the qualitative and quantitative stages (Fetters et al., 2013; Figure 2).

Our data collection instruments (semi-structured in-depth focus interviews questionnaire and survey questionnaire) were designed to detect, and to explore the participants' perspectives on the need for NCoP in FPEs. Also, our mixed method design identifies the incentives for participation in the process of development and to assess their willingness to actively engage in an action plan of developing a NCoP. The semi-structured focus in-depth interview questionnaire was organized in the following sections: (1) Identification of Needs within the Food Planning Initiatives; (2) Organization/Initiative Community Engagement; (3) Awareness and Organizations'/Initiatives' Activities Aligned with theUN SDGs; (4) Willingness and Incentives to Participate in a NCoP of FPEs Linked to UN SDGs; (5) Closing Statements.

Finally, the construction of the self-administered online surveys derive from the emerging thematic entities as identified in the first stage of the exploratory sequential mixed methods design. We designed a series of questions assessing the respondents' attitudes on the need of developing a NCoP of planning efforts linked to SDGs, the respondents' willingness and/or likelihood to participate in the process of development and implementation of NCoP and the incentives that would increase likelihood of active engagement. The respondents were asked to complete 14-closed ended (i.e., Likert scale, contingency, matrix questions), and 5 open-ended questions. The survey questionnaire was organized in the following 4 sections: (1) Food Planning Organizations/Initiative Profiles; (2) Assessing the Needs for, and Willingness to Participate to NCoP development; (3) Awareness of alignment of FPEs with UN SDGs; (4) Respondents' Demographic Information.

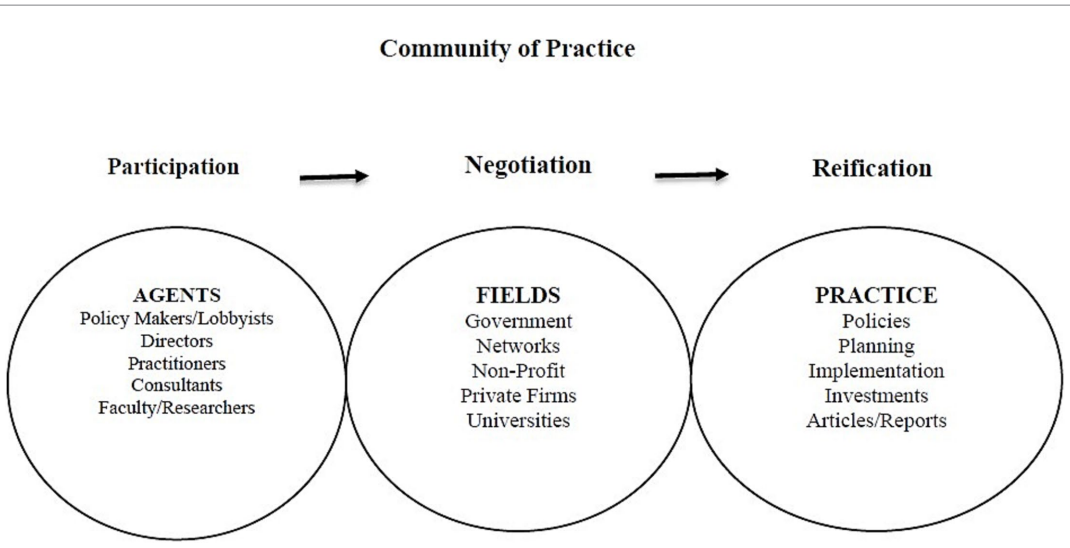

FIGURE 1
Conceptual domains: a pathway to NCoP development.

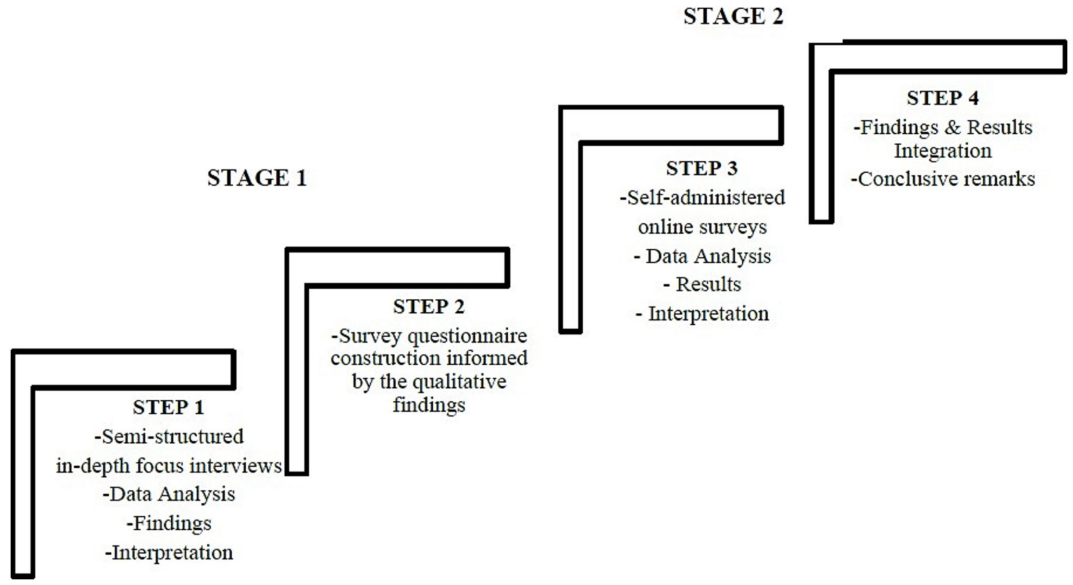

FIGURE 2
Exploratory sequential mixed-method approach.

STAGE 1: qualitative data collection and analysis

Sample

The selection of the key informants to participate in the semi-structured in-depth focus interviews was based on criterion-based purposive sampling design (Campbell et al., 2020). Our study did not aim to generalize the findings and results to the general population of food planning practitioners across the United States. Our purposive sampling design is grounded on a targeted selection of key informants based on predetermined criteria such as the depth of knowledge, experience, and leadership positions in ongoing food planning efforts (Patton, 2002; Cohen and Crabtree, 2006). We employed a two-stage purposive criterion sampling model; in the first stage, we developed a sampling frame relying on previous studies on detecting food planning networks at a national scale. We identified 39 distinct food planning initiatives across the United States that have begun since February 2023. The inclusion of the food planning efforts in the sampling frame was determined by the following criteria: (1) State and inter-State coverage (2) System-based and cross-sector plans (3) updated scope and mission of the plans beyond 2021; (4) employing participatory and collaborative development practices. The final frame selection was constituted by 25 distinct food planning efforts that met the criteria of inclusion, based on which, we identified key informants to participate in our study.

The inclusion of the food planning efforts in the sampling frame was determined by the following criteria[3]: (1) State and inter-State coverage (2) system-based and cross-sector plans (3) updated scope and mission of the plans beyond 2021; (4) employing participatory and collaborative development practices. The final frame was constituted by 25 distinct food planning efforts that met the criteria of inclusion, based on which, we identified key informants to participate in our study. The selection of key informants was based on the following criteria: (1) leadership positions in active food planning efforts; (2) highly cited scholars/researchers; and (3) professionals or practitioners that have been involved with two or more planning efforts. Figure 3 shows the final sample consisting of 25 participants with specific information regarding the type and origins of their organization and/or activities.

Data analysis

Upon the completion of the qualitative data collection, we transcribed the content of the semi-structured interviews and performed several steps such as data entry, data cleaning and data management followed by the execution of the data analysis procedure. The qualitative data management and analysis procedures were executed in NVivo. We employed the framework of thematic analysis techniques to analyze the qualitative data derived from the semi-structured focus in-depth interviews. Thematic analysis is a qualitative content analysis technique -widely used in social and behavioral science research-, that is purely descriptive and utilizes manifestations of meaning, as well contextualizes large corpora of textual data overlooking the semantic structure of the text (Mehl, 2006). It involves inductive coding based on which clusters of identifiable meanings form unidimensional categories or themes (Roberts, 2000; Popping, 2010). The ultimate function of thematic analysis is to identify systematic patterns and relationships between detected themes of textual content (Figgou and Pavlopoulos, 2015).

Similar to all qualitative data analysis techniques, thematic analysis may present issues with internal validity grounded on

3 The criteria for inclusion are based on the Michigan State University's (MSU) Center for Regional Food Systems, "Participatory State and Regional Food System Plan and Charters in the U.S.: A Summary of Trends and National Directory" (2021, p.3).

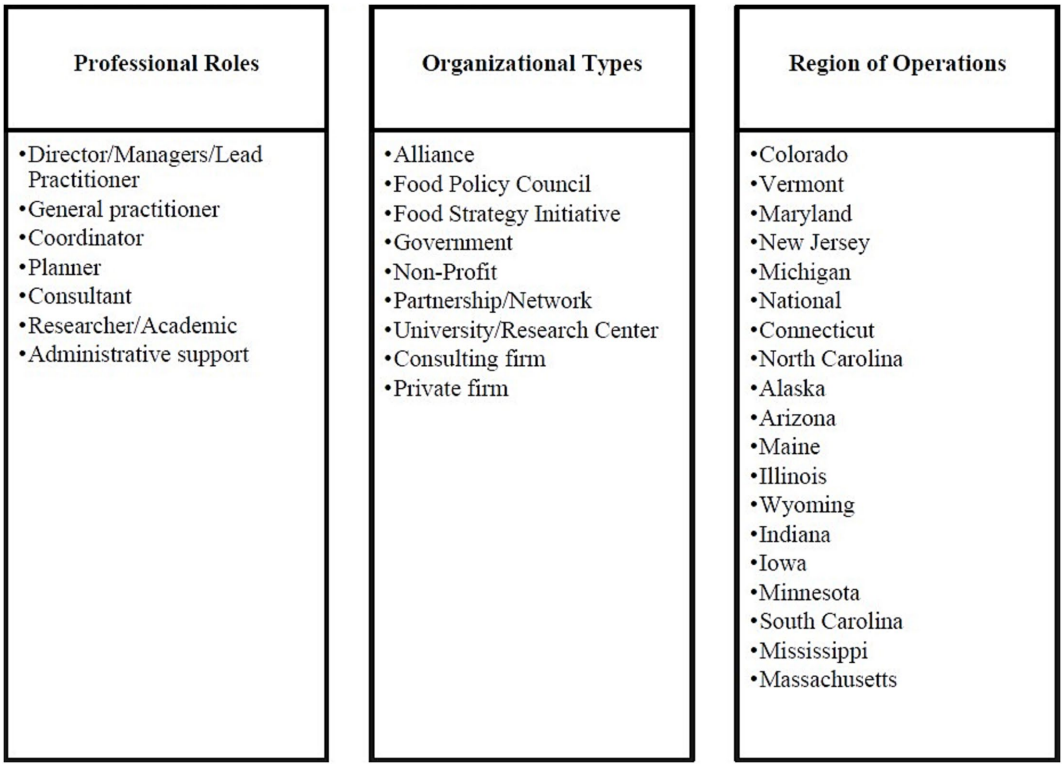

FIGURE 3
Participants sample characteristics.

researcher's bias in the process of developing coded categories (manifest and latent) and interpretation of data derived from the textual content. Considering the suitability, and recognizing the limitations of the technique, we implemented thematic analysis to shed light to underlying dimensions of meanings of the textual data produced from the interviews within the context of the needs, benefits, challenges, opportunities, risks, and best practices of developing NCoP.

Findings

Our analysis illuminated several themes within the five encoded contextual domains addressing the core research questions of our study. The first contextual domain consists of the identified needs of the food planning initiatives as identified by 25 lead practitioners and scholars of FPEs across 17 States. The participants identified seven (7) core needs that would significantly enhance the scope of food planning efforts/initiatives and improve their ongoing operations (see Figure 4). For instance, supplementary financial support was identified as the most essential need by most of the participants. Limited funding often sets barriers to the planning and implementation of food systems initiatives in the United States. Indicatively in this context a participant (P3) stated "*…the funding is a huge piece …*," while another (P7) claimed that "*…having state funding or something that is a little bit more ongoing and reliable is something that is a needed to develop a community of practice.*" Consequently, several participants conveyed that there is an emerging need for leadership positions, training opportunities, and recruitment of skilled personnel in their organization (participant 6:"*well, I would say, leadership first collaboration is definitely important. But you need somebody to keep pushing the thing forward.*" Further, participant 6 stated: "*you need to have that sense of input as a way of helping to create a sense of shared ownership*"). A third emerging theme of our analysis was associated with government support; participants expressed the necessity of stronger ties between the government and food planning and implementation efforts, particularly in the form of advocacy over the need for policy development and implementation across the States (P19:"We thought we could get the government to actually participate in food planning efforts").

Further, a fourth thematic domain emerged exemplifying the need of network expansion that would facilitate the process of sharing knowledge over the best implemented practices, as well as promoting inclusiveness via direct participation of community stakeholders in the planning and implementation stages of food systems initiatives. The themes of communication (equal access to information/resources), need for transparency (trust and credibility) and need for developing measures assessing the trajectory of food systems at scale (from planning to implementation and from implementation to societal impact), appear to be complementary to thematic space of the textual content derived from the semi-structured interviews. Moving on to detecting the thematic space within the context of awareness/familiarity and alignment with the SDGs, we detected that the majority about 80% of the participants' narratives indicated a high degree of familiarity with the sustainable development goals, while 20% claimed that they are not particularly aware of any of them.

The next step of analysis detected the overall interest in participating in the process of developing a NCoP linked to the SDGs.

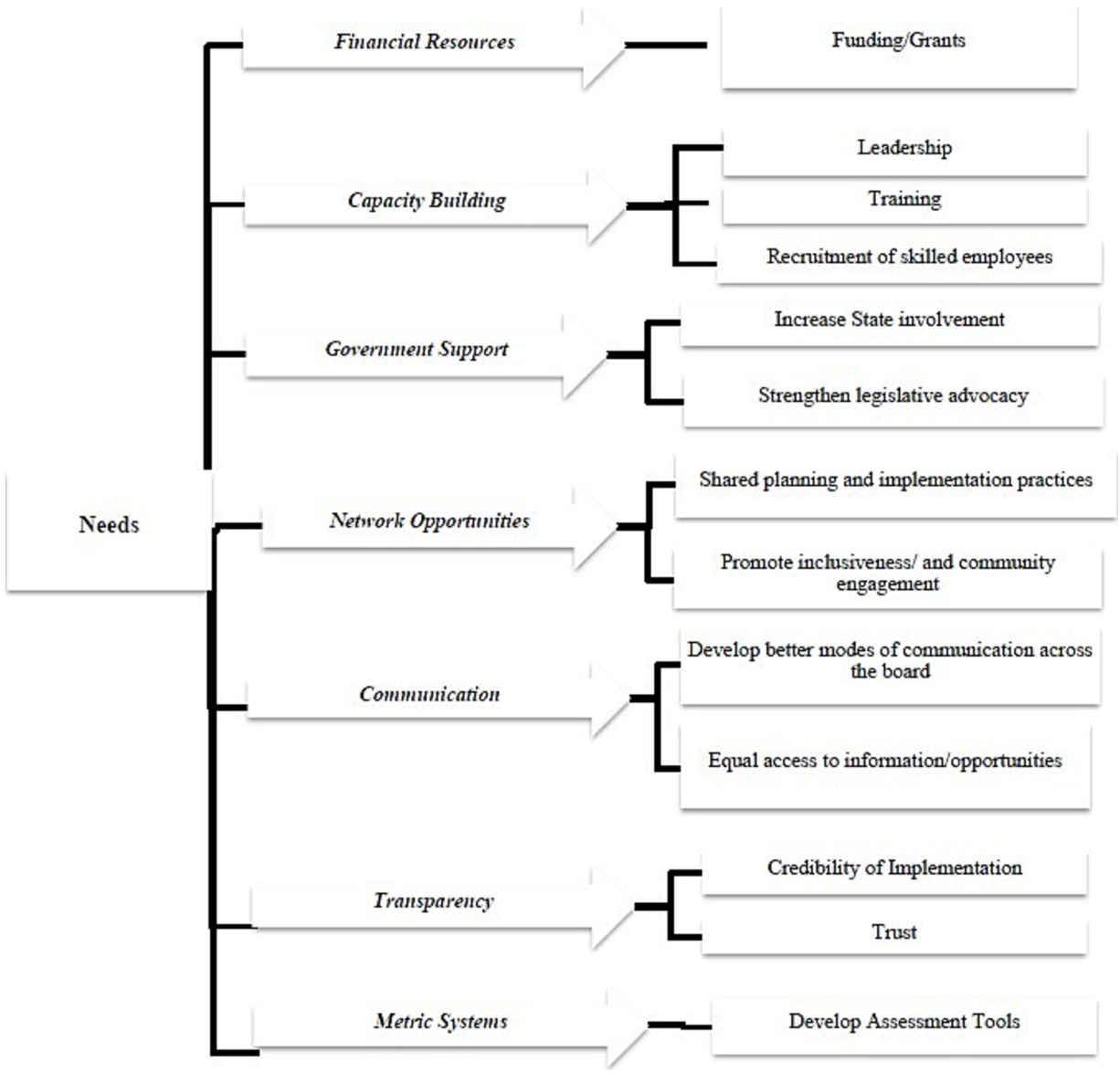

FIGURE 4
Identified needs in food planning efforts.

Five main interrelated themes emerged, highlighting the key criteria influencing participants' willingness to participate: (1) coordinated funding efforts; (2) trust and credibility; (3) opportunities for network expansion; and (4) shared knowledge (training); (5) equity/shared governance; and (6) collective efforts for policy transformation. Noticeably, our findings indicated that direct involvement in the planning process of NCoP appears more appealing than joining an NCoP in a later stage of implementation. Alternatively, the participants expressed their absolute hesitation to engage with the planning and/or development of a NCoP due to limited time availability and resources. At this point of our analysis, we detected a very interesting meta-analytic connection between the core needs (see Figure 3) and the incentives for participation in conjunction with the suggested functions of the NCoP linked to UN SDGs (see Figure 5). Most themes identified within the context of the core needs of the participants' organizations intersect with the ascribed incentives for participation in the process of developing a NCoP in FPEs. Simply, stakeholders' interest and willingness to engage with the development of an NCoP is aligned with the current needs of their organizations.

Furthermore, in regard to the foreseen challenges of the process of developing a NCoP the main themes can be outlined as follows: (1) competing priorities and conflicting interests of food planning efforts across the United States; (2) lack of funding to support the implementation of a community of practice at a national level, and compensate the ones involved; (3) absence of sincere commitment/engagement to the scope and mission of the NCoP. The majority of the participants expressed the notion that the benefits of NCoP functions outweigh the anticipated procedural challenges. Finally, most participants would be interested in a series of specific operations of the NCoP such as organizing conferences, convening meetings, reviewing food policy plans, writing grant proposals, and coordinating community activities.

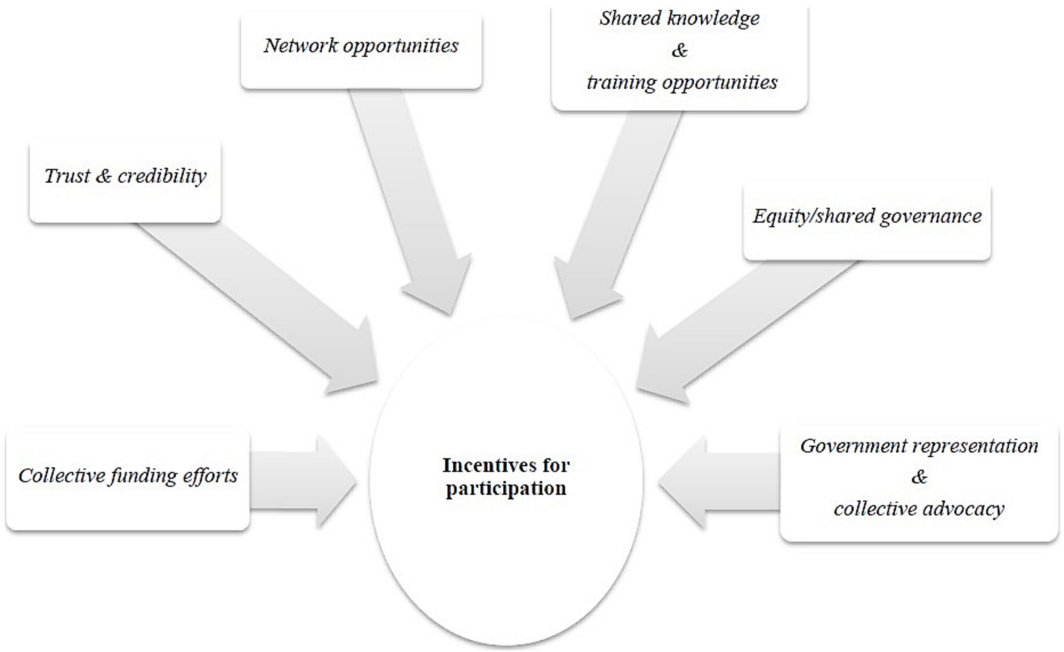

FIGURE 5
Incentives for participation and suggested core functions of NCoP.

STAGE 2: quantitative data collection and analysis

Sample

We employed a purposive sampling strategy to gather data from key respondents, yet the criteria for inclusion differ from the previous stage. We explicitly described the mechanics of the purposive criterion sampling in the previous section of this paper, yet another property of this technique is that despite its intrinsic bias, it maintains its robustness given the competence and reliability of the key respondents selected based on predetermined criteria serving best the purpose of a study (Tongco, 2008; Palinkas et al., 2015). However, due to the lack of exhaustive lists of all stakeholders of every single food planning effort at a national level, we supplemented the data gathering process with a snowball approach to increase the sample size. We asked the key respondents included in the qualitative stage of the data collection to share a web link of the survey questionnaire with other stakeholders involved in the same food planning initiative. This subtype of purposive criterion technique is a strategy where the respondents also play the role of recruiter/distributor of the questionnaire.

The final sample was constituted by 35 respondents who met one or more of the following criteria: (1) holding or having held any type of position in active, pending, inactive, retired or unknown food planning efforts; (2) any scholar who ever participated in food planning efforts, and (3) academics/researchers who published at least one manuscript in the field food planning efforts. The e-questionnaire was sent out from March 23rd to June 7, 2024. Our sampling frame consisted of 100 stakeholders, and practitioners of food policy councils, alliances, government agencies, non-profit organizations, partnerships, networks, universities, healthcare systems and funding entities. Our final sample size was formed by 35 respondents (response rate 35%; Figure 6).

Data analysis and results

Survey research is a widely used quantitative method involving standardized questionnaires to gather information from large groups of people and to systematically provide useful insights on attitudes, opinions, and behaviors in given contexts (Tanner, 2018; Odoh and Chinedum, 2014). The instrumentation of this type of research is primarily constituted by standardized questionnaires including primarily closed-ended questions. The systematic and standardized structure of survey designs reinforce the objective of replicability which is crucial characteristics of scientifically driven studies. Informed by the findings of the qualitative analysis that was performed in the previous stage of the exploratory mixed method sequential design -where we detected key themes in the context of the functions of a NCoP- we developed a survey questionnaire.

We conducted a basic univariate data analysis (see De Muth, 2019) of our survey data to assess respondents' attitudes on the need of developing a NCoP, the extent of their awareness on the UN-SDG and describe the level of interest in participating to specific functions and activities of a NCoP. The results of our descriptive analysis indicated an overwhelming positive attitude on the need and willingness to engage in the process of developing a community of practice on a national scale, and a relatively high level of familiarity with the UN SDGs. Specifically on a scale of 1 to 10, the average ratings for the needs and willingness for participation appear to be above 8 out 10, while the average score of respondents' familiarity with the UN SDGs is approximately 7.5 (see Table 1).

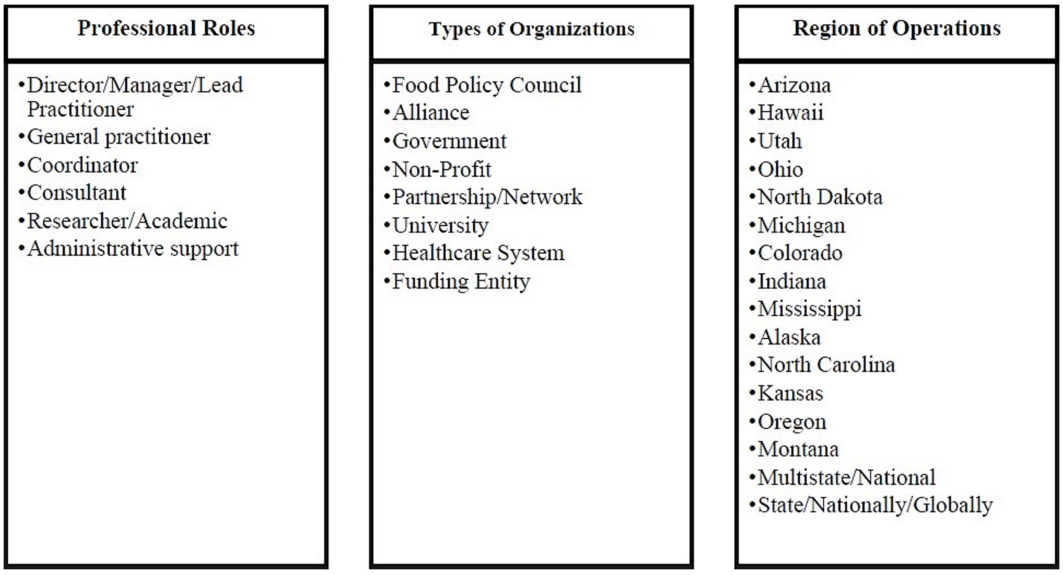

FIGURE 6
Respondents sample characteristics.

TABLE 1 Ratings on the need for a NCoP, likelihood of participation and familiarity with SDGs.

	Minimum	Maximum	Mean	Std Deviation
Need for developing a NCoP	5.00	10.00	8.39	1.47
Likelihood to participate in a NCoP	2.00	10.00	8.08	2.32
Familiarity with UN SDGs	2.00	10.00	7.52	2.50

In the next step of our analysis, we inquired whether the respondents' organizations alignment (formally or informally) with any of the UN SDGs. It appears that 71.4% of the respondents identified that their organization aims to achieve food security and sustainable agriculture (SDG #2) while more than half of reported that their organizations aim to strengthen the means for partnerships for sustainable development, ensure healthy lives, sustainable consumption and production patterns(SDG # 3 and SDG # 12). A significant portion of the respondents indicated that it is within the aim of the organization to promote sustained inclusive and sustainable economic growth (SDG # 8), as well as make cities and human settlements inclusive, safe and resilient (SDG # 11). Table 2 lists the percentage distribution of organizations performing activities that are equivalent to the UN SDGs.

The final step of our descriptive analysis assessed the level of interest in various types of proposed functions and activities[4] of a NCoP. Figure 7 illustrates the percentage distribution of respondents that are willing to contribute to a series of activities tasks. Our results revealed that the vast majority of the respondents (96%) appear to be either very interested or interested in being involved in operations associated with lessons learned, while 92% of them are particularly interested in participating in sharing documents and strategies, 88% in peer-coaching and co-learning activities, 73% in seminar/webinar development, 72% in workshop development, 64% in conference organization, and 56% in collaborative fundraising and food policy reviews. Less than half of the respondents appear to be interested in being involved in teleconferences and editorial work for NCoP newsletters.

Discussion

Upon the completion of our analysis in both stages of our exploratory sequential mixed-method design, the integration of qualitative findings and survey results coincide with the findings of the scientific literature on food system planning and implementation. Our findings explicitly reaffirmed the need for stronger advocacy, capacity building and coordinated activities as a practice against the lack of intensified voices within the formal government structures (Kania and Kramer, 2013). Besides the identified needs, our analysis shed light to a series of structural challenges such as disproportionateness of funding resources, absenteeism of shared governance, limited educational and training opportunities, lack of transparency in decision making processes, trust and credibility concerns, and asymmetric assessment methodologies. Our results support Raja et al. (2017) claims about systemic failures to recognize that food system transformation is in itself a lever for social change and equity, rather than a single side of improving cities and communities. Within the context of perceived challenges, our findings indicate potential systemic fallacies and structural inefficiencies in the national domain of food planning efforts. Specifically, there is a general concern that the existing

4 The list of functions and activities were generated by the thematic analysis in the first stage of our research design.

TABLE 2 Frequency distribution of organizations aligned with the SDGs.

SDGs	Description	%	Count
SDG#2	Achieve food security and sustainable agriculture.	71.4%	25
SDG#17	Strengthen the means for partnerships for sustainable development.	54.3%	19
SDG#3	Ensure healthy lives and promote well-being for all at all ages.	51.4%	18
SDG#12	Ensure sustainable consumption and production patterns.	51.4%	18
SDG#8	Promote sustained, inclusive, and sustainable economic growth.	48.6%	17
SDG#11	Make cities and human settlements inclusive, safe, resilient, and sustainable.	42.9%	15
SDG#13	Take urgent action to combat climate change and its impacts.	40.0%	14
SDG#4	Ensure inclusive and equitable quality education/learning opportunities.	34.3%	12
SDG#16	Promote peaceful and inclusive societies for sustainable development.	34.3%	12
SDG#10	Reduce inequality at regional levels.	31.4%	11
SDG#6	Ensure availability and sustainable management of water and sanitation.	28.6%	10
SDG#1	Reduce or eliminate poverty.	25.7%	9
SDG#14	Conserve and sustainably use the oceans, seas, and marine resources.	25.7%	9
SDG#15	Protect and promote sustainable use of terrestrial ecosystems, forests.	25.7%	9
SDG#9	Promote resilient and inclusive sustainable industrialization/innovation	20.0%	7
SDG#5	Achieve gender equality and empower all women and girls.	14.3%	5
SDG#7	Ensure access to affordable, reliable, sustainable, and modern energy for all.	14.3%	5

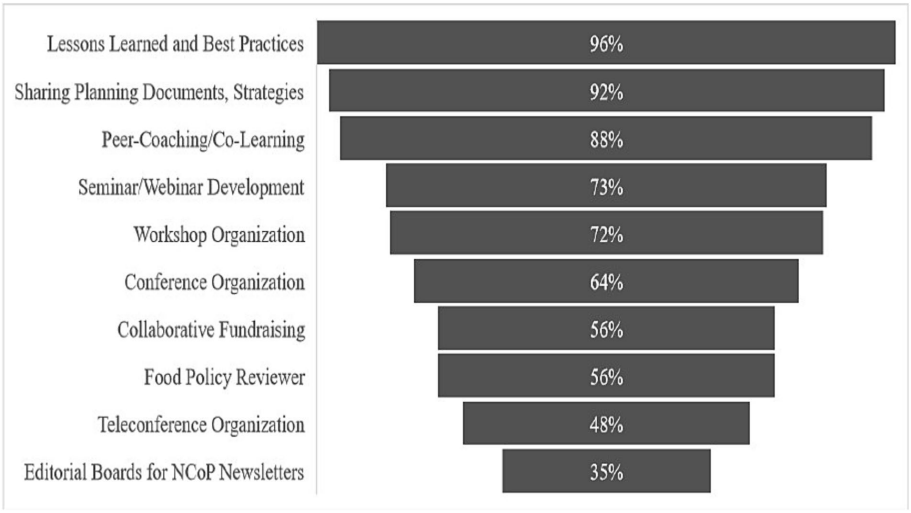

FIGURE 7
Distribution of respondents' interest in participation in NCoP activities.

operations in FPEs at regional and national scales are fractured by the contested practices delimiting inclusiveness across the board. Rivalries, and conflicting interests across FPEs shall be remedied by the process of open participation, transparent negotiation, and reification of collaborative operations. Informed by our general theoretical framework that describes the process of developing communities of practice (see Wenger, 1998), we detected that the majority of stakeholders are interested in taking part in the process of developing a NCoP aligned with the UN SDGs. On that note, most stakeholders, regardless of their sectorial activities, are familiar, yet their FPEs are not formally aligned with the UN SDGs. Interestingly, we observed cases where the mission and activities of various food planning efforts portray the fundamental objectives of sustainable development, yet no effort has been made to formally associate with the United Nations framework of sustainable development. Such a finding supports the fact that despite the extensive focus on inclusive and multi-stakeholder governance processes, there are key knowledge gaps restricting the opportunities to expand the networks of shared practices at scale (Sonnino et al., 2019).

Another key finding of our integrative analysis shows that stakeholders with a variety of professional positions across organizations expressed their preference to take the lead in specific tasks of shared

knowledge and lessons learned. Such a finding also reinforces the importance of the process of negotiation based on which an agreed-upon conceptual framework would initiate the operational functions of the community of practice. The majority of respondents are particularly interested in capacity building, evaluation of existing plans, as well as participation in workshops, conferences, and informal meetings. Further, implementing collaborative fundraising activities, conducting policy reviews, and coordinating community engagement activities emerge as highly preferred activities to engage with NCoP. Both academics and practitioners recognized the need for extended research and development of consistent measures of sustainable development at scale (local, state, national and international). The results of our analysis reiterated previous research claims over the need to promote uniformity of metrics of economic, social, and environmental sustainability (Pierce-Quinonez, 2016; Freedgood et al., 2011). Future research should focus on the *modus operandi* of incorporating the UN SDGs into a NCoP of FPEs informed by the measurements of accessibility to healthful foods and programmatic efforts to improve food environments at the national level (Eating, 2008). On this note, we classified key considerations and highly rated priorities in conjunction with the recommended action plan as identified by the participants of our study. To begin with, an emerging theme focuses on the hierarchical structure of preliminary activities informed by a sequence of participation, negotiation, and reification. That is, a group of researchers, practitioners and stakeholders in the field must actively participate in the process of identifying the full spectrum of food system planning efforts and activities across the nation. Subsequently, stakeholders should be involved in the process of formulating a comprehensive set of core values and objectives relevant to their existing food planning efforts and initiatives. Further, it is advised that the process of negotiation shall occur in a series of informal meetings and large-scale conferences that will take place to define common agreements and polarizing views about the core functions and objectives of the NCoP aligned with the UN SDGs. Data driven conceptual maps would render the consensual core values and agreed-upon objectives that will constitute the initial statute of the NCoP. The framework of participation, negotiation and reification should be iterated, establishing trust, credibility and shared responsibility for all actors and organizations involved throughout all developmental stages of the formation of a NCoP aligned with the UN SDGs at a local scale (Moallemi et al., 2020).

Limitations

Our analysis comes with several limitations that will be addressed in this section. First, our research design did not aim to provide a generalizable findings and results representing the population of Food System practitioners in the United States. The use of the non-probability sampling (purposive or judgmental) was selected given that the scope of our study was never meant to generate results that would be representative and generalizable to the entire population of food system experts, scholars and practitioners. We recognize that a random sampling technique with a significantly larger sample size would have generated robust data suitable for advanced inferential models that would have enhanced our analysis and the interpretive power of the results. Finally, due to the limitations of cross-sectional analysis (data collected at one-point of time), future studies should employ a longitudinal design assessing to identify the patterns over the needs and challenges of developing a NCoP aligned with the UN SDGs.

Conclusion

Based on the findings of our mixed-method sequential methodological design, we conclude that there is both a need and much potential for the development of a NCoP among diverse stakeholders, including policymakers, researchers, community-based organizations, and practitioners involved in FPEs. Our analysis indicates that the formation of an NCoP can lead to the sharing of best practices and planning documents, innovative approaches to planning, implementation and monitoring, collective fundraising and advocacy, peer-coaching and the exchange of successful models that can be replicated or adapted in different contexts, thereby accelerating and scaling the impact. Inarguably, food systems are complex and multifaceted socio-ecological entities involving various sectors such as agriculture, distribution, consumption, and waste disposal with profound influence on public health, culture, society, economics, and the environment. We argue that well-designed and coordinated NCoP can help address the interconnected challenges facing FPE more effectively than isolated planning initiatives. A unified NCoP can provide a collective voice to influence policy decisions, secure funding, and promote practices that might be challenging for individual planning entities to achieve alone. A NCoP can offer training, resources, and technical assistance to build the capacity of local and regional food system planners, and to enhance the skills and knowledge base across the country. Additionally, developing standardized indicators, metrics and evaluation tools can help in assessing the impact of food system planning and implementation efforts, thereby ensuring transparency and more consistent and comparable data across different regions. Furthermore, coordinated activities can contribute to building shared strategies helping communities better prepare, withstand, and recover from shocks and disruptions to agri-food systems. A NCoP can prioritize equity and inclusion, ensuring that marginalized and underrepresented groups are actively involved in food system planning and address the needs of all community members. Further, collaboration among academic research institutions, legislators and FPEs within the community can spur adaptation, innovation, and integration in food system planning, policy, implementation, and monitoring. Finally, pooling resources and aligning efforts can lead to more efficient use and allocation of funds, ensuring that investments are directed toward the most impactful practices aligned with state and regional food system initiatives and planning efforts. Future studies in this line of research should focus on the generation of large-scale data by employing probability sampling techniques with adequate sample sizes to further analyze the factors and covariates contributing to a NCoP in FPEs aligned with the UN SDGs.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

KZ: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. AM: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. RB: Conceptualization, Data curation, Investigation, Software, Writing – original draft. EG: Conceptualization, Data curation, Investigation, Software, Writing – original draft.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. This work was supported by the Inter-Institutional Network for Food, Agriculture, and Sustainability (INFAS). The findings and conclusions in this publication are those of the authors and do not necessarily reflect the views of INFAS.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

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