

cambridge.org/raf

Nikki Nadeau¹  and Elizabeth A. Koebele² ¹School of Environment and Natural Resources, The Ohio State University, Columbus, OH 43210, USA and²Department of Political Science, University of Nevada, Reno, NV 89557, USA

Research Paper

Cite this article: Nadeau N, Koebele EA (2023). Collaborating to reduce food waste: building collaborative advantage in local food systems. *Renewable Agriculture and Food Systems* **38**, e32, 1–10. <https://doi.org/10.1017/S1742170523000285>

Received: 30 January 2023

Revised: 25 April 2023

Accepted: 27 May 2023

Keywords:

collaborative advantage; collaborative governance; food policy councils; food waste

Corresponding author:

Elizabeth A. Koebele;

Email: ekoebele@unr.edu**Abstract**

Food loss and waste throughout the food supply chain is a growing issue with significant economic, social and environmental implications. Wasted food represents lost profits for the food industry, increased food insecurity in communities and the unnecessary production of greenhouse gas emissions, among many other detrimental consequences. Due to the large number of stakeholders involved in the food supply chain and the complexity of their relationships, there is increasing interest in addressing food waste issues through collaborative governance approaches, such as food policy councils (FPCs). Assessing how FPCs engage diverse stakeholders and organizations in food waste reduction efforts can provide important lessons for improving local food systems governance more broadly and contribute to the creation of more sustainable food systems. To do this, we leverage the theoretical concept of ‘collaborative advantage’ to analyze how FPCs foster collaboration, both internally and with external partners, to achieve policy and programmatic goals that individual stakeholders could not achieve alone. Drawing on plan documents and semi-structured interviews with members of five FPCs across the USA, we find that FPCs can foster collaborative advantage by establishing comprehensive food system plans, systematically measuring progress toward objectives, and transparently communicating the evidence of their progress to the communities they serve.

Introduction

Food waste is a problem with wide-ranging social, environmental and economic impacts (Hall *et al.*, 2009; Barrera and Hertel, 2021). When measured by weight, roughly one-third of all food produced globally is wasted throughout the food supply chain, with that figure increasing to 40% in developed nations (Gustavsson *et al.*, 2011). Moreover, 22% of global freshwater withdrawals and 14.9% of farmable land are dedicated to growing food that goes uneaten (Poore and Nemecek, 2018). Simultaneously, 10.8% of the global population, or about 821.6 million people, are undernourished (FAO, 2019). These trends will likely be exacerbated by the disparate impacts of climate change and continued population growth, making food waste a particularly grave injustice. Reducing food waste can therefore play a critical role in enhancing environmental and social sustainability and public health across the globe in the years to come (Anderson *et al.*, 2020). Achieving this is challenging, however, due both to the large number of stakeholders involved throughout the food supply chain and in food-adjacent sectors (e.g., healthcare, government, etc.) that must be included in food waste reduction efforts, as well as the many steps at which resources are wasted (Cattaneo *et al.*, 2021).

While several national governments have begun to implement top-down strategies related to food waste reduction and food governance broadly, scholars and government agencies alike increasingly highlight the need for more collaborative and integrated approaches to solve these complex problems (Halloran *et al.*, 2014; Aschemann-Weitzel *et al.*, 2017; de Mores *et al.*, 2020). Food policy councils (FPCs) have emerged as one type of mechanism to realize collaborative approaches to food systems governance, including food waste reduction (Schiff, 2008; Siddiki *et al.*, 2015). Exemplary of a global trend toward collaborative environmental governance, FPCs are groups of diverse stakeholders who work together to address food-related issues in their communities (Harper *et al.*, 2009). While FPC members may engage in direct food waste reduction efforts, much of their work involves connecting with and coordinating among various partner organizations in their community, including those directly related to food industry interests, such as farms and food banks, and those outside of the food industry, such as government agencies and schools (Gupta *et al.*, 2018). Understanding how FPCs structure their own efforts and leverage partnerships with external groups to achieve successful collaboration can provide actionable insight into the development of effective food waste reduction efforts, as well as recommendations for designing better food systems governance institutions.

© The Author(s), 2023. Published by Cambridge University Press. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

In this study, we investigate how FPCs foster collaboration in their local food systems to reduce food waste through the lens of a theoretical concept called *collaborative advantage*. In contrast to building a ‘competitive advantage’ over other organizations, collaborative advantage describes the outcomes of interorganizational collaboration that enable organizations to achieve things together that they could not alone (Huxham and Macdonald, 1992). In the ‘Theory’ section, we further discuss the complexity of governing food systems, the need for enhanced collaboration to address issues such as food waste, and the concept of collaborative advantage. In the ‘Research design and methodology’ section, we describe the research design used to gather data on the activities of FPCs with food waste reduction goals in the USA. Drawing on policy documents and in-depth interviews with members of five FPCs, we assess (1) whether and how FPCs are structured to build collaborative advantage, and (2) evidence for collaborative advantage in practice through FPC partnerships (‘Results and discussion’ section). From our findings, we glean lessons for how FPCs and similar groups can build collaborative advantage to improve local food systems broadly (‘Conclusion and recommendations’ section).

Theory

Governing complex food systems

Food systems are highly complex in that they are composed of many actors, including producers, governing entities, distributors, consumers and others who intersect with the food system along the way, from industry groups to healthcare providers. These actors often have diverse priorities and varying levels of resources, authority and relative autonomy in their actions. However, there is also a critical element of interdependency among these actors, particularly because food systems involve the utilization of shared natural resources. For instance, growing food requires immense inputs of land, energy and water, and the outputs are critical to survival and well-being for all. Reducing food waste thus necessitates a collaborative approach wherein diverse actors work together to achieve common goals (HLPE, 2014).

One way to improve governing performance in complex systems is through the use of collaborative governance (CG). CG is an approach to creating and implementing public policy that engages diverse stakeholders in consensus-oriented decision-making processes, often under the guidance of a government agency or office (Ansell and Gash, 2008; Emerson and Nabatchi, 2015). While CG processes use a variety of structures and decision rules, they generally incentivize stakeholders to deliberate about their values, beliefs and preferred solutions, with the goals of building trust, enhancing learning and ultimately locating opportunities for mutually beneficial action (Koebele, 2020). CG is also a particularly well-suited approach for governing problems that span traditional political or administrative jurisdictions as well as physical boundaries (Guerrero *et al.*, 2015). As such, CG can help actors coordinate across different policy-making forums to improve overall system governance (Lubell, 2015).

This is a somewhat rosy view of the potential of CG to solve coordination problems in complex systems, however, since they are often fraught with inertia and suffer from a lack of leadership and resources. Indeed, CG can be time- and resource-intensive and may become mired in conflict or generate ‘lowest-common-denominator’ solutions (Koebele, 2020). Moreover, the outcomes

of CG are often incremental (Huxham, 1996a), making it difficult to measure and attribute social or environmental changes to specific collaborative efforts (Koontz and Thomas, 2006). As such, it is often necessary for the leaders of a collaborative process to cultivate ‘shared motivation’ in order to achieve ‘capacity for joint action’ to promote genuine and effective collaboration (Emerson and Nabatchi, 2015; Kossmann *et al.*, 2016). In short, organizations must surmount various barriers to achieve something collaboratively that provides greater benefits to all—a concept known as collaborative advantage.

Building collaborative advantage

The term collaborative advantage, introduced by Huxham and Macdonald (1992), suggests that through effective interorganizational collaboration, organizations can achieve things together that they would not be able to alone (Huxham and Macdonald, 1992; Emerson and Nabatchi, 2015). This can be contrasted with ‘competitive advantage’, from the organizational strategy literature, wherein organizations seek to cultivate some unique characteristic(s) in order to cope with and prevail over competitive market forces (Porter, 1985). In the theory of collaborative advantage (TCA), ‘the *advantage* need not, of necessity, be an advantage over other organizations; it may simply be an advantage over the situation which would pertain if there were no collaboration’ (Huxham and Macdonald, 1992, p. 51; emphasis in original). In other words, when parties to the collaboration think constructively and strategically about how they may work together, there is the potential for net benefit to all.

To build collaborative advantage, Huxham and Macdonald (1992) first suggest developing and implementing a *meta-strategy*—or an agreed-upon set of rules and procedures under which all participants operate within a collaborative arrangement. A meta-strategy outlines which responsibilities belong to the collaborative group’s members and which belong to individual organizations with whom the group interacts. It also details the group’s goals and proposes ways to achieve them. Clearly articulating the structure and rules of collaboration through a meta-strategy can help members better achieve individual and collective goals by identifying avenues for coordination (Huntjens *et al.*, 2012; Pahl-Wostl and Knieper, 2014; Sullivan *et al.*, 2019).

Collaborative advantage is unlikely to be built if the meta-strategy is not actually followed by members of the CG process, however. Indeed, the ‘rules-in-use’, or how rules are followed in practice, also impact the group’s ability to build collaborative advantage (Ostrom, 2005). Thus, Huxham and Macdonald (1992) also suggest that there must be a way of *monitoring* the activities of the collaborative to ensure that they align with the agreed-upon ‘rules-in-form’ (Ostrom, 2005). Monitoring is expected to work most effectively when it is performed by individuals that are either separate from, or includes all of, the collaborating organizations to prevent the perception that the monitoring favors or disadvantages any party (Huxham and Macdonald, 1992). In either case, the monitoring mechanism should be developed with input from the individuals being monitored in order to increase trust, transparency and ideally, compliance (Ostrom *et al.*, 1961; Ostrom, 1990). Similar to the meta-strategy, both the rules for and practice of monitoring can impact a group’s ability to build collaborative advantage and achieve desired outcomes.

While the TCA literature suggests ways to build collaborative advantage, the concept itself remains understudied empirically

and is largely absent from use in the food policy domain (Kiminami, 2016). The bulk of the literature on TCA exists in the business management literature and is aimed at private industry actors (Huxham and Macdonald, 1992; Huxham, 1996b; Huxham and Vangen, 2013); however, TCA provides guidance for answering questions that arise in CG arrangements across issues and sectors. Whether a stakeholder or group belongs to private industry, a public regulatory body or a non-governmental organization, they often face challenges to building trust, maintaining accountability and building legitimacy in a collaboration (Ansell and Gash, 2008; Emerson and Nabatchi, 2015; Cristofoli *et al.*, 2021). In this vein, Huxham and Vangen (2013) have written of the potential value of TCA across contexts, so long as it is interpreted and applied appropriately. We thus argue that TCA is a useful conceptual tool for informing and evaluating how actors collaborate to solve problems in local food systems. Specifically, it provides a simple and practicable framework based on two primary components (i.e., meta-strategy and monitoring) that help stakeholders navigate CG processes to increase their likelihood of producing mutually beneficial outcomes. Applying TCA empirically, however, requires a closer look at existing CG efforts in the food policy domain.

Collaboration in the food policy domain: food policy councils

As introduced above, there is a need for increased collaboration to solve a variety of complex problems in the food policy domain (Halloran *et al.*, 2014; Aschemann-Weitzel *et al.*, 2017; de Mores *et al.*, 2020). Since the 1980s, FPCs have emerged as a type of CG arrangement across North America, Europe and Australasia that facilitates collaboration among diverse public and private stakeholders within complex food systems (Schiff, 2008; Siddiki *et al.*, 2015). FPCs (1) serve as forums for discussing food systems issues, (2) coordinate activities across sectors, (3) evaluate and effect policy change and (4) implement and/or facilitate programs to address local food system problems (Harper *et al.*, 2009). In short, FPCs serve as collaboration-oriented venues through which information is shared, problems are defined, solutions are considered and resources are pooled to implement programs and recommend policy changes.

While many FPCs share common, overarching goals (e.g., creating environmentally and socially sustainable food systems), individual FPCs have unique structures, rules and priorities, which are often dictated by their membership and local context. For instance, some FPCs seek to support the economic success of farmers and other food-related businesses, while others focus on increasing food security or reducing food waste (Scherb *et al.*, 2012). The diversity of FPCs is reflected in the variety of names they are given, including ‘food and farm councils’, ‘food systems committees’ or, more simply, ‘food councils’ or ‘food policy groups’ (FPN, 2020). However, because these groups are most commonly identified in the literature as ‘food policy councils’, we maintain this terminology.

FPCs may be classified as various types of organizations, such as (1) embedded in a non-profit; (2) embedded in a university, such as through a cooperative extension program; (3) embedded in government; (4) an independent grassroots organization or (5) an independent non-profit (CLF, 2019). A key distinction between these organizational structures is their relationship to government (Schiff, 2008). FPCs embedded in government agencies, which are often created by a government mandate, are generally expected to focus on recommending and enacting policy on

topics dictated within their mandates (Schiff, 2008; Ambrose *et al.*, 2022). Conversely, those that emerge organically from community interest or maintain less direct governmental connections may emphasize on-the-ground implementation of programs or advocacy for policies developed by others (Schiff, 2008). Additionally, the nature of the relationship between an FPC and the government may have implications for the group’s access to resources. For example, an FPC that is initiated and directed by a local governing body may have a full-time paid staff member dedicated to advancing the FPC’s mission, whereas grassroots FPCs tend to be exclusively run by volunteers with less capacity.

Collaboration among FPC members as well as partnerships between FPC members and community organizations are both foundational to an FPC’s ability to achieve its goals. We differentiate FPC members from partners on the basis of the longevity and formality of one’s relationships with the FPC. *Membership* entails an organization or individual committing to consistent involvement in FPC administration and governance activities, potentially for a specified period of time or in an official position. *Partnership*, in contrast, can be defined as a relationship between FPC members and ‘external’ individuals or organizations that are not formal members of the council, developed with the intent of achieving shared food systems-related goals. According to Clayton *et al.* (2015), different types of partnerships may provide different benefits to the FPC. For instance, partnerships with government officials may offer visibility and legitimacy to an FPC’s policy work by raising awareness of food systems issues among decision makers. Other partnerships may help steer an FPC’s programmatic agenda, provide access to key resources and garner broader stakeholder buy-in. While such roles have been well articulated, little empirical evidence exists about how FPCs structure and leverage external partnerships to achieve their goals. Moreover, there is scant literature (Clayton *et al.*, 2015) regarding the ways in which an FPC’s external partners contribute to or benefit from collaborating with the FPC—or, in other words, how they contribute to building collaborative advantage. The next section describes our empirical approach to addressing these gaps.

Research design and methodology

Research questions

As FPCs grow in popularity across the globe, it is necessary to understand how they can maximize achievement of positive food systems outcomes through collaboration. As such, the overarching research question of this study is as follows: *How do FPCs build collaborative advantage in their local food system?* Our analysis is guided by the following sub-questions:

- RQ1a: To what extent are FPCs structured in line with the key tenets of collaborative advantage (i.e., meta-strategies and monitoring mechanisms)?
- RQ1b: What evidence exists for the development of collaborative advantage by FPCs via their partnership activities?

Critically, we narrow the scope of our empirical inquiry to FPC activities pertaining to food waste reduction in order to enhance specificity and comparability across FPCs. Although it is beyond the scope and intent of this study to estimate actual reductions in food waste as a result of FPC activities, we analyze how FPCs structure and leverage partnerships in service of reducing food waste. As described above, reducing food waste inherently

requires broad collaboration across sectors and may be more obviously improved in food systems with greater collaborative advantage. However, we expect our findings to be generalizable to other related FPC priorities, such as increasing community food security.

Research design and case selection

To answer our research questions, we conducted an exploratory case study (Yin, 2009) of five FPCs in the USA with food waste reduction goals. To understand the current landscape of FPCs in the USA and select FPCs to analyze, we utilized the Johns Hopkins Center for a Livable Future (CLF) Food Policy Networks dataset, which was made available to the authors upon request (CLF, 2019). This dataset reflects the results of an annual survey of FPCs in the USA and Canada conducted by the CLF. In 2019, the year of the most recent complete dataset at the time of this study, the CLF collected responses from 241 FPCs. We selected FPCs from this dataset to study in depth in order to understand their structure, internal dynamics and external relationships. Given that our study was limited to FPCs with food waste reduction goals, we used the following steps to narrow our list of potential FPCs from the CLF dataset:

- (1) Food waste must be listed as a top-three priority ($n = 54/241$).
- (2) FPC must have active status (i.e., met at least once in the past year).
- (3) FPC has a member focused specifically on food waste reduction.
- (4) FPC must be in the USA.
- (5) FPC must have contact information in the CLF database.

We found that 27 FPCs met all criteria for inclusion. To further narrow our cases for in-depth analysis, we examined the organizational type of each of the 27 councils. We then contacted all of the FPCs in the two most common organizational types in the FPC dataset—those housed in a non-profit (8/27) or embedded in government (6/27)—to request participation in the study, a selection criteria which enhances the generalizability of our results.

The FPCs ultimately included in the study ($n = 5$; Table 1) are those who (1) consented to participate, and (2) could connect us

with a chair of the FPC *and* an FPC member focused on food waste, as will be described in more detail below. The five included councils were established between 2006 and 2018, and are located in Kansas, North Carolina, Pennsylvania, Rhode Island and Wisconsin. They are not identified by name to protect interviewee confidentiality. Data on each FPC were collected in two ways, as described in the following sections.

Document data collection and analysis

First, we collected and analyzed written formal documents for each selected FPCs, including the FPC's mission and goal statements listed on their websites, as well as any food system plans they had created and made publicly available. A food system plan is a collaboratively developed document that details the goals of the FPC and other participating entities (e.g., city or county governments) and how these goals are meant to be attained. We analyzed these documents to (1) gather background information on each council, and (2) to assess the relative extent to which they articulated attributes align with the two key tenets of collaborative advantage: meta-strategy and monitoring (RQ1a). Drawing on Huxham and Macdonald (1992), we assessed two attributes of meta-strategy for each FPC as they were articulated in the FPC's documents: (1) the presence and specificity of a mission or goals statement, and (2) the presence and level of detail of a food system plan. We also assessed two attributes of monitoring: (1) the frequency of meetings, and (2) the articulation of strategies for tracking/publishing progress toward goals. We assume that the presence and strength of these attributes in FPC documents is related to, but not wholly indicative of, an FPC's ability to build collaborative advantage.

We compared the document-derived data on the tenets collaborative advantage across FPCs using a method similar to qualitative comparative analysis (QCA), which aims to provide in-depth insight into the mechanisms driving outcomes in particular cases while enabling some level of generalization in a medium- n sample (Ragin, 1987; Byrne and Ragin, 2009). Akin to the 'fuzzy set' approach to QCA, we measured the presence *and extent* of each attribute to understand which FPC demonstrated stronger or weaker formal articulations relative to one another. Each attribute was ranked as 'high', 'medium' or 'low' for each FPC. However, because there is no systematic measure of collaborative advantage

Table 1. Cases and interview participant information

Council (age)	Participant code	Professional occupation	Organization type
1 (Youngest)	W1	University research analyst	Embedded in Gov
	C1	FPC full-time staff	Embedded in Gov
2	C1	FPC full-time staff	Embedded in Gov
	C2	Non-profit vice president	Housed in non-profit
3	W3	Non-profit program coordinator	Housed in non-profit
	C3	Community organization director	Housed in non-profit
4	W4	Community organization director	Housed in non-profit
	C4	Non-profit program coordinator	Housed in non-profit
5 (Oldest)	W5	Non-profit program coordinator	Embedded in Gov
	C5	Produce farmer	Embedded in Gov

Note: In the participant codes, 'C' denotes an FPC chair and 'W' denotes an FPC member focusing on food waste (i.e., W1 is the participant code for the waste-focused member interviewed for FPC 1).

(i.e., the dependent variable or ‘outcome’ measure), we were unable to conduct a formal QCA. Despite this limitation, our comparative analysis makes a critical contribution to the TCA and GC literatures: we develop discrete measures of theorized drivers of collaborative advantage and measure them in a way (i.e., via document analysis) that can be easily replicated by future researchers and in larger-*N* studies.

Interview data collection and analysis

To examine how the theorized drivers work in practice and triangulate information found in the documents, we also conducted semi-structured interviews (Rubin and Rubin, 2005) with two members of each FPC: the chair or coordinator of the FPC, and a member focused specifically on food waste reduction ($n = 10$; Table 1). This method allows for the collection of data on FPCs’ collaborative activities, both within the council (i.e., among members) and within the community (i.e., through partnerships), to assess evidence for collaborative advantage in practice (RQ1b). This method of data collection is necessary given that such information is not often fully documented nor publicly available. When combined with the document analysis, these data facilitate an assessment of the patterns between articulated FPC structures and partnership activities that provide insight into how FPCs build collaborative advantage.

Interviewees were identified through discussion with the main FPC contact listed in the CLF dataset, who were then invited to participate via publicly available email addresses. The interviews, which lasted 30–90 min each, were conducted via Zoom video conferencing software in the fall and winter of 2020. Interviewees were first asked general questions about their FPC, such as when the council formed and how meetings are conducted, followed by more specific questions related to food waste reduction priorities, activities and achievements, including engagement with community partners (see Supplementary Appendix 1 for interview questions). All interviews were audio recorded and, to encourage participants to speak openly and truthfully, we promised to remove participant names and other identifying information from our research products. The data collection protocol, including a consent form, was approved by the Institutional Review Board at the corresponding author’s institution.

To analyze the interview data, the interview audio was transcribed verbatim, and the transcripts were coded in NVivo 12 Pro qualitative analysis software. Coding is a process by which statements in the transcripts are sorted into broad thematic categories (‘codes’) that house more specific sub-categories in

order to streamline the analysis of complex textual data. The codes used for this analysis were developed *a priori* based on the research questions and extant literature on collaborative advantage, which strengthens their validity because they are constantly in conversation with theory, as well as consistency in coding compared to more iterative grounded theory approaches (see Supplementary Appendix 2 for the codes used in this analysis and illustrative quotes assigned to each code). Two coders coded a full transcript together to promote reliability in coding, and one coder coded the remaining transcripts while regularly conversing with the other coder about their content and any confusion that arose. The coded data were then analyzed for patterns across different subsets (e.g., differences in activities across councils by organizational type, different perceptions of priorities from chairs vs food waste members, etc.) (Boyatzis, 1998). All quotations from the interviews presented in the ‘Results and discussion’ section are cited using the interviewee’s participant code from Table 1 to demonstrate that data were drawn from a variety of interviews.

Results and discussion

Building a foundation for collaborative advantage

First, we present the results of our comparative analysis of each FPC’s meta-strategy and monitoring mechanisms in Table 2 (RQ1a), as they were articulated in the FPC’s formal, written documents. We contextualize our document analysis results using insights from the interview data when discussing each tenet and its attributes.

Meta-strategy

As discussed in the ‘Theory’ section, meta-strategies promote collaborative advantage by allowing groups to create shared definitions of their goals and the ways in which they might reach them. In essence, a meta-strategy helps structure and justify the types of things that the collaborative group will do together and with external partners. While FPCs might not explicitly call this information a meta-strategy, they often articulate it through (1) a published mission and goals statements on their websites and/or county or city websites and/or (2) in their comprehensive food system plans. Table 2 displays the results of our evaluation of the presence and extent to which each of these attributes is articulated by each FPC in their written documentation.

All of the FPCs studied here have some version of mission and goals laid out on their public websites. These were evaluated first for their availability (i.e., ease of access and number of websites on which they are published), and then for their specificity. Three of

Table 2. Simplified comparative analysis of tenets and attributes of collaborative advantage for five food policy councils

FPC	Tenet 1: meta-strategy		Tenet 2: monitoring	
	Attribute 1: mission/goal	Attribute 2: food system plan	Attribute 1: meetings	Attribute 2: progress tracking
1	High	Not detected	High	Not detected
2	Medium	High	High	High
3	Low	Not detected	Medium	High
4	Low	High	High	Medium
5	Low	Low	Medium	Low

Note: Lighter gray shading represents a comparatively less robust example of a given attribute, while darker gray shading demonstrates a comparatively more robust example of the attribute across FPCs. White boxes indicate that no evidence of the attribute was found.

the FPCs (3, 4 and 5) had relatively broad mission and goal statements available only on their own website, which was evaluated to be 'low' for this criterion because it may have less reach to other key community organizations. FPC 2's mission and goals are also fairly broad but are stated on both their council website and the county's website, reflecting 'medium' availability and specificity. Lastly, FPC 1's mission and goals are replicated identically across the FPC, city and county websites. Moreover, some of their goals are broad (e.g., supporting nutrition education), while others are somewhat more specific (e.g., reducing heart disease, diabetes, etc.). As such, FPC 1 was rated as 'high' on availability and specificity of mission and goals.

We then assessed the presence and comprehensiveness of a food system plan for each FPC. FPCs 1 and 3 had no publicly available food system plan document that could be located. All other FPCs had published some version of a food system plan, so these were evaluated for level of detail, specificity of content and recency of updates to the publication. FPC 5 had a one-page document on their website that listed four goals along with sub-goals and intended activities to achieve them. Due to its brevity and lack of updates since 2014, this was evaluated as 'low'. FPCs 2 and 4 had much more robust food systems plans, which were developed with the city in one case and the county in the other. Both of these food system plans were published in 2017 and had comparably higher levels of detail, including proposed activities to achieve overarching goals and suggestions for measuring progress, leading them to be ranked as 'high' on this criterion. For example, FPC 2's plan included the overarching goal of developing a sustainable food supply with a related recommended action of implementing community gardens at food banks and pantries. They also articulated a metric to assess this goal: the volume of food grown and distributed from these gardens.

Our interview data emphasized why such elements of meta-strategy could foster the development of collaborative advantage in FPCs. For example, establishing a meta-strategy, especially as a collective, can help FPCs gain buy-in from diverse members and lay out pathways for achieving their goals. The chair of FPC 1 discussed an inaugural retreat where all the members spent a day working together to determine the council's shared priorities and how subgroups would work toward achieving them:

The first year, we had a retreat where we brought all our [members] together from the three [subgroups], and it was a full day retreat with breakouts, and it was so well-attended...That's when the [subgroups] developed their action plans (C1).

Similarly, the waste member from FPC 2 described how setting up an internal strategy for their group allows for collaborative and deliberative reflection and goal-setting:

One thing that's exciting for us right now is that as a council we're going through the strategic planning process and sort of trying to figure out 'What are we doing? What are we doing right? What do we need to do differently? How do we get more people to this table?' (W2).

Members of FPCs 3 and 4 described how members are prompted in such processes to propose their priorities as individuals, and then the FPC as a whole collaboratively decides which of these will be the focus for each period of the FPC's work:

...they send out this survey, so of course, we all have our priorities, and then they're in the process of compiling those goals and then just really

siphoning down to take a look at like three or four main things that we're going to focus on for the year (W3).

...we nominate ideas for where we'd like to focus, then we have a follow up meeting where we have a discussion, usually, about why or why not we might want to support a particular area, how we want to exactly define that area, what are the caveats (C4).

Given the interview data, it is clear the FPC's public documents and websites alone do not fully demonstrate the extent or depth of their meta-strategy development, making these interview insights particularly useful. However, to assess FPCs' ability to build collaborative advantage, it is also critical to understand if and how they implement their articulated meta-strategies.

Monitoring

Next, we assessed how FPCs monitor themselves to ensure their actions taken are in accordance with their meta-strategy, regardless of its level of specificity or visibility. Given that FPCs are designed as participatory stakeholder groups, they are well-positioned to serve a monitoring function that includes the majority of stakeholders in a local food system. To understand how each FPC collectively monitors progress on its activities—the second tenet of collaborative advantage—we evaluated two attributes: (1) the frequency of meetings held by each council, and (2) the ways in which they track progress toward their articulated goals (Table 2).

Regular meetings allow FPC members to communicate about actions across different priority areas, monitor the progress being made by others in the group and identify gaps in achieving their objectives. In all of the FPCs we studied, meetings occurred at least monthly, depending on the structure of the council. Councils that met just once per month (3 and 5) were evaluated as exhibiting a 'medium' level of meeting frequency because this was the standard frequency of meetings across all studied councils. In addition to regular monthly meetings, FPC 2 holds semi-annual 'progress meetings' to assess how they are meeting the goals identified in their food system plan. Moreover, FPCs 1 and 2 established subgroups (e.g., committees or task forces) to target specific priority areas, for which members attend additional meetings each month. The FPCs that exceeded the standard level of meetings, both in quantity and specificity of meeting goals (FPCs 1, 2 and 4), were thus evaluated as exhibiting a 'high' level of meeting frequency because they provided more opportunities for monitoring.

In addition, the ways in which FPCs track and report progress toward their stated goals is a key attribute of monitoring. This attribute was evaluated based on the presence of some mechanism for tracking progress and the frequency and specificity of reporting. FPC 1 had no apparent mechanism in place for tracking progress. FPC 5 published a cumulative list of accomplishments (e.g., initiated a particular program or hosted an event), but they did not include details or indicate how often the list is updated, which was evaluated as 'low'. FPCs 2, 3 and 4 each had unique and more robust ways of tracking progress, which were all evaluated as 'high'. As mentioned above, FPC 2 uses progress meetings to reflect on their priority areas and metrics to determine whether their actions are effective in moving toward their goals. FPC 3 keeps an up-to-date online dashboard of their progress and accomplishments based on 50 indicators, such as the number of people fed via a food rescue program. FPC 4 produces a digital annual progress report and publishes it on their website.

The interview data helped to further explain that monitoring mechanisms create both a sense of urgency in each FPC member and a sense of mutual assurance that the work assigned to others would be completed. In this way, monitoring can contribute to building collaborative advantage because members can be confident that others will be accountable for their assigned tasks and can therefore diversify their activities and partnerships. One interviewee in particular from FPC 4 mentioned the strong system of mutual accountability in their council:

There's a good structure, there's expectations that are set, and then there are people checking in with you if it seems like you're confused. And it's clear—you need to show up to these meetings, you need to do this work. If you don't, someone's going to check in with you (C4).

FPC 2's waste member also indicated a clear link between their FPC's food system plan and the meetings in which they monitor progress toward the plan's goals:

...all of [the FPC] meets two or three times a year, and that's a chance to share updates about the food [system] plan and also to help newcomers understand how [the council] as a whole works (W2).

Partnership activities as evidence of collaborative advantage

Next, we present our analysis of evidence of the potential development of collaborative advantage by FPCs via their partnership activities (RQ1b). We asked all interviewees about the activities they undertook with partners in the broader local food system, especially those specific to achieving food waste reduction goals. The FPCs studied here collaborated with diverse partners, including churches, food pantries, individual citizens, non-profit

organizations, governing bodies, corporations and many others. The FPCs developed these partnerships by recruiting individual volunteers, working with institutions and government agencies to initiate programs, and obtaining funding to make certain programs or activities possible, among other approaches. Based on the interview data, Table 3 summarizes the three most commonly discussed types of partnership activities—community education, creating food donation resource guides and increasing access to rescued food—along with illustrative quotations from interviewees. Critically, the specific activities undertaken by each FPC and their partners within these categories were often unique to their council and their local context. Except for FPC 4, each FPC studied here engages in one of the three most discussed activities.

Interviewees articulated several benefits related to partnering with community organizations to undertake such diverse food waste reduction activities. Specifically, all FPCs noted that their partners contributed unique skills, resources and capacity beyond what could be provided by the FPC alone. For instance, FPC 3 partners with nearly 1000 community volunteers to operate an extensive and highly productive gleaning program, in which leftover post-harvest produce is collected, or rescued, from farms:

Currently we have close to 1000 volunteers that we work with. It's just me, so I can go and pick for a couple, but I need like 25 people, and then whoa, I can get a truckfull of food to bring back to the produce stand (W3).

The food is then distributed to over 50 partner organizations, such as food pantries, senior housing and churches in the community. This program, which directly increases community access to rescued food—and thereby reduces food waste—would simply not be possible on such a large scale without the FPC's external partners:

Table 3. Most common partnership activities reported by FPCs

Activity (FPCs reporting this)	Illustrative quotation
Community education (FPCs 1, 3 and 5)	<p>'...one of our strategies is we're partnering with a middle school here and a couple of teachers...We're going to work with them to write PSAs, to do some video education, and to do some printables that are about simple ways to reduce your food waste...brought to you by seventh and eighth graders in your community' (C1).</p> <p>'We're actually creating a video right now that [the director of an economic equality non-profit] agreed to let us show it to her board of directors, and then hopefully get in front of some other boards, like the Chamber. More business-related organizations in the community' (C3).</p> <p>'The year after that we held the second [waste reduction summit], and this one was...held in conjunction with [a non-profit]...so, we did a combined thing, and it was really more focused on businesses. Not the receiving agencies, but the agencies that might be creating this excess. Another whole-day conference, really good discussion, got some new businesses that signed up to participate in food recovery, just kind of getting people to think about the issue' (W5).</p>
Creating food donation resource guides (FPCs 2 and 5)	<p>'...one thing we did achieve as a [subgroup] is that we worked with the Food Bank...to update their guidance to food donors, or would-be food donors about donating items that were out of date' (W2).</p> <p>'we created an online guide for food recovery in [our] County... I wanted to make sure that when somebody clicked into it, they could get immediate resources. Like, "Hey, I'm at a restaurant, and I have these two cases of cilantro that we're not going to use, and I don't want to see them rot and thrown away. What should I do with them?" So, the guide then could quickly give them the best option for who to call' (W5).</p>
Increasing access to rescued food (FPCs 1 and 3)	<p>'[the council] got together the content and some grant funding to build out a website that is a communications hub. You can go to that website now, and if you're hungry, if you need food, you can click on the "I Need Food" box, and you can see a bunch of different resources, and one of those is a map of the city, and it says, "[a meal-providing non-profit] will be here on this night of the week..." and it has the whole schematic, and then it has bus route information' (W1).</p> <p>'[A meal-providing non-profit] program also lent itself to that food waste [effort], where they were repurposing food that was donated from many different sources in the community, and they were repackaging the food and... they used part of it for meals, they added another meal to [a program] for seniors, and then they also were feeding some families, but they were coordinating with other programs through the Center for Public Service. They were also providing food for...a program to get families out of poverty' (C3).</p>

The most important thing is that ongoing relationship [with community partners]... because the more I connect with them, the less waste there is... (W3).

Similarly, FPC 5 noted how funding provided through a partnership with their municipality, as well as another FPC, has assisted them on a continual basis in engaging in food waste reduction activities. For instance, interviewee W5, who operates a non-profit small business incubation kitchen that obtains much of its food from donations in order to reduce waste, cited funds from the local government that helped them weather a challenging time:

...the City...did give us a grant two years ago, primarily because there was a major flood that went on...in August, right as harvest season was in full swing. So, there was a lot of farm crop that was lost (W5).

Churches, food pantries and other community organizations were also often credited with assisting the FPCs in the collection and distribution of recovered food and therefore food waste reduction, as exemplified by the following quote from interviewee W3:

We have, at our location, a huge produce stand. In addition, what we do is we will box it and send it out to about 52 of our community partners. And community partners with Backpack Programs, Senior Housing, Housing Authority, other food pantries throughout [the] County... Interfaith pantries, churches, so a variety of different people we send it out to (W3).

These data make it clear that the FPCs studied here engage in a wide variety of partnership activities to gain resources and capacity that allow them to reduce food waste on a larger scale than they could alone, providing evidence that partnership activities directly support the development of collaborative advantage in their food systems. Indeed, one of our participants practically named collaborative advantage as the reason they started the FPC that they now chair: 'our purpose is to do together what we can't do independently' (C1).

Conclusion and recommendations

Food systems, which are complex by nature, necessitate effective collaboration among stakeholders. Two crucial tenets—developing a meta-strategy and participatory monitoring mechanisms—can help FPCs create a structure for developing collaborative advantage in their local food systems (Huxham and Macdonald, 1992). In this study, we used multiple sources of data to assess whether and how five FPCs structure themselves according to these tenets, as well as whether their activities with local community partners provide evidence of collaborative advantage-building in practice.

Regarding RQ1a, we found that FPCs exhibited varying levels of the attributes associated with meta-strategy and monitoring in their planning documents and websites. Regarding meta-strategy, FPC members emphasized the importance of articulating goals and action plans as a collective, suggesting that FPCs may largely rely on informal norms to guide the development of their meta-strategy and that formal documentation of such efforts may be more sparse or vague (Ostrom, 2005). Additionally, despite the differences in meta-strategy, all of the FPCs studied here engage in some form of monitoring. They each hold regular meetings, and the majority of the councils either specify metrics for measuring progress or actively track and report progress to the public. Looking across the two tenets, FPCs 2 and 4 ranked

particularly highly on three of the four attributes of collaborative advantage examined, whereas FPC 5 did not rank highly on any of the attributes. Two attributes were not detectable for FPC 1, but they ranked highly on the other two that were observed. However, as will be discussed next, the interview data also indicated that all FPCs built some level of collaborative advantage in their communities, suggesting the potential for different approaches to be successful.

Regarding RQ1b, we found that food waste reduction activities with partners were seen as highly valuable and, critically, as things that the FPCs simply did not have the capacity or resources to do alone. Indeed, the importance of FPCs' external partnerships was emphasized explicitly in some interviews and implicitly in all of them. In other words, these data provided preliminary evidence that all FPCs built some level of collaborative advantage through partnerships. These findings are consistent with other literature on FPCs that characterizes their role as networkers and facilitators within complex food systems, rather than an entity that acts individually to meet its members' desired goals (Schiff, 2008; Harper *et al.*, 2009). However, the diversity of partnership activities undertaken by the five FPCs studied here also signifies a potential challenge for developing a systematic measure of collaborative advantage, even for one type of group in a single governance sector, reinforcing the need to develop more systematic outcome metrics for CG processes broadly (Koontz and Thomas, 2006).

Taken together, our findings suggest that there is not a single attribute of meta-strategy or monitoring that guarantees that an FPC can or will build collaborative advantage. Instead, combinations of attributes, such as implementing a robust monitoring system to track progress toward FPC goals, even if they are not clearly identified in a public document, may still facilitate the development of collaborative advantage. While this is a challenge for systematic comparative analysis, it can also be viewed as a strength of FPCs in practice: being able to creatively structure one's organization to address context-specific problems in a highly complex system may indeed be an FPC's greatest marker of success (Gupta *et al.*, 2018).

Moreover, collaborative advantage may look different depending on the context of the local food system as well as an FPC's organizational type (e.g., embedded in government or housed in a non-profit), which can impact its access to authority and resources. For example, of the two FPCs directly connected to local government, one (FPC 1) has a full-time staff member, while the other (FPC 5) has received consistent funding from their local government. None of the FPCs housed in non-profits mentioned these direct financial resources; however, several did mention having substantial access to volunteer networks and other community connections, which contributed to building collaborative advantage. Moreover, even FPCs housed in non-profits often have government actors who participate (e.g., FPC 2) and may bring additional or more stable resources to the table. Although it is not possible to detect a relationship between FPC organizational type and access to resources in this sample, this analysis should be taken up in future research on factors contributing to the development of collaborative advantage.

Recommendations for practice

Based on our novel application of TCA in the food systems context, we suggest three recommendations for improving the functioning of FPCs and similar collaborative groups, which can, in turn, improve the sustainability of local food systems more

broadly. While these recommendations were derived from an empirical analysis of FPCs in the USA, we argue that they are more broadly applicable, as FPCs with similar missions and approaches are proliferating across the globe (Siddiki *et al.*, 2015; Schiff, 2008). Moreover, our findings emphasize that the specific policy and programmatic actions of FPCs are highly dependent on their local context and membership, among other factors; thus, broader recommendations about how FPCs can be structured to maximize collaborative advantage, regardless of their specific goals and activities, are likely to have more practical value for existing FPCs, as well as for policymakers who desire to tackle food systems issues using CG approaches.

First, *FPCs should collaboratively create a comprehensive food system plan as a form of meta-strategy*. We observed two FPCs that had developed and published a food system plan. Some of the FPCs were so new that they had yet to develop an official plan but had set this as a priority for the following months. Others developed vague plans or did not provide a plan at all beyond their overarching goals. However, all FPCs emphasized the importance of collaborative and deliberative goal setting to create a structure for effective partnerships. Valuable insight may be gained by further investigating how the food system plans function differently than high-level goal statements in helping FPCs to reach their goals.

Developing a comprehensive and actionable food systems plan with explicit goals can also support the second tenet of collaborative advantage, which is carefully monitoring and tracking progress on goals. Hence, our second recommendation is that *FPCs should consistently and systematically track and measure progress toward goals*. While there is notable difficulty in accurately measuring certain issues, such as wasted food (Cattaneo *et al.*, 2021) and its reduction, FPCs should make all reasonable efforts to measure progress toward their core goals in order to better evaluate whether the collaboration is effective. For example, FPCs could leverage the Availability-Surplus-Recoverability-Waste (ASRW) model proposed by Garrone *et al.* (2014) to categorize and quantify potentially wasted food in their communities. Alternatively, FPCs may develop their own metrics and apply them systematically. FPC 2, for instance, specified indicators for each of their goals in their comprehensive food system plan. According to their food system plan, two indicators for reducing food waste were ‘pounds of food recovered for [...] County distribution’ and ‘pounds of food waste composted’. Although there is variability in the directness of these metrics, using some combination of them can provide clarity as to whether and how FPC activities are reducing the amount of food sent to the local landfill.

Using the ASRW model or other indicators to measure food waste and its reduction, in addition to providing feedback for the CG process, enables FPCs to report their progress to their community. Thus, our third and final recommendation is that *FPCs should consistently and transparently communicate the evidence of their progress to the community*. The benefits of transparently communicating progress to governing bodies, funding agencies and the public are twofold: it helps external stakeholders understand the value of the FPC’s work, which may extend the FPCs network, while also providing an additional monitoring mechanism since the reports are available for scrutiny and feedback from the community. By establishing specific food system plans, developing metrics for progress and applying them consistently and communicating the resultant evidence with the community, FPCs can create a strong foundation for collaborative advantage.

Limitations and future directions

A notable limitation in this study is that it was developed in January and February of 2020 just before the COVID-19 pandemic reached the USA. The data provided from the CLF that we used to identify cases for this study were collected in 2019 and showed an increase over prior years in FPCs listing food waste as one of their top three priorities. By the time interviews began in the fall of 2020, all of the FPCs we spoke with had deprioritized food waste, at least to some extent, in favor of emergency food access. While necessary, this decision likely impacted our discussions with participants about food waste reduction. At the same time, many news reports showed the coinciding events of long lines at food banks and perfectly good food rotting on fields or being dumped due to food supply chain disruptions from the pandemic. These issues highlight the critical role that FPCs might play in improving their local food system by working across complementary issues, such as food security and food waste, in order to more efficiently leverage time and resources. Further research should thus examine how FPCs address these types of complementary issues and whether such an approach can further build collaborative advantage. Additionally, this research was limited in its focus on FPCs’ food waste reduction efforts. Future research should examine other common FPC goals to better understand how existing meta-strategy and monitoring mechanisms translate into effective collaboration and outcomes. Finally, future studies should expand the number and breadth of FPCs evaluated and better articulate the specific rules they use for both internal decision-making and external collaborations to better specify the mechanisms underlying the development of collaborative advantage.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/S1742170523000285>.

Acknowledgements. We would like to thank the Johns Hopkins University Center for a Livable Future for providing the Food Policy Networks dataset and the individuals who shared their insight through interviews.

Author contributions. N. N. led in formulating research questions, designing the study, collecting and analyzing data and writing, and collaborated on interpreting the findings. E. K. led in interpreting the findings and editing the manuscript, and collaborated on formulating research questions, designing the study and collecting and analyzing data, including providing training on relevant software.

Financial support. This work was supported by the University of Nevada, Reno, Office of Undergraduate Research and the Ronald E. McNair Scholars program. The funders had no role in the design, analysis or writing of this article.

Competing interest. None.

References

- Ambrose G, Siddiki S and Brady U (2022) Collaborative governance design in local food systems in the United States. *Policy Design and Practice* 5, 362–383.
- Anderson R, Bayer PE and Edwards D (2020) Climate change and the need for agricultural adaptation. *Current Opinion in Plant Biology* 56, 197–202.
- Ansell C and Gash A (2008) Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory* 18, 543–571.
- Aschemann-Witzel J, de Hooge IE, Rohm H, Normann A, Bossle MB, Grønhoj A and Oostindjer M (2017) Key characteristics and success factors of supply chain initiatives tackling consumer-related food waste—a multiple case study. *Journal of Cleaner Production* 155, 33–45.

- Barrera EL and Hertel T** (2021) Global food waste across the income spectrum: implications for food prices, production and resource use. *Food Policy* **98**, 101874.
- Boyatzis RE** (1998) *Transforming Qualitative Information: Thematic Analysis and Code Development*. Thousand Oaks, CA: Sage.
- Byrne D and Ragin C** (2009) The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In *The SAGE Handbook of Case-Based Methods*. London, UK: SAGE Publications Ltd, p. 222. <https://doi.org/10.4135/9781446249413.n13>
- Cattaneo A, Sánchez MV, Torero M and Vos R** (2021) Reducing food loss and waste: five challenges for policy and research. *Food Policy* **98**, 101974.
- Clayton ML, Frattaroli S, Palmer A and Pollack KM** (2015) The role of partnerships in US food policy council policy activities. *PLoS ONE* **10**, e0122870.
- Cristofoli D, Douglasb S, Torfing J and Trivellato B** (2021) Having it all: can collaborative governance be both legitimate and accountable? *Public Management Review* **24**, 1–25. <https://doi.org/10.1080/14719037.2021.1960736>
- de Moraes CC, de Oliveira Costa FH, Roberta Pereira C, da Silva AL and Delai I** (2020) Retail food waste: mapping causes and reduction practices. *Journal of Cleaner Production* **256**, 120124.
- Emerson K and Nabatchi T** (2015) *Collaborative Governance Regimes*. Washington, DC: Georgetown University Press.
- Food and Agriculture Organization of the United Nations (FAO)** (2019) *The state of food security and nutrition in the world: safeguarding against economic slowdowns and downturns*.
- Food Policy Networks (FPN)** (2020) *Food policy groups around the world*. Available at <https://www.foodpolicynetworks.org/councils/fpg-worldwide/>
- Garrone P, Melacini M and Perego A** (2014) Opening the black box of food waste reduction. *Food Policy* **46**, 129–139.
- Guerrero AM, Bodin Ö, McAllister RJ and Wilson KA** (2015) Achieving social-ecological fit through bottom-up collaborative governance: an empirical investigation. *Ecology and Society* **20**, 41.
- Gupta C, Campbell D, Munden-Dixon K, Sowerwine J, Capps S, Feenstra G and Van Soelen Kim J** (2018) Food policy councils and local governments: creating effective collaboration for food systems change. *Journal of Agriculture, Food Systems, and Community Development* **8**(suppl. 2), 11–28.
- Gustavsson J, Cederberg C and Sonesson U** (2011) Global food losses and food waste: extent, causes and prevention; study conducted for the International Congress Save Food! At Interpack 2011, [16–17 May], Düsseldorf, Germany. Food and Agriculture Organization of the United Nations.
- Hall KD, Guo J, Dore M and Chow CC** (2009) The progressive increase of food waste in America and its environmental impact. *PLoS ONE* **4**, e7940.
- Halloran A, Clement J, Kornum N, Bucatariu C and Magid J** (2014) Addressing food waste reduction in Denmark. *Food Policy* **49**, 294–301.
- Harper A, Shattuck A, Holt-Giménez E, Alkon A and Lambrick F** (2009) *Food policy councils: lessons learned*. Institution for Food and Development Policy. Available at <https://foodfirst.org/wp-content/uploads/2014/01/DR21-Food-Policy-Councils-Lessons-Learned-.pdf>
- HLPE** (2014) *Food losses and waste in the context of sustainable food systems*. 117.
- Huntjens P, Lebel L, Pahl-Wostl C, Camkin J, Schulze R and Kranz N** (2012) Institutional design propositions for the governance of adaptation to climate change in the water sector. *Global Environmental Change* **22**, 67–81.
- Huxham C** (1996a) Advantage or inertia: making collaboration work. In Paton R, Clark G, Jones G and Quintas P (eds), *The New Management Reader*. London, UK: Routledge, pp. 238–254.
- Huxham C** (ed.) (1996b) *Creating Collaborative Advantage*. London, UK: Sage.
- Huxham C and Macdonald D** (1992) Introducing collaborative advantage: achieving inter-organizational effectiveness through meta-strategy. *Management Decision* **30**, 50–56.
- Huxham C and Vangen S** (2013) *Managing to Collaborate: The Theory and Practice of Collaborative Advantage*. Abingdon, UK: Routledge.
- Johns Hopkins Center for a Livable Future (CLF)** (2019) Food policy council directory [data file and personal communication]. Accessed July 7, 2020.
- Kiminami L** (2016) Food security and collaborative advantage: scoping the scene. In *Food Security and Industrial Clustering in Northeast Asia*. Tokyo: Springer, pp. 1–18.
- Koebele EA** (2020) Cross-coalition coordination in collaborative environmental governance processes. *Policy Studies Journal* **48**, 727–753.
- Koontz TM and Thomas CW** (2006) What do we know and need to know about the environmental outcomes of collaborative management? *Public Administration Review* **66**, 111–121.
- Kossmann CM, Behagel JH and Bailey M** (2016) Action and inertia in collaborative governance. *Marine Policy* **72**, 21–30.
- Lubell M** (2015) Collaborative partnerships in complex institutional systems. *Current Opinion in Environmental Sustainability* **12**, 41–47.
- Ostrom E** (1990) *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, UK: Cambridge University Press.
- Ostrom E** (2005) *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press.
- Ostrom V, Tiebout CM and Warren R** (1961) The organization of government in metropolitan areas: a theoretical inquiry. *The American Political Science Review* **55**, 831–842.
- Pahl-Wostl C and Knieper C** (2014) The capacity of water governance to deal with the climate change adaptation challenge: using fuzzy set qualitative comparative analysis to distinguish between polycentric, fragmented and centralized regimes. *Global Environmental Change* **29**, 139–154.
- Poore J and Nemecek T** (2018) Reducing food's environmental impacts through producers and consumers. *Science* **360**, 987–992.
- Porter ME** (1985) *Competitive Advantage: Creating and Sustaining Superior Performance*. New York, NY: Free Press.
- Ragin CC** (1987) *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Oakland, CA: University of California Press.
- Rubin HJ and Rubin IS** (2005) *Qualitative Interviewing: The Art of Hearing Data*. Los Angeles, CA: Sage.
- Scherb A, Palmer A, Frattaroli S and Pollack K** (2012) Exploring food system policy: a survey of food policy councils in the United States. *Journal of Agriculture, Food Systems, and Community Development* **2**, 3–14.
- Schiff R** (2008) The role of food policy councils in developing sustainable food systems. *Journal of Hunger and Environmental Nutrition* **3**, 206–228.
- Siddiki SN, Carboni JL, Koski C and Sadiq A-A** (2015) How policy rules shape the structure and performance of collaborative governance arrangements. *Public Administration Review* **75**, 536–547.
- Sullivan A, White DD and Hanemann M** (2019) Designing collaborative governance: insights from the drought contingency planning process for the lower Colorado river basin. *Environmental Science and Policy* **91**, 39–49.
- Yin RK** (2009) *Case Study Research: Design and Methods*, 4th Edn. Thousand Oaks, CA: Sage Publications.