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IN THIS ISSUE
DUNCAN HILCHEY

Fostering socially and ecologically resilient food and farm systems through research networks

Published online September 17, 2023

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In this summer issue, we offer the first installment of a special set of papers in response to the call entitled "**Fostering Socially and Ecologically Resilient Food and Farm Systems Through Research Networks**," sponsored by the tripartite partnership of the Inter-institutional Network for Food, Agriculture, and Sustainability (INFAS), eOrganic, and the USDA's National Institute of Food and Agriculture (NIFA). We appreciate their support for furthering the literature on this topic. Additional papers in response to the call will follow in the forthcoming fall issue.

On the cover of this issue, Rebecca Ivanoff (at left) and Nicola Inglefield (at right) kneel in a pepper patch that was part of Rebecca's multifarm sweet pepper breeding project in cooperation with the Ecological Farmers Association of Ontario's (EFAO) Farmer-Led Research Program—note their farmer-researcher sign! Rebecca and Nicola also conducted a trial in cooperation with EFAO testing different methods for cabbage seed production. See more about this work in the article in this issue, *Farmer knowledge as formal knowledge: A case study of farmer-led research in Ontario, Canada.*

On our cover: Rebecca Ivanoff, left, and Nicola Inglefield, right, kneel with their farmer-researcher sign in a pepper patch that was part of Rebecca's multifarm sweet pepper breeding project in cooperation with the Ecological Farmers Association of Ontario's (EFAO) Farmer-Led Research Program. Rebecca and Nicola also conducted a trial in cooperation with EFAO testing different methods for cabbage seed production. See more in the article in this issue, *Farmer knowledge as formal knowledge: A case study of farmer-led research in Ontario, Canada.*

Photo by Rebecca Ivanoff and used with permission.

Network-building is a fundamental activity of food system–based community development, and the scholar and practitioner research amalgam has become the gold standard. The lead guest editors of this special section, **Michelle Wander** and **Jessica Guarino**, both of University of Illinois at Urbana-Champaign, and assisted by **Julie Dawson** (University of Wisconsin–Madison), **Carmen Ugarte** (University of Illinois Urbana-Champaign), and **Alice Formiga** (Oregon State University), are curating a seminal collection of papers on the subject, providing a snapshot of state-of-the-art research on network-building and governance. You'll see their thematic editorial along with the second instalment of papers.

John Ikerd launches this issue with his "The Economic Pamphleteer" column, *Agri-food corporations are not real people; why does it matter?*, in which he argues that while real people suffer the social and ethical consequences of their irresponsible actions, corporations do not, and that the only power greater than corporate power is the political power of the people—working together.

Next, in their commentary *Treatment of racism and social injustice in addressing complex topics: What we learned*, **Kathryn Ruhf** and **Kate Clancy** share their experience in authoring a publication that, upon reflection, could have elevated the issue of racial justice.

Our first group of papers addressing the special topic on research networks explores the challenges and opportunities in farmer-researcher networks.

In *Farmer knowledge as formal knowledge: A case study of farmer-led research in Ontario, Canada*, **Erin Nelson**, **Sarah Hargreaves**, and **Dillon Muldoon** present a case study of a robust farmer-led research project that was successful in encouraging members to adopt and/or improve ecological practices on their farms.

Next, **Benjamin Schrager**, **Hiroki Ikeda**, and **Takahashi Yukitsugu** show how thoughtful program negotiations are required to address tensions when the goals of research institutions and stakeholders differ in *Successes and challenges of a university-based agroecological community garden and educational program in Japan*.

In the final special-topic paper in this issue, *Intellectual property exhaustion, breeder frustration, and hindered innovation: Reviewing U.S. organic corn seed development*, **A. Bryan Endres**, **Jessica Guarino**, and **Nabilah Nathani** provide an overview of the challenges in intellectual property rights surrounding seed innovation and sharing, especially regarding the closely guarded nature of private contracts that parties are reluctant to reveal.

As usual, our open call papers in this issue cover wide-ranging ground, from farmers and farmland to value-chain development to community food security.

In their paper *"We need a better system": Maryland crop growers' perspectives on reducing food loss through donation*, **Caitlin Ceryes**, **Kathryn Heley**, **Danielle Edwards**, **Chergai Gao-Rittenberg**, **Leah Seifu**, **Saifra Khan Sohail**, and **Roni Neff** assess the motivations, barriers, and facilitators for crop donation as a strategy for reducing food loss and waste.

Jennifer Anne Gerhart and **Philip Howard** then pair production cost estimates with buyer willingness-to-pay estimates to generate a more comprehensive assessment of profitability in a complex value chain in their paper, *Assessing the profitability of scaling up for retail access: Lessons from local salad mix in Southeast Michigan.*

Next, in *Raising awareness and advocating change: The work of Nova Scotia's food security NGOs,* **Gregory Cameron, Julia Roach, Steven Dukeshire,** and **Delaney Keys** use the FAO's four orientations of food security—food availability, food access, food utilization, and food stability—and discover that this mainstream framework may not fully capture the more complex and nuanced activities of smaller community-based nonprofits in some regions.

This is followed by two papers by Campbell et al., focused on institutional foodservice programming. In the first, *Values-based institutional food procurement programs: A narrative review*, **Catherine Campbell** puts a spot-

light on the tension between the limitations and strictures of mainstream foodservice procurement and critical social and environmental objectives of stakeholder groups in the value chain.

And in a companion paper, *Locally supported, values-based framework for a university foodservice program: Results of a Delphi study*, **Campbell**, along with **Cody Gusto** and **John Diaz** used expert and stakeholder input to generate eight core values and six categories of metrics that were supported by local and regional food systems stakeholders at the University of Florida and in the surrounding community.

This is followed by **Hannah Ramer** and **Kristen Nelson**, who argue that maximizing the level of civic participation increases the changes for racial equity in their paper *Digging in: Toward a more just urban garden land policy*.

Next, in *Engaging, empowering, and evaluating farm-to-school projects with photovoice*, **Shoshanah Inwood**, **Joy Rumble**, **Sara Meeks**, and **V. Ryan Haden** offer a reflective essay on their use of a visual narrative approach to study a F2S program in rural Ohio.

In *Reflection on the Groceries to Graduate scholarship program at Missouri Southern State University*, **Megan Bever, Amber Carr, Kamryn Colburn, Andrea Cullers,** and **J. P. Rutledge** present early results of a student food-security program that has promise but also shortcomings that need to be addressed.

Natalie Call, **Elizabeth Silber**, and **E. Binney Girdler** then conduct a GIS-based analysis to demonstrate how franchise convenience stores and dollar stores are filling gaps in the availability of food in lower income areas with no full-service grocery stores in *Food access in Kalamazoo, Michigan: A spatial analysis.*

We wrap up this issue with five book reviews. **Danielle Schmidt** reviews *The Sociology of Farming: Concepts and Methods,* by Jan Douwe van der Ploeg. **Xiaoya Yuan** reviews *Growing Gardens, Building Power: Food Justice and Urban Agriculture in Brooklyn*, by Justin Sean Myers. **Tristian Lee** reviewed *White Burgers, Black Cash: Fast Food from Black Exclusion to Exploitation* by Naa Oyo A. Kwate. **Mallory Cerkleski** reviews *Translating Food Sovereignty: Cultivating Justice in an Age of Transnational Governance*, by Matthew C. Canfield. And lastly, **Ryder Bell** reviews *Edible Economics: A Hungry Economist Explains the World*, by Ha-Joon Chang.

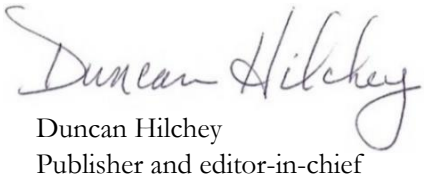
In wrapping up this editorial, I want to circle back to our special issue theme of networks. Despite much public investment, we have yet to fully grasp how the human brain stores and processes information. With a network of roughly 100 *billion* neurons and over 100 *trillion* synaptic connections, the average human brain is its own unfathomable universe. And much like the human brain, the food movement is a complex network of food and agricultural organizations around the Earth that is neither well understood nor fully applied. As we share a common fate in this "VUCA world"—one that is increasingly volatile, uncertain, complex, and ambiguous—we should be working harder to expand and connect our local, regional, national, and international networks. We can do that by utilizing organizational synapses (like JAFSCD and its sister program, the North American Food Systems Network[1]) to bridge geopolitical divides. There is simply too much at stake not to link up and work collaboratively as researchers and practitioners around the globe.

To that end, Managing Editor Amy Christian and I are traveling to Europe this fall to visit with colleagues and solicit input on a new call for papers on the subject of "community-based circular food systems." Our objective on this trip is to help bridge what is, after all, just a large body of water that divides us. In so doing, we want to grow JAFSCD to be a truly international journal by showcasing our common challenges along with the shared opportunities and collective actions we can engage in to ensure planetary resilience.

[1] See more about NAFSN at https://foodsystemsnetwork.org

Please contact me at duncan@lysoncenter.org if you have specific ideas and recommendations on how JAFSCD can play a role in making this happen.

Yours for a more networked world,



Duncan Hilchey
Publisher and editor-in-chief

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THE ECONOMIC PAMPHLETEER
JOHN IKERD

Agri-food corporations are not real people; why does it matter?

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Corporations are not *real* people. This may seem obvious, but for more than a hundred years the U.S. Supreme Court has recognized corporations as legal persons with many of the same constitutional rights as real people (Torres-Spelliscy, 2014). Why does it matter? Because corporations can do things that real people can't and yet are immune to legal liabilities that real people must consider. The lack of economic competitiveness in agri-food markets is one consequence of treating corporations as real people. So is the lack of government protection of farm and food workers from exploitation and the natural environment from extraction and pollution. Recent examples include concerns about corporate price gouging following the COVID-19 pandemic (Reich, 2022) and the weakening of the Environmental Protection Agency's authority to restrict corporate pollution (Feldscher, 2022).

Corporate charters granted by state governments allow groups or people to act as single entities rather than as individuals. The most common example is for-profit corporations that allow hundreds or thousands of people to combine their

John Ikerd is professor emeritus of agricultural economics, University of Missouri, Columbia. He was raised on a small farm and received his B.S., M.S., and Ph.D. degrees from the University of Missouri. He worked in the private industry prior to his 30-year academic career at North Carolina State University, Oklahoma State University, the University of Georgia, and the University of Missouri. Since retiring in 2000, he spends most of his time writing and speaking on issues of sustainability. Ikerd is author of six books and numerous professional papers, which are available at http://johnikerd.com and https://ikerdj.mufaculty.umsystem.edu.

*Why an **Economic Pamphleteer?** In his historic pamphlet* Common Sense, *written in 1775–1776, Thomas Paine wrote of the necessity of people to form governments to moderate their individual self-interest. In our government today, the pursuit of economic self-interest reigns supreme. Rural America has been recolonized, economically, by corporate industrial agriculture. I hope my "pamphlets" will help awaken Americans to a new revolution—to create a sustainable agri-food economy, revitalize rural communities, and reclaim our democracy. The collected Economic Pamphleteer columns (2010–2017) are at https://bit.ly/ikerd-collection*

investments to form a single corporation. In the absence of a corporate charter, this would be considered collusion. Historically, corporations were authorized by governments for the expressed purpose of serving specific public interests more effectively than real persons acting individually (Wells, 2021).

Even though their primary responsibility was to their shareholders, corporations historically were required to conduct business in ways that served the public interest more effectively than would investors acting individually. For example, consumers and society, in general, supposedly benefit from the economics of scale made possible by large agri-food corporations—as explained in previous columns (Ikerd, 2023a, 2023b). Historically, corporations that failed to serve public interests were restrained by government regulations or restructured through the enforcement of anti-trust laws (Halloran, 2018).

The primary purpose of for-profit corporations today is generally accepted as serving the common or collective interests of their shareholders.

The legal responsibilities of corporations to serve both public and private interests were consistently upheld by court decisions through the 1950s (Wells, 2021). It's only since the1980s that serving the public interest has been minimized or omitted from the legal responsibilities of for-profit corporations. The interests of other corporate stakeholders—employees, customers, suppliers, and communities—are considered only to the extent that doing so contributes to shareholders' economic interests (Lipton et al., 2020). The primary purpose of for-profit corporations today is generally accepted as serving the common or collective interests of their shareholders.

The legal precedent for corporate personhood dates back to a declaration by Chief Justice Waite of the U.S. Supreme Court in 1886. Before formal proceedings began, the Chief Justice said, "The Court does not wish to hear argument on the question whether the provision in the Fourteenth Amendment to the Constitution which forbids a state to deny to any person within its jurisdiction the equal protection of the laws applies to these corporations. We are all of [the] opinion that it does" (*Santa Clara County v. Southern Pacific Railroad Co.*, 1886, "Syllabus," para. 7). This was not a part of the court's official opinion but simply a statement by the chief justice that was made prior to the presentation of arguments. Regardless, the declaration has since been used consistently as a precedent by courts in corporate-related decisions.

The precedent has been challenged periodically but has nonetheless prevailed. In a dissenting opinion in 1949, Justices Douglas and Black pointed out that the Fourteenth Amendment was clearly meant to protect the civil rights of real people, specifically recently freed enslaved people, not to protect the economic rights of corporations (*Wheeling Steel Corp. v. Glander*, 1949). In a 1978 dissenting opinion, Justice Rehnquist questioned the wisdom of extending political rights to corporations. He pointed out that the Fourteenth Amendment was intended to apply to real people, not legally created entities, and that there were real dangers in extending the political rights of people to corporations (*First Nat'l Bank of Boston v. Bellotti*, 1978).

Over the years, the legal rights of corporate *personhood* have been expanded by the courts, while the legal responsibilities of corporations to serve the public interest have been contracted. Perhaps the most prominent recent example is the 2009 Supreme Court case *Citizens United v. the Federal Election Commission*. The Court held that "limiting independent expenditures on political campaigns by groups such as corporations, labor unions, or other collective entities violates the First Amendment because limitations constitute a prior restraint on speech" (*Citizens United v. FEC*, 2010). This ruling allows corporations to have a far greater influence on elections and other political decisions than do the ordinary real persons who are supposedly granted equal political rights by the U.S. Constitution. A 2014 Supreme Court ruling went even further, granting for-profit corporations the same

constitutional freedom of religion as real people (*Burwell v. Hobby Lobby Stores*, *Inc*., 2014).

But why shouldn't corporations have the same political rights as real people? As currently defined, for-profit corporations are purely economic entities organized and managed for the purpose of maximizing economic returns for their investors/shareholders. Whenever corporations are allowed to participate in political activities, whether by influencing elections or public policies and government regulations, their logical motivation is to increase their competitive advantages in markets and to remove any legal restraints to maximizing the economic interest of their shareholders—regardless of the social or ecological consequences. There are no social or ethical *incentives* for the actions of corporations, other than those that also serve the economic interests of their shareholders. There are no social or ethical *restraints* on their actions either, other than those imposed by the government.

Real people suffer the social and ethical consequences of their irresponsible actions; corporations do not and cannot.

Real people are motivated and restrained by the economic, social, and ethical consequences of their actions. A real person is an economic, social, and ethical being who pursues a multidimensional quality of life. The real people who are shareholders in corporations have the same social and ethical capacity as other real people. However, in the large, impersonal, publicly owned corporations that dominate the economy, there is no way of knowing what the mix of social and ethical values may be among the thousands of shareholders from many parts of the world. Most investors with stock in pension funds and mutual funds don't even know how many of which shares they own at any given time. Some investors own individual stocks for only a few days, hours, or minutes. The only interest corporate investors have in common is their desire to increase the economic value of their investments. Corporate managers who do not understand this are soon replaced by managers who do. The for-profit corporation of today is a purely economic being—not a real human being.

Admittedly, some real people hold the same political views as corporations, in that they give private economic interest priority over ethical and social responsibilities. The difference is that a for-profit corporation has no capacity to develop or express a social conscience or set of purely ethical values. Real people suffer the social and ethical consequences of their irresponsible actions; corporations do not and cannot. While corporate officers and executives may suffer social or ethical consequences for their actions, the only penalties a corporation can be assessed or can suffer are purely economic. Corporations also limit the liability of investors for the adverse economic consequences of their actions. When the Supreme Court ruled to allow unlimited campaign contributions by corporations, they failed to recognize the inherent lack of social or ethical capacity of for-profit corporations—or other corporations that are not legally obligated to charitable causes or public service. When the government weakens the enforcement of antitrust regulations, it leaves consumers vulnerable to economic exploitation. When the courts weaken the EPA and other government regulatory agencies, they leave fragile natural ecosystems and scarce natural resources vulnerable to corporate pollution and exploitation.

The only power greater than corporate power is the political power of the people—working together.

The fundamental *economic* purpose of government is to ensure that the economy serves the public interest of society in general. This purpose is expressed in the preamble to the U.S. Constitution: "to establish justice … [and] promote the general welfare … for ourselves and our posterity." While corporations in general benefit from effective governance, individual corporations have no economic incentive to contribute to or support the effective-

ness of government. The only power greater than corporate power is the political power of the people—working together. Only real people, acting together through government, can ensure that for-profit corporations serve the public interest of society as well as the private interests of shareholders.

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JAFSCD COMMENTARY

Treatment of racism and social injustice in addressing complex topics: What we learned

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Upon the initial release of our report, *A Regional Imperative: The Case for Regional Food Systems* (Ruhf & Clancy, 2022), we received criticism about our "treatment of racism and racial equity" from the Northeast Sustainable Agriculture Working Group (NESAWG), the report's original sponsor. While this criticism was unsettling to us and was not accompanied by specific feedback, we acknowledged that we could have done more on the racial justice aspects of regional food systems. Despite lengthy sections on social justice, references to oppressed communities, and suggested remedies throughout the text, our original report fell short in certain important ways, and we wanted to strengthen it.

As a path forward, we worked with the Thomas A. Lyson Center for Civic Agriculture and Food Systems to publish and promote the report as a "discussion version." We solicited public feedback and convened a Discussion Team of four scholar-practitioners of diverse backgrounds, expertise, and experience. They commented on the report's language and omissions with respect to racism and racial inequity. Beyond these concrete corrections, the process of reflection and dialogue with our Discussion Team deepened our own ex-

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Disclosure

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ploration of how to treat racism, racial equity, and social justice in endeavors such as our report. We share these reflections here, and also refer the reader to the final report (Ruhf & Clancy, 2002).

While we, two elder white women, have fought for social justice for many decades in various arenas and strive to work in allyship with oppressed communities, we recognize how easy it is to take our whiteness for granted. It has been humbling to navigate our response to the negative reactions and to being publicly "called out" without feeling or appearing defensive. Certainly, the experience has increased our awareness about the hurt that can be caused, regardless of its inadvertent or unintentional origins.

Treatment Strategies

We want to better understand how oppression can or should be treated in studies like ours where the topic, in this case regionalism and regional food systems, is multidimensional. Our report elaborates on seven dimensions of regional food systems, including food needs and supply, economic development, and social and economic justice. There are various ways to treat oppression when it is one of many parts of a broad and complex subject. It can be genuinely or gratuitously acknowledged. It can be ignored. For white people for whom confronting racism and promoting equity are core values, these approaches are not options. We have arrived at five treatment strategies: centering, intersecting, framing, infusing, and informing. Following discussion of the five strategies, we share observations on the current "call-out culture," and offer a few suggestions for addressing racism and other forms of inequity in studies of other topics.

Centering. When NESAWG criticized us for not "centering" the report on race, we wanted to understand what that meant. NESAWG does not have its own working definition of centering race (Northeast Sustainable Agriculture Working Group, 2022). We learned from various sources that centering race and racial equity is envisioned in different ways. Many organizations publish racial equity statements in which they commit to centering racial equity by holding it as a core value, operating with it as a priority, and confronting structural racism in their work. For Kania et al. (2022), strategies for centering equity include grounding the work in data and context and targeting solutions, focusing on systems change in addition to programs and services, shifting power and building equity leadership, and acting with community. Lina Houston, an attorney of color, addressing white people, offers "7 ways to support and center people of color," including recognizing and checking privilege, understanding oppression, recognizing intent versus impact, educating oneself and one's white friends, and collaborating and connecting with communities of color (Houston, 2016).

The lens, or orienting framework through which a particular topic is addressed is relevant, indeed consequential in food systems work as in other endeavors. For example, Passidomo argues that there is "need to go 'beyond food' through research that positions food as a lens through which pressing social and political issues and processes may be critically examined" (2013, p. 92). The analytical lens might be capitalism, patriarchy, ecofeminism, or a particular religion, for example. For some groups, which may include NESAWG, centering means viewing ideas and actions exclusively through a racial justice lens, solely or primarily based on the direct experiences of and analyses by persons and groups of color. To be clear, we believe that "white centering"—the centering of white people and their values, norms, and feelings over others (Saad, 2020)—has no place in the work of advancing social justice.

We believe that each centering orientation has merit and power. In our report, we center fighting oppression and advancing racial equity and, more broadly, social justice, as core values and central strategic priorities. That said, the report is not written through a racial justice lens; such a specific focus was beyond our scope and capacity, and would have been misguided and presumptuous without substantial direction, if not lead authorship, by partners of color. We hope that others will contribute racial equity analyses of regional food systems.

Intersecting. In food systems, multiple forces of oppression and marginalization are at work. As systems thinkers, we looked at how and where op-

pression and regional food systems intersect. These intersections are noted throughout the report. We point out the patterns and consequences of oppression on various groups and in certain settings *in the context of regional food systems*. We also point out that in some ways, a region in itself may not be an especially effective scale at which to address oppression and advance social justice. Nonetheless, we discuss many reasons and opportunities to be attentive to social justice at a regional scale. It seems to us that the intersections between oppression and a particular concern will vary depending on the content, context, purpose, and audience. Nevertheless, authors and researchers should always be accountable to social justice values.

Legal scholar Kimberlé Crenshaw (2017) has offered a more particular take in coining the term "intersectionality" (now included in standard dictionaries) to describe how systems of oppression overlap and how multiple marginalized social identities interact and compound the impacts of oppression. This concept of the interconnected nature of social categorizations such as race, class, and gender certainly applies within food systems. Intersectionality could appropriately describe how race, ethnicity, and gender are layered upon members of other marginalized—that is, distanced from power and resources—communities such as small farmers, farmworkers, and food-chain workers.

Framing. In our 2007 chapter on social change movements in food systems (Stevenson et al., 2007), we discussed framing as the process of describing social problems around shared meanings that can mobilize groups to action. Frames differ in their comprehensiveness. Master frames are most inclusive, bringing together various subissues and networks and providing a unifying message. (Note: While we recognize that the word "master" may be offensive to some readers, the term "master frame" is embedded in sociology and social movement theory.) Racial injustice is a highly mobilizing frame, within which the particular dynamics of the Black, brown and Indigenous experiences are subframes.

In food systems, a more comprehensive frame focusing on oppression can include marginalized groups such as immigrant and refugee farmers and consumers, farm and food workers, low-income rural and urban food shoppers, and some agri-food business owners. In our report, social justice—the fair distribution of social benefits and opportunities—is a master frame that includes the multiple marginalized, oppressed, and disadvantaged groups who were discussed in the report. The power of this master frame comes in part from its potential to point to structural concerns.

There are pros and cons as to how issues are framed in material such as our report. One challenge for a broad master frame is the fact or perception that attention to a particular issue or group is superficial or diluted. Certainly, the history and experience of Black people in the U.S. is unparalleled, and its salience cannot be overstated. On the other hand, an advantage of a powerful master frame can be in strategic overlap and complementarity, resulting in greater strength, solidarity, and impact for change. Perhaps it merits emphasis that our overarching reason for advocating for stronger regional food systems is for their contributions to sustainability, resilience, and social justice.

Infusing. In this context, infusing means to fill or imbue material in order to affect it substantially. Several academic institutions (e.g., University of Memphis, 2021; Champine, 2021) and nonprofit organizations have committed to infusing justice, equity, and diversity into their curricula and programming, by addressing how racial inequities are relevant to and confronted in related material, filling gaps and inaccurate representations, and assuring that information is adequate and appropriately sourced. For us, it means acknowledging the roots of contemporary inequities and placing analyses in their historic and multicultural contexts.

From the beginning of our writing, we strove to infuse the report, including our suggestions for action, with concerns about oppression and equity. At times the frame was specific to race; at other times social justice was the relevant master frame. Our Discussion Team helped us identify more places in the report that would highlight the inequities faced by particular communities of color. There is always the challenge that an infusion is superficial or otherwise insubstantial, which raises questions such as, What is adequate or optimal?

How much emphasis? For what purposes and audiences? Who determines?

Informing. What sources are used to inform works such as this report? What information and review procedures are appropriate, legitimate, sufficient? As white women, we acknowledge the boundaries of our lived experience. We are not persons of color, farmers, food workers, or people who have experienced food insecurity. Having researched, published, presented and collaborated on food systems, and more specifically regional food systems, for several decades, we have had experience in seeking a variety of reputable sources of information and opinion. We pursued the best available resource material and input about racial equity and social justice—data, research, articles, and lived and reported experience—under our given circumstances, and utilized them in as many places as made sense to us.

Nevertheless, the three years during which we researched and wrote this report were greatly affected by COVID-19, the Black Lives Matter movement, and unprecedented political turmoil. Understandably, many people were stretched beyond usual pressures during that time and thus we did not obtain as much outside expertise, particularly from members of communities of color, as we diligently sought over several years. We understand and accept that these limitations to our information gathering and review processes caused hurt, and for some readers compromised the integrity of the report.

As with infusing, questions arise with the processes of gathering information and with the sources of information. Who are the authors? The partners? Are sources diverse? Appropriate? Reputable? How much input and review, and by whom? If one reviewer of color is not sufficient or credible, are four reviewers? Ten? What is the nature of the review process? How do researchers best access and present the lived experience of the constituents they seek to champion?

Calling Out or Calling In?

Several months after the report's initial release and feedback, we read several articles (e.g., Ahmad, 2015) and a book by a woman of color (brown, 2020) which placed our personal experience in a larger context. Like some others commenting on current "call-out" culture, where people are publicly confronted, criticized and ostracized as toxic, adrienne maree brown describes this phenomenon of public shaming and "knee-jerk collective punishment" as "elicit[ing] a consistent and negative energy" (brown, 2020, p. 26). She laments how call-outs "humiliate people in the wake of … conflicts and mistakes. … What concerns me is how often it feels like this instant reaction is happening within the movement" (pp. 41, 43), when quick judgment and cancellation are supposed to make offenders "learn to be better," rid the movement of "bad people," and prove the bona fides of the accusers.

From our own experience, we agree with brown (2020) that "call-outs don't work for addressing misunderstandings, issuing critiques or resolving contradiction" (p. 46). Like brown and Ahmad, we agree that call-outs for egregious behavior or when other measures fail are sometimes appropriate. However, "call-ins," based on dialogue rather than public excoriating, are more likely to move us all toward transformation. We agree with brown that as a movement, we are in "dangerous territory not aligned with a transformative justice when we mete out punishments … with no time for the learning and unlearning necessary for authentic change" (p. 49). We resonate with brown's systems thinking: "How do I hold a systemic analysis and approach when each system I am critical of is peopled, in part, by the same flawed and complex individuals that I love? … If I can see the ways I am perpetuating systemic oppressions … I start to have more humility as I see the messiness of the communities I am part of, the world I live in" (p. 68).

Being shamed and ostracized for the shortcomings of our report left no space for the transformative work of asking, together with our accusers, what can we learn and how can we grow from this experience? How can we all do better at holding the complexity of the systems, situations, and relationships in which we co-exist? We feel fortunate to have colleagues who have shared and supported us in our journey, including our Discussion Team and report editors.

We deeply agree with brown (2020) that

"movements need to grow and deepen … to become the practice ground for what we are healing toward, co-creating. Movements are responsible for embodying what we are inviting our people into" (p. 57), for asking careful questions before leaping to judgment and shame. With brown, we "feel like we are responsible for each other's transformation" (p. 74). We hope these reflections make a contribution.

Good Practices

What are some good practices for white people engaged in research, analysis, and other undertakings in this time of greater racial awareness? For those seeking to advance equity and be good "co-abolitionists," borrowing brown's term, with people from oppressed communities, stumbling is inevitable. We appreciate the work of others who have similarly pondered this question. From our experience and reflection, we offer a few suggestions.

- Be clear about the purpose and scope of the endeavor, and expectations. At times, blurring the lines between scholarship and activism can contribute to food justice work (Reynolds et al., 2018).
- Be transparent about the authors' qualifications and limitations. Acknowledge the "ways that we are complicit in unjust systems and ways that we benefit from them" (Levkoe, 2021, p. 611).
- State upfront how oppression, equity, and social justice will be addressed in the material. Describe and justify the approach, which may include one or more of the strategies described above.
- Everywhere that it is appropriate in the project, lift up the historic and contemporary injustices, struggles, and successes experienced by communities of color and other oppressed groups, and at a minimum, acknowledge root and systemic causes.
- Acknowledge the challenges presented by language. Terminology evolves, and certain terms and expressions may offend some readers but not others, even within like-minded groups. "Language and terminology … are forever shifting and almost impossible to keep up with. In such a context, it is impossible not to fail at least some of the time" (Ahmad, 2015, para. 4).
- Prioritize diversity and inclusion in developing the material. Seek diverse and relevant information and partners, and explain the process used to obtain them. In our report, we drew directly from material, including policy and program recommendations, that was developed by individuals and groups of oppressed and marginalized communities.
- Employ universally accepted processes to advance knowledge and justice by inviting feedback, correction, additions, and further analyses. For example, we welcome others to comment on this report and to analyze regional food systems through the lenses of race, gender, class, capitalism, etc.
- Practice cultural humility in research and presentation. Incorporate different ways of knowing and sources of knowledge.
- Include strong values statements about oppression and equity, regardless of the topic. Be willing to step up and take action.

We have learned a lot. We understand more clearly how to employ all methods to build knowledge, increase awareness, promote dialogue, and advocate for change toward a more resilient, sustainable, and just food system for all. We know that ally work is ongoing and that it requires reflection and humility. Our experience has reminded us how crucial—and fragile—trust is. Despite missteps, we need to be in this together, in all our stumbles, hurts, *and* achievements.

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Special Section:
Fostering Socially and Ecologically Resilient Food and Farm Systems Through Research Networks

SPECIAL SECTION SPONSORED BY:

Farmer knowledge as formal knowledge: A case study of farmer-led research in Ontario, Canada

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Abstract

Farmer-led research (FLR) is a process of inquiry wherein farmers use scientific methods to address their own on-farm curiosities and challenges in ways that are compatible with the scale and management style of their operations. With its flexible, adaptable, participatory, grassroots-oriented nature, FLR has typically been employed by farmers inter-

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Declaration of Interest

The authors report there are no competing interests to declare.

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ested in ecological farming techniques and technologies, and evidence shows that it contributes to the adoption and improvement of ecological management practices across a range of contexts. Engagement in FLR initiatives has also been linked to positive social outcomes, including community-building, farmer empowerment, and enhanced capacity for leadership and collective action. In this paper, we present a case study of the Ecological Farmers Association of Ontario's (EFAO) Farmer-Led Research Program (FLRP), which is currently one of relatively few FLR initiatives in North America. We draw on data from a participatory, mixed-methods research project. Our results highlight how the FLRP is enabling farmers to feel more knowledgeable, confident, motivated, and inspired to adopt and/or improve ecological practices on their farms, in part by supporting them in building robust social networks that align with their farming values and priorities.

Keywords
Farmer-led Research, Ecological Agriculture, Farmer-to-Farmer Networks, Knowledge-Sharing, Social Learning, Evidence-Informed Practice, Ontario

Introduction

For as long as people have been farming, farmers have engaged in experimentation as a means of refining the productivity, sustainability, and quality of their farming systems. As they work through growing seasons and cycles, they test techniques and technologies, seeds and soil amendments, new innovations and traditional practices. In spite of this, conventional agricultural research and development generally positions farmers as subjects of research and/or consumers of research results, with the role of researcher reserved for those with more formal scientific credentials (Farrington, 1989; Konde, 1998).

In resistance to the dominance of expert scientific agricultural knowledge, the concept of farmers engaging in—and leading—more formalized research efforts began gaining traction in the 1990s (Waters-Bayer, 2015). Originally targeted at small-scale, resource-poor farmers in the Global South, farmer-led research (FLR) was developed as a method whereby "farmers organized in research teams were given the tools to plan and carry out randomized block design trials and replications, and to evaluate and analyze the results in a manner that was statistically verifiable…" (Humphries et al., 2015, p. 3). The knowledge generated from FLR is a public good (Braun et al., 2000) and widespread dissemination and practical application of research results is essential (Ashby et al., 2000). With its adaptable, participatory, grassroots-oriented nature, FLR has typically been employed by small- and medium-scale farmers interested in ecological techniques and technologies, and research has found that it supports the adoption and improvement of ecological management practices across a range of contexts (Humphries et al., 2015; Wettasinha et al., 2014). Engagement in FLR initiatives is also linked to positive social outcomes that include community-building, farmer empowerment, and enhanced capacity for leadership and collective action (Ashby et al., 2000; Classen et al., 2008; Waters-Bayer et al., 2015). As will be elaborated upon in this paper, the methodology has close ties to agroecology, and can serve as a strategy for supporting transitions toward more agroecological food and farming systems.

Although FLR was initially most widely practiced in Latin America, Africa, and Asia, more recently the methodology has gained traction in the Global North. Notable examples include initiatives to reduce antibiotic and pesticide use in Scottish dairy operations (Macmillan, 2017), increase cover cropping in the United States (Lenssen, 2015; Wood & Bowman, 2021), and address soil health in Canada (Hargreaves et al., 2019). Because of the relative novelty of FLR in the Global North, there is little available evidence regarding program processes, impacts, challenges, and opportunities in that context. Our research addressed this gap through in-depth analysis of the Ecological Farmers Association of Ontario's (EFAO) Farmer-Led Research Program (FLRP).

The primary transdisciplinary research network involved in this work is the EFAO itself. Founded in 1979, EFAO represents almost 1,000 members, and supports farmers in building resilient, ecological farms and growing a strong knowledge-sharing community. The organization views resilience

broadly in economic, ecological, and social terms. It envisions a future in which "thriving ecological farms are the foundation of our food system" and agriculture "protects our resources, increases biodiversity, mitigates climate change, and cultivates resilient, diverse, equitable communities" (EFAO, 2020). To achieve that vision, programming focuses on farmer-led education, research, and community-building, all aimed at enhancing farmers' ability to learn from each other in order to improve the health of their soils, crops, livestock, and environment, while running profitable farm businesses. EFAO is also involved in larger networks—for example, it was a founding member of the Farmers for Climate Solutions coalition—that advocate for policy solutions to build social and ecological resilience. Indeed, the organization strongly supports the development of a network of networks to enhance its efforts, along with those of like-minded organizations.

To conduct the research shared in this paper, the EFAO collaborated with a team of faculty and graduate student researchers from the University of Guelph. This relationship was grounded in the principles of participatory action research (PAR) and community-engaged scholarship (CES). These principles require researchers to address community-identified issues and work with local stakeholders in a spirit of reciprocal exchange, ensuring that the research endeavor is mutually beneficial for all parties and that results can be meaningfully applied (see Brydon-Miller et al., 2003; Hall, 2009). This methodological approach challenges traditional notions regarding who is perceived as a "researcher" (Reason & Bradbury, 2008) and, as such, aligns closely with the philosophy of FLR.

In the spirit of PAR and CES, the EFAO and the university-based research team co-designed the project and communicated closely throughout its development and execution. The overall project goal was to assess FLRP impacts, constraints, and opportunities. Based on our results, we argue that FLR is deeply impactful, as it enables farmers to produce knowledge grounded in both their lived experiences and traditions of more formalized scientific discovery, and to share that knowledge so that it can be applied. In so doing, the methodology supports the uptake and improvement of ecological farming practices and can support transitions to more sustainable and resilient food and farming systems.

Literature Review

The 2022 report from the Intergovernmental Panel on Climate Change notes that "land-based mitigation measures represent some of the most important options currently available" to address the urgent climate crisis (IPCC, 2022, p. 185). However, while the potential for agriculture to mitigate climate change is high, interconnected political, economic, and socio-cultural barriers act as "lock-ins" (International Panel of Experts on Sustainable Food Systems [IPES-Food], 2016), constraining a widespread transition toward ecologically sustainable food production methods (Food and Agriculture Organization of the United Nations [FAO], 2019; Gliessman, 2014; International Assessment of Agricultural Knowledge, Science and Technology for Development & United Nations Environment Programme, 2009). In this context, it is important to understand mechanisms that can encourage farmers to adopt practices such as cover cropping, minimizing soil tillage, reducing agrochemical application, integrating livestock, and conserving biodiversity.

Agroecology offers a useful framework for understanding how an ecological transition can be facilitated as, at its core, agroecology aims to transform the dominant food system away from industrial practices and toward those that foster ecological soundness, as well as economic viability and social justice (Altieri & Toledo, 2011; Gliessman, 2014; Pimbert, 2018). Defined simultaneously as a scientific discipline, a set of on-farm practices, and a social movement (Méndez, Bacon, & Cohen, 2013), one of the central components of agroecological transitions is knowledge (Altieri & Toledo, 2011; Anderson et al., 2019; Pimbert, 2018; Warner, 2006); however, Gliessman (2014) notes that "Although we have accumulated a great deal of knowledge about the ecological relationships underlying sustainable food production, that knowledge has seen relatively little application, and industrial agriculture has meanwhile strengthened its dominance of the world food system" (p. 14) This raises questions regarding what kinds of

knowledge, knowledge-generation, and sharing processes are most likely to translate into the pursuit of agricultural transition.

Knowledge (Co-)Production and Social Learning Networks

In the conventional agricultural paradigm[1] knowledge produced by professionally trained experts drawing on western scientific traditions plays a dominant role (Carolan, 2006; Sumane et al., 2018). Such knowledge focuses heavily on increasing agricultural productivity to the exclusion of other (socio-cultural, ecological) concerns (Ingram, 2008). By contrast, agroecology is associated with more holistic, locally grounded, experiential, and traditional knowledge held by farmers (Altieri & Toledo, 2011; Anderson et al., 2019; Rosset et al., 2011). While these two types of knowledge are often conceptualized as being in opposition to each other, Sumane et al. (2018) note there is "an increasing body of research that tells another story, that of the complementarity of informal farmer and formal scientific knowledge, and points to the necessity of combining them to achieve the best results and meet sustainability goals" (p. 235). In challenging this formal/informal dichotomy, and its implied hierarchy, farmer knowledge can be viewed without the "informal" label that has been, and continues to be, used by some to devalue it. This perspective aligns with other research that suggests agroecology is best supported by knowledge that is co-produced through collaboration, negotiation, and exchange among diverse actors, including farmers and scientists (Carolan, 2006; Humphries et al., 2015; Pimbert, 2018).

If knowledge co-production is an essential component of supporting agricultural transformation, so too are knowledge-sharing processes grounded in social networks and social learning principles (Kroma, 2006; Sumane et al., 2018; Sutherland et al., 2017). As Schneider et al. (2009) explain, "The social learning approach represents a philosophy focusing on participatory processes of social change" (p. 496). Such participatory approaches are actualized by networks wherein farmers are "active partners and knowledge co-producers rather than passive receivers" (Sumane et al., 2018, p. 235). Arguably, "agroecology can be effectively put into action only when networks of farmers and scientists learn together [emphasis added] about the local ecological conditions. Agroecology cannot be 'transferred' in the way that a chemical or a mechanical technology can; it must be facilitated by social learning…" (Warner, 2006, p. 3). Such networks stand in contrast to mainstream agricultural extension processes that, to the extent they still exist, are typically characterized by top-down, unidirectional knowledge flows and inattention to power dynamics, local conditions, political economic context, and farmers' lived experience (Cook et al., 2021; Ingram, 2008).

Farmer-Led Research

Farmer-led research represents one mechanism through which agricultural knowledge co-creation and network-based social learning can be operationalized. The core of the methodology is to encourage active collaboration between farmers and scientists to enable the co-production of knowledge. While farmers drive the agenda, "scientists can play an important role by sharing their knowledge and skills, building farmers' capacity in certain aspects of experimentation, helping farmers understand why something works or not, documenting and sharing what farmers are doing and validating innovations in scientific terms to increase credibility in the formal [agricultural research and development] sector" (Waters-Bayer et al., 2015, p. 5) and enhancing the potential for results to influence policy. The collaboration among farmers and, in many cases, between farmers and other researchers that is facilitated through FLR is often supported by nongovernmental organizations (NGOs) and other civil society organizations and has been shown to enhance social cohesion and enable collective action (Classen et al., 2008; Wettasinha et al., 2014).

[1] By this, we refer to agriculture grounded in industrial principles and practices, including industrial-scale production, monocrop systems, heavy reliance on chemical fertilizers and pesticides, and a general tendency toward external inputs rather than on-farm production and recycling (see IPES-Food, 2016).

The increased capacity for collective action fostered through FLR can be used to many ends; however, a central goal is to drive the adoption of ecological farming practices, in part by increasing farmers' capacity to make evidence-informed decisions regarding sustainable farm management (Braun et al., 2000). As Humphries et al. (2015) explain, "Involving farmers as protagonists of their own agricultural research agendas is one means of permitting continual innovation, allowing the moving target of sustainability to be kept continually in the 'crosshairs' of local people" (p. 2). This is borne out by research on FLR initiatives. For example, a Honduras-based study found that a majority of participants in an FLR program improved the ecological integrity of their agroecosystems, for example by increasing on-farm biodiversity (Classen et al., 2008). In Cuba, FLR was found to contribute to crop diversification, economic improvements, increased adoption of locally adapted seed varieties, and increased use of integrated pest management (IPM) to reduce agrochemical application (Ortiz Pérez, 2013), and Wettasinha et al. (2014) found that farmer-researchers' farms were more resilient to the impacts of Hurricane Mitch in 1998. Similarly, in Scotland, FLR efforts have reduced antibiotic use in dairy production as well as pesticide applications (Macmillan, 2017), while in Iowa they contributed to significant increases in cover cropping (Lenssen, 2015).

Farmer-Led Research in Ontario, Canada

As in other jurisdictions, adoption rates of ecological farming practices (e.g., cover cropping, compost application, biodiversity conservation, reduced tillage, livestock integration, minimizing agrochemical application) in Ontario, Canada, remain relatively low (Ontario Ministry of Agriculture, Food and Rural Affairs [OMAFRA], 2018; Rotz et al., 2019). While the province's Ministry of Agriculture acknowledges the importance of encouraging a greater uptake of ecological practices, extension services that could support that work have been almost non-existent since the 1990s, leaving most agricultural advising to industry-embedded crop advisors (Milburn et al., 2010). Even when extension services were more readily available, they were generally not well-aligned with the needs of ecological farming (Milburn et al., 2010), and support for ecological agriculture has typically been left to NGOs and farmer networks (Isaac et al., 2018).

In 2016, one such network (EFAO) received funding from the Ontario Trillium Foundation to begin its Farmer-Led Research Program (FLRP) with 11 participating farmer-researchers. The program was the first—and at the time of writing, still the only—one of its kind in Ontario. By 2022, it had supported more than 80 farmers in conducting more than 125 scientific trials on their farms. These farmer-researchers received a CA$250-$500 stipend, depending on project scope, and the program also provided them with up to CA$1,500 for research expenses. The FLRP emphasizes the cultivation of a "culture of curiosity" among farmers, for example, by framing its yearly call for proposals as a "call for curiosity" that centers the idea of helping farmers find answers to their "burning on-farm questions and challenges." A research advisory committee selects projects to support, and EFAO staff work with farmer-researchers to develop and implement their research and share the results (see Figure 1).

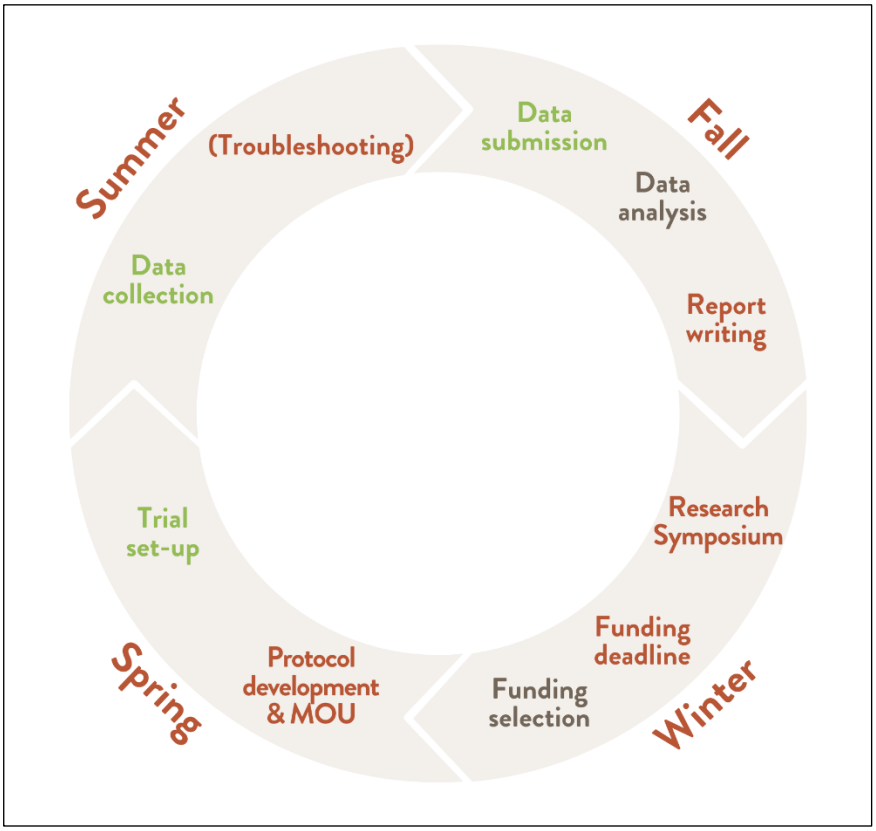
Projects fall into the following categories: alternative livestock feed; cover crops; disease and pest control; livestock breeding; nutritional quality; pasture regeneration; pollinator services; seed selection, production, and breeding; soil health; and weed control. One notable project was the Southern Ontario Pepper Breeding Project, which involved a collective of five farmers who, informed by consumer demand, bred an open-pollinated, early, blocky, sweet red pepper with good flavor that was adapted to ecological growing systems. After five years of research trials, the group commercially released the "Renegade Red" pepper under the Open-Source Seed Initiative. In another example, a farmer-researcher conducted randomized complete block design with five replicates to compare the planting of no-till spring cereal grain into four winter-killed cover crops with a fall tillage control. In that case, findings demonstrated that no-till planting into daikon radish was best for grain yields, soil health, and net return on investment.

Methods

In alignment with the action-oriented, community-engaged methodology outlined in the introduction, the starting point for our research was a series of informal conversations between the lead researcher and EFAO's executive and research directors, both of whom were interested in formally investigating their FLRP to better understand its impacts, limitations, and opportunities. As it took shape, the project maintained a participatory approach, with the research team collaborating closely with EFAO during research design, data collection, and analysis. The first step in the research process was a series of workshops held between September and December 2019. Through these workshops, EFAO representatives and the research team collaboratively clarified connections among FLRP activities, goals, and expected short-, medium-, and long-term impacts, developing a program logic model that was then vetted by the EFAO board of directors. In addition to the logic model, several priority research themes were identified during the workshops: farmers' social networks; existing farm practices; stories of changing farm practices; knowledge, motivation, and confidence regarding ecological practices; risk perception and tolerance; and personal experiences with the FLRP and its project results.

The research team used the logic model and priority research themes to develop a 34-question online survey (see Appendix A), which included questions regarding current, past, and future use of ecological management practices; knowledge, motivation, and confidence in ecological practices; barriers to ecological practices; social networks; and how each of these areas was influenced by various types of involvement with the EFAO. The EFAO distributed the survey via its listserv[2] on multiple occasions. Between February and September 2020, 139 responses from across Ontario were recorded. Survey respondents were invited to volunteer for a follow-up semi-structured interview designed to gather more in-depth information about engagement with and opinions regarding the FLRP. Volunteers were randomly selected and a total of 17 were interviewed between November 2020 and April

Figure 1. Cycle of Ecological Farmers Association of Ontario's (EFAO) Farmer-Led Research Program Outlining Responsibilities for Farmers (Green), EFAO Staff (Brown), and Farmer-Researchers Together with EFAO Staff (Red)



Source: EFAO

[2] At the time of survey distribution, the listserv included 2,877 individual contacts, of whom approximately 1,000 were EFAO members eligible to complete the survey.

2021. The interviews took place via Zoom or telephone and had a duration of approximately one hour. They included questions about the participants' farming practices, their engagement with the FLRP, the impacts of and limitations to that engagement, and any recommendations for improvement (see Appendix B for the interview guide). Data from the interviews will be cited in this paper using participant identification numbers (e.g., EFAO01). Data from interviews and the preceding survey were supplemented by an online focus group discussion held with six FLRP participants in March 2021 (see Appendix C for the focus group discussion guide). Those participants were people who had expressed interest in an interview—separately from volunteering via the survey—as well as FLRP leaders identified by the EFAO.

Participant Profile

Of the 139 EFAO members who completed the survey, most (58%) had been farming for 10 or more years, while 20% had less than five years of experience. A majority (73%) reported growing fruits or vegetables, less than half (44%) raising livestock, and one-third (33%) growing field crops. A small number (11%) produced seeds, while even smaller numbers reported producing eggs, milk, herbs, trees, flowers, oilseed, honey, wheat, maple syrup, and nursery plants. Approximately one-quarter of respondents (26%) were long-time EFAO members (10 or more years), while 41% had joined the organization in the preceding one to five years. Respondents reported engaging with the EFAO in a variety of ways, including via its print and electronic newsletters, annual conference and research symposium, and web-based resources (including research reports from the FLRP). Thirty respondents (21%) identified themselves as farmer-researchers in the FLRP.

Of the 17 survey respondents who participated in an in-depth, semi-structured interview, six had engaged with the FLRP as farmer-researchers conducting at least one on-farm research project. Of the remaining nine participants, seven indicated that they engaged with FLRP projects through the EFAO website, conversations with peers, by participating in farm tours and, in almost all cases, by attending sessions at the organization's annual conference and research symposium. With the exception of website use, these activities enabled members to not only receive knowledge regarding FLRP project results, but to actively engage in conversations about how results were generated, and how they might be able to adapt and apply them on their own farms. Interviewees' years of farming experience ranged from two to 50, and the scale of operations ranged from one to 350 acres. Their farming systems included market gardens, flowers, cash crops, vegetables, oilseed, dairy, and livestock. In the case of the focus group discussion, all six participants had been actively involved in the FLRP as farmer-researchers conducting at least one on-farm trial.

In addition to their ecological orientation, there are some notable differences between the EFAO member population and the general Ontario farming population. There is a tendency toward smaller farm sizes, with EFAO members farming a median of 12 acres (EFAO, 2021), compared to the 243-acre provincial average (OMAFRA, 2021). In addition, while provincewide 31% of farm operators identify as female (Chen, 2022), 56% of EFAO members are women (EFAO, 2021). The EFAO population also skews somewhat younger, with 65% of members under the age of 55 (EFAO, 2021). By contrast, just 38% of all Ontario farmers are under 55 (Chen, 2022).

Results and Discussion

Increasing and Improving the Use of Ecological Farming Practices

Survey results demonstrated a distinct connection between engagement with EFAO and its FLRP and farmers' confidence, motivation, interest, and ability to adopt and improve upon ecological practices (Table 1). Approximately three-quarters of respondents indicated that the EFAO helped them improve their knowledge regarding ecological soil health practices (77%) and increased their motivation (74%) and confidence (74%) to employ such practices on their farms. A majority also reported that the EFAO introduced them to ecological innovations (72%) and helped them improve upon ecological practices they already employed (68%).

Table 1. Impact of Ecological Farmers Association of Ontario (EFAO) on Farmer Relationships with Ecological Soil Health Practices (*n*=139)

Impact	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Improved knowledge	2%	5%	9%	37%	40%
Increased motivation	2%	4%	14%	32%	42%
Increased confidence	3%	3%	14%	37%	37%
Introduced to new innovations	2%	6%	13%	31%	41%
Helped improve existing practice	4%	4%	17%	36%	32%
Helped adopt new practice	2%	7%	25%	35%	24%
Helped support other farmers adopting ecological soil health practices	5%	8%	32%	32%	17%
Helped access resources to adopt ecological soil health practices	8%	12%	42%	21%	10%

Although the survey looked at the whole EFAO, rather than specifically the FLRP, some conclusions can still be drawn regarding FLRP influence. Firstly, all of the ways in which survey respondents reported engaging with the organization have some connection to the FLRP. While only 21% of respondents participated directly in the FLRP as farmer-researchers, 78% attended the annual conference and research symposium where FLRP results are shared, and 74% participated in farm tours or workshops, which highlight FLRP projects. In addition, in response to an open-ended question asking participants to specify how EFAO activities impacted them, the most referenced activity was the annual conference and research symposium, followed closely by the FLRP. While receiving knowledge gleaned through the FLRP is different from engaging directly in its production, it is clear that the program permeates the organization and impacts even those members who may only peripherally engage with it. One member acknowledged that, while they themselves did not have the capacity to serve as a farmer-researcher, they still felt included in the broader culture created through the program: "that [FLR] culture, it's just so approachable, and honestly I so look forward every year to the conference that the EFAO holds; it's a highlight of my year" (EFAO05). They went on to explain: "I get inspiration from the fact that there's farmers who are taking their own time and applying themselves in that way for the collective betterment of our community, our movement. … I really admire those people who are able to and excited to do that."

Farmer-researcher survey respondents were more likely to "strongly agree" with statements about EFAO impact than those who engaged with the organization in other ways (Table 2).

This difference was especially notable when it came to increasing motivation and confidence to use ecological practices, improving upon and adopting ecological practices, and supporting others in adopting ecological practices. For example, 14 of the 30 farmer-researcher respondents strongly agreed that the EFAO helped them adopt new ecological practices, compared to one-fifth of other respondents, and 24 of the 30 farmer-researcher respondents strongly agreed that the EFAO had increased their motivation to use ecological practices, compared to 35% of other respondents. While the sample size is too small to make causal conclusions, the extent to which farmer-researcher responses consistently differed from the rest is noteworthy, warranting further research to understand the complex relationship between the FLRP, the ways in which different farmers engage with and are impacted by it, and factors that influence such differentiation.

Data Quality and Reliability

Research showed that the FLRP significantly enhanced perceptions regarding the quality and reliability of on-farm data collection. Interview and focus group participants (farmer-researchers and

Table 2. Farmer-Researcher (*n*=30) and Other Respondent (*n*=109) Assessment of Ecological Farmers Association of Ontario (EFAO) Impacts on Ecological Farm Practice

Impact	Farmer-Researchers who "Strongly Agree"	Others who "Strongly Agree"
Improved knowledge of ecological practices	69%	35%
Increased motivation to use ecological practices	83%	33%
Increased confidence in use of ecological practices	72%	30%
Introduced to new innovations in ecological practice	69%	37%
Helped improve upon ecological practices already in use	61%	27%
Helped adopt ecological practices	48%	20%
Supported other farmers in adopting ecological practices	41%	11%
Helped access resources to use ecological practices	21%	8%

other EFAO members alike) drew a clear distinction between informal on-farm experiments and FLRP research projects. While the former is certainly valuable, participants associated the latter with higher levels of rigor in research design and execution. Thus, they perceived results as much more reliable than the "lousy quality, un-replicated data" that one focus group participant described themselves collecting outside the FLRP structure. Another farmer-researcher clarified the distinction:

> [The FLRP] was really important for us because I think we're experimenting all the time on the farm, but we're often not very rigorous. … I think sometimes you don't really go through meticulously to ensure that the results you're getting are significant and good enough that you want to actually change your practice. (EFAO13)

The increased rigor and reliability associated with FLRP data was in part connected to the program's focus on training farmers in scientific research methods (e.g., randomized control trials) and providing ongoing mentorship and support. In the words of one focus group participant, the program "[makes] the whole process of asking and trying to answer questions on the farm something more solidified and more formal." Several farmer-researchers referenced the "discipline" inherent in FLR, expressing appreciation that the program kept them accountable to the data collection and recording process, ensuring they maintained consistency even as other on-farm priorities competed for their time, resources, and attention. For example:

> It was just having that forced discipline to do all those [data collection and record-keeping] steps. Whereas when it gets really busy on the farm it's easy to cut corners and let things like that slide, because we had [the FLRP Director] sending us emails saying, "I need your data! I need your data!," you stay on top of it. (EFAO13)

A focus group participant further explained:

> Part of [what makes the FLRP successful] is just the discipline of, well we said we were going to do this, we have funding for doing this, and now we actually gotta collect the data every week. … It's just that consistently keeping that amount of data, it takes a chunk out of your week … [and] actually follow[ing] through for the entire season. … I know that it's good to keep that sort of data for myself, but … whether I actually would do it [without the FLRP] … the answer is usually no.

The distinction participants made between the rigorous, replicable, "disciplined" knowledge produced via the FLRP and their more intuitive, experiential knowledge mirrors agroecology discourses regarding how different knowledges are valued (Gliessman, 2014; Sumane et al., 2018). The value

that participants ascribed to the "meticulous" application of scientific methods echoes findings from Honduras, where the success of a farmer-led plant-breeding initiative was closely tied to developing farmers' scientific research skills (Humphries et al., 2015; Wettasinha et al., 2014). However, a review of 11 FLR projects in Africa, Asia, and Latin America found that, in most cases, "more emphasis was given … to generating a strong and broad spirit of experimentation and adaptation to explore new possibilities than to perfecting farmers' research skills" (Wettasinha et al., 2014, p. 37). This echoes the EFAO's emphasis on building a culture of curiosity that extends beyond farmers directly engaged in FLRP trials. It suggests the context within which the FLR is being conducted, along with the focus of the research and the intended audiences, are important factors in determining the extent of scientific rigor required to lend credibility to project results.

Evidence-Based Decision-Making

Many of the interview and focus group participants drew a connection between the high-quality data produced through the FLRP and their ability to feel confident making evidence-based decisions on their farms. This was particularly true with respect to adjusting existing practices or adopting new ones. The willingness to actively apply FLRP results is consistent with research on FLR in other contexts, where the methodology has been shown to increase farmers' capacity to make effective, evidence-informed decisions regarding sustainable farm management (Braun et al., 2000; Humphries et al., 2015; Waters-Bayer et al., 2015).

In discussing a research project that assessed yields for different varieties of tomatoes, including grafted plants with different root and top stocks, a focus group participant explained how the FLRP enhanced decision-making about on-farm practice: "Spending a couple of years of collecting solid data … it's taken a lot of guessing out of stuff." Another farmer shared how involvement in the FLRP enabled them to confidently invest the required resources to shift to a no-till operation:

> We had read a lot and talked to other farmers about using tarps to kill weeds and stubble and to replace tillage, and in order to convert our whole farm to no-till we're talking about probably a [CA]$20,000 investment in material. And we needed a process to figure out what was the best material to use, how we're going to do it…before we made that investment. So, the farmer-led research project helped us get the rigor to actually see… to go through the process for two complete seasons to figure out exactly what worked best for our operation and then, when we made that investment, we were totally confident that we had exactly the right stuff. (EFAO13)

As this example demonstrates, farmers must always weigh the potential benefits of a new or adapted practice against the resources (e.g., time, capital, materials) they would need to invest and the potential risks (e.g., yield losses) involved in adoption. Because perceived risks can deter action, simply possessing knowledge about ecological farming practices does not necessarily translate into their adoption (Kroma, 2006). One research participant highlighted how the FLRP helps farmers better make these complex calculations, mitigating the risk that is often cited as a barrier against adoption of ecological practices:

> I would say [the FLRP] has made me feel less worried [about the potential risks of changing practices] in the sense that when you see people doing it and you see the result. … Most of the risk in wanting to switch to a different [best management practice] or a [best management practice] that you're not currently using, usually it's financial, you don't want your yields to plummet, you want your farm to succeed and continue to thrive. … I would say that [seeing FLRP results] has given me confidence that as we [adopt a new practice] we can transition, and things will be just fine coming out the other side. (EFAO7)

This aligns with work by Waters-Bayer et al. (2015), which found that engagement with FLR was connected to, among other things, "the capacity of individuals and communities to continuously identify and prioritize problems and opportunities

in a dynamic environment; the capacity to take risks, experiment with social and technical options, and assess the trade-offs that arise from them…" (p. 3).

The kind of evidence generated by FLR is particularly crucial for enabling effective decision-making, because much of the widely available data designed to help farmers make management decisions is not geared toward ecological or smaller-scale operations (Carolan, 2006; Sumane et al., 2018). Many participants discussed the difficulties they had finding data that was relevant to, for example, their varieties or breeds, the inputs they wanted to use, or the overall approach they wanted to take with their farming. A focus group participant described this challenge:

> You can talk to a hundred experts, and nobody has a darn clue what you're talking about because nobody's actually done this research. … If I want to know in conventional production how much it costs to raise a kilo of chicken, there's so much benchmarking information out there. But for ecological, pasture-raised chicken, nobody knows. … We all have a general sense of what it might cost on our farms but, even there, the effort that I've put into writing my own spreadsheet versus the effort I think it deserves and would get if I had to do it, and had that sort of organizational support behind me, would be just two entirely different things.

Similarly, participants stressed that the location-specific nature of FLRP data, when compared against the more standardized, generalized, "reductionist" (EFAO01) information typically available through extension sources, rendered it especially trustworthy and relevant to them.

One response to a dearth of ecologically focused, context-specific agricultural data has been a strong reliance in agroecological circles on local or farmer knowledge (Carolan, 2006; Gliessman, 2014; Pimbert, 2018). However, many smaller-scale or ecologically oriented farmers—including participants in this study—still express a desire to access complementary scientific evidence to bolster confidence in their decisions (Carolan, 2006; Waters-Bayer et al., 2015). To some extent, they are looking for a kind of extension service (many participants expressed dismay about the loss of public extension services in Ontario), but the dominant model —with its emphasis on decontextualized, one-size-fits-all information focused on maximizing productivity through industrial methods and inputs—does not meet their needs. Rather, they would be better served by something akin to Cook et al.'s (2021) notion of a "humanized extension," with its attentiveness to power, place, and people, and emphasis on farmers' socio-spatial contexts and lived realities.

In the case of the FLRP, such farmer-centeredness was key to farmers' willingness to use project results to inform practice. While, as discussed above, the application of formal scientific methods was perceived as enhancing the reliability of the data, the farmer-led nature of the program meant that results were perceived as more relevant, accessible, and trustworthy than information from more conventional sources. This is consistent with findings regarding FLR in locations such as Honduras (Humphries et al., 2015), where collaborative interaction between farmer-researchers and formal research experts was central to program success. As one participant, who was not themselves a farmer-researcher, explained,

> [Other sources are] very formal, very top-down, no nuance necessarily. I find that much harder to interact with, where someone doesn't actually know my farm, doesn't know the intricacies of what I do, it's just a blanket approach... I find that I don't connect to that style of information as much. (EFAO5)

Another participant highlighted the conflict of interest associated with industry-led or funded science as a way to explain why they had more trust in FLRP data: "[The FLRP] works with the interests of the farmers. It's not something [the researchers] are trying to sell to the farmers or promoting to the farmers; this is a program that comes from farmers' interests." These farmers underscore some of the shortcomings of mainstream extension models as described by Cook et al. (2021). At the same time, their interest in scientifically grounded knowledge

developed through farmer-led processes aligns with arguments regarding the centrality of knowledge co-production as a means of achieving agricultural sustainability (Carolan, 2006; Pimbert, 2018; Sumane et al., 2018).

Strengthening Networks and Fostering Community

As noted, it is not just the quality of available knowledge that is important for supporting transitions toward agroecology, but also the processes used to share that knowledge (Gliessman, 2014; Sumane et al., 2018; Sutherland et al., 2017). Research participants were keenly aware of this, frequently highlighting how, as in other contexts (see Waters-Bayer et al., 2015), network-based, farmer-led knowledge-sharing embedded in relationships of trust was central to FLRP success: "Having your friend tell you, 'This is what we did, and this is the origin, and this didn't work. ...' This is the best way to learn. The important thing about that, I think, it's trust" (EFAO17). Another participant noted the importance of trust in describing their attendance at the annual research symposium where FLRP results are shared: "The culture of coming together, sharing, exchanging, building this face-to-face interaction, it builds a really strong level of trust and cohesion" (EFAO05). That trust and sense of belonging to a supportive, cohesive community play a key role in helping farmers work through the risks associated with increasing and improving their use of ecological practices, particularly in a context that requires continuous adaptation (Gliessman, 2014; Kroma, 2006).

In addition to drawing upon networks and relationships of trust for its success, the FLRP helped foster such connections, as farmer-researchers were considerably more likely than their fellow EFAO members to feel that the organization improved their connectivity with other farmers, farmer mentors, the broader farm sector, and even their consumers (Table 3). These connections could be defined as social capital—that is, the relationships of trust that facilitate feelings of shared identity and capacity for collective action (Ostrom & Ahn, 2009)—which has been identified as important for FLR success (Wettasinha et al., 2014) and, more generally, for the effective spread of ecological farming practices (Isaac, 2012; Kroma, 2006; Prokopy et al., 2019). Participants drew direct comparisons between the network-based, peer-to-peer social learning approach of the FLRP and more conventional mechanisms for agricultural information-sharing. For example:

> The FLRP is farmers] learning from each other. Not just some expert at the front of the room or leading the parade with a microphone through the fields.… People are sharing from their own experience, which is useful for the person who it's being shared with and also validating for the person sharing it.… It encourages people to be open to trying out new things. And it also, I think, creates a situation where [people] see themselves as being part of something. (EFAO14)

Similarly, a focus group participant explained that FLRP evidence felt more readily accessible, and thus usable, than data from conventional sources because of its relational nature: "There's a database that people can look towards that doesn't

Table 3. Farmer-Researchers' (*n*=30) and Other Respondents' (*n*=109) Assessment of Ecological Farmers Association of Ontario's (EFAO) Impact on Social Networks

Impact	Farmer-Researchers that "Strongly Agree"	Others that "Strongly Agree"
Improved connection to other farmers in area	59%	24%
Improved connection to other farmers across Ontario	86%	32%
Improved connection to farmer mentors and advisors	69%	17%
Improved connection to broader farming sector	52%	22%
Improved connection with customers	21%	6%

feel too institutional. Like you can probably reach out with an email to the person that did that research."

Importantly, the FLRP did not just support connectivity among like farmers (i.e., those in the same region), but also across various groups. One focus group participant offered a practical illustration of the importance of these boundary-crossing ties:

> We've started using deep wood chip mulch on a few different things and I wouldn't have had the nerve to do that if I hadn't have read somebody's research project out of California where they were tilling large quantities of wood chips into their soil and still finding that they could get good yields. So, I like to think that whatever I do might have that sort of impact for somebody else, whether it's in Ontario or far beyond; it's the collective sharing of knowledge that's important.

Such connectivity across space and place is arguably of special importance for fostering uptake of ecological farming innovations (Isaac, 2012).

The relationships drawn upon, built, and strengthened through the FLRP motivated and inspired farmers to strive for on-farm improvement and mitigated the associated risks. This was effective with respect to ecological practice adoption and also was perceived as deeply meaningful on a personal level. In the words of one focus group member:

> The idea of maybe being something a little bit bigger, just part of the collective whole of information that's going to be available that is useful beyond just ourselves. … It gives us … a dab of validation; like our questions are not stupid questions; there's other people that would love to hear the answers. So that kind of bolsters us up a little bit, makes us say "let's try to make our answers as useful to others as we can."

Such feelings extended to members of the FLRP audience as well, with a research participant who did not themselves conduct FLR describing their reaction to learning about program results via a farmer-led workshop: "It was … really important to have this connection to the community through these citizen scientists … and to find out what they're doing. It is incredibly powerful and inspiring to see and hear their stories" (EFAO11). These perspectives echo findings on the powerful nature of peer-to-peer social learning, particularly in the context of ecological farming systems (Kroma, 2006; Pimbert, 2018; Sutherland et al., 2017; Wettasinha et al., 2014).

Facilitating Communication About Ecological Agriculture

Farmer-researchers almost unanimously described a sense of pride in their role as formal knowledge producers and expressed a desire to communicate research results to the widest possible audience. One focus group participant explained:

> I would also like to be able to share what we do on that kind of broader scale … whether it's farmers' markets or whatever platform that I get to see other growers face to face. … We love doing this and so we love talking about it, the same as researchers in other fields. … As soon as we learn something, the next thing we want to do is tell someone.

Another added: "I'm just really happy to talk to anybody, whatever kind of farmer or person they are, about [the FLRP]. … It's a fun conversation and I think it is a less fraught and more constructive conversation to get into with a conventional operator than [some other topics]." Yet another described how the FLRP connected farmers with varied ideological positions: "I think there seems to be some success in bringing together farmers with different viewpoints, which is good" (EFAO4).

Beyond facilitating conversations with neighbors and peers, the FLRP created a platform for communicating about the benefits of ecological farming methods with a variety of audiences, including conventional farmers, consumers, and the broader public. One focus group participant discussed how they use FLR as a conversation-starter: "It's a more constructive conversation,

instead of just going directly into ecological agriculture, you talk about the role of the farmer as a researcher and start from there. Being the farmer is the key element in this, more than the ecological part of it, so it's a great tool." Another explained how the high-quality data produced by FLRP projects contributes to those productive bridge-building conversations:

> [The FLRP] allows you to cross boundaries, because once you know the numbers behind your soil organic matter and things like that you can start having conversations. … It [gives] you a good grounding to have conversations that aren't divisive, because we may be the ecological farmers, but the environment is a big and growing concern for everybody in agriculture even if they're following a conventional method. So, with that grounding behind you, you can have those conversations that just don't have the same division.

Partly in response to this finding, the public-facing report (Nelson, 2022) presenting the research results included, among other things, a call to Ontario's Ministry of Agriculture, Food and Rural Affairs to support pilot FLR projects in farm organizations beyond the EFAO, including those with more conventional orientations.

FLR's potential as a platform for discussing ecological agriculture outside self-identified ecological farming circles has not been significantly featured in research to date, which has instead more strongly emphasized impacts related to farmer livelihoods (e.g., food security, poverty reduction), along with equity considerations (e.g., gender inclusivity, farmer empowerment) (Classen et al., 2008; Humphries et al., 2015; Waters-Bayer et al., 2015; Wettasinha et al., 2014). The issue has also not been prominent in discussions about knowledge co-creation, social learning, and ecological farming practices, which have tended to focus on networks of farmers already interested in pursuing agricultural transitions focused on sustainability (Carolan, 2006; Kroma, 2006; Sumane et al., 2018). That said, Classen et al. (2008) found that farmers not directly participating in an FLR initiative still showed evidence of adopting new ecological techniques when a program was operating in their region. Combined with the findings from our study, this suggests it would be worthwhile for future research to consider how FLR could mobilize knowledge and catalyze the adoption of ecological farming practices among a broader cross-section of farmers.

Challenges and Limitations

As is the case with FLR in other geographic, socio-economic, ecological, and cultural contexts, the FLRP faces challenges. The program is constrained by available funding and other resources, including farmer time and labor, land, and other materials required to conduct research. In addition, because of the location-specific nature of many FLRP projects, generalizing results across diverse farming contexts is difficult. Multi-farm trials are being used to address this issue; however, the extent to which they can be conducted is limited by resource availability. Such issues are consistent with FLR initiatives in other contexts, where programs often depend on support from donors and civil society organizations (Waters-Bayer et al., 2015) and the scaling up and out of specific innovations developed through FLR often prove challenging (Wettasinha et al., 2014).

Some of these challenges represent trade-offs. For example, the time-intense nature of FLRP projects was a barrier to participation for some farmers—underscoring concerns raised by Wettasinha et al. (2014) about equity issues in FLR—but also contributed to the high quality of the data produced. Similarly, the specificity of the research did not lend itself well to generalization but did mean results were more highly relevant to some audiences. Research participants were keen to build new partnerships—for example, through collaborations with formal research institutions and other farm organizations—as a means of addressing program limitations and expanding the reach of their work. This is consistent with discussions regarding how to scale FLR up and out, such as through pursuing opportunities to institutionalize the methodology via policy, civil society organizations, and farmer networks (Waters-Bayer et al., 2015; Wettasinha et al., 2014). The notion of embedding FLR within institutions as a means of scaling impacts up and

out is an important consideration for future research, as is analysis of equity issues, more explicit comparison of FLR programs in the Global South and North, and further exploration of how FLR might foster connections among different types of farmers.

Conclusions

> [FLRP] research is representing a sector of the food economy that is not represented by research done in other places. … I think it becomes even more important that this [ecological farming] sector becomes represented when we're talking about what could [our future] food system look like, because if more local food or smaller farms or more ecological farms need to be part of that future picture, then we have to know what that looks like, how we get there, and we have to have the numbers to back that up as to why it's beneficial. So, we potentially have a major role to play going forward. (Focus Group Participant)

The words of this farmer-researcher circle back to this paper's opening, which highlights the urgency of transforming food and farming systems to enhance their resilience in the face of climate-related (and other) crises. While no single strategy, on its own, will achieve transformation, the results shared here demonstrate that farmer-led research can and does catalyze adoption of and improvements to the kind of ecological farming practices that are associated with agroecosystem resilience. Ontario farmers who engaged both directly (as farmer-researchers) and indirectly (as audience for farmer-researcher results) with the EFAO's FLRP increased and improved their use of ecological farming practices. This occurred as they were able to access high quality data that were relevant to their farming systems and use the data to make evidence-informed decisions about on-farm change. The risks typically associated with such change were mitigated by the data themselves and by the strong social networks through which that data were shared. Belonging to these networks, which were also strengthened by the FLRP, was a source of motivation, confidence, inspiration, and pride for many farmers, as they worked individually and collectively to create improved farming systems.

In a 2006 paper discussing co-production of knowledge for sustainable farming, Carolan asks, "How can we retain the concept of 'expertise' while allowing greater epistemic diversity to enter into the decision-making process?" (p. 422). This question is echoed in agroecological debates over the role that can and should be played by knowledge produced through formalized scientific methods and that which is produced through more localized, experiential processes. A growing consensus suggests that the most effective way to facilitate agricultural transition is through the co-production and relationship-based exchange of knowledge that simultaneously draws on the strengths of scientific methods and on farmer expertise and networks (Gliessman, 2014; Pimbert, 2018; Sumane et al., 2018), while acknowledging that balance will look different in different contexts (Isaac et al., 2018). The research presented in this paper underscores how farmer-led research can serve as a mechanism to enable such co-production and participatory exchange. For research participants, the knowledge produced through the FLRP was simultaneously farmer knowledge and formal knowledge, and thus imbued with the benefits of each. The knowledge-sharing and application process strengthened the bonds of trust across significant distances and enabled farmers to feel part of "something bigger" than themselves. FLR, then, could be considered an effective strategy to enact agroecology as, at once, a scientific discipline, a set of farming practices, and a social movement.

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Appendix A. Online Survey Questions

Thank you very much for agreeing to participate in this survey! It should take 20-30 minutes to complete. If there are any questions that you feel uncomfortable answering, or do not feel apply to you, feel free to skip them.

It is our hope that the information we collect will help improve the quality of future programming designed to support adoption of soil health best management practices.

What do you produce? Please select all that apply.

- Field crops
- Fruits and/or vegetables
- Livestock
- Seed
- Other (please specify)

How many acres do you have in production?

- Total
- Owned
- Rented

How long have you been farming?

- Less than 5 years
- 5-9 years
- 10-19 years
- 20+ years

For each of the following management practices, please select the description that best fits for you:

- Cover crops
- No-till
- Minimum tillage/conservation tillage
- Compost use
- Livestock integration
- Managed rotational grazing
- The 4Rs of fertilizer use
- Crop rotations (3+ crops)
- Keeping soil covered over winter
- Other _____

Options for each practice

- Have practiced for more than two years
- Started practicing in the past two years
- Planning to practice in next year
- Considering practicing in the future
- No plans to practice
- Practiced previously and stopped
- Other _____

Are you a member of the Ecological Farmers Association of Ontario (EFAO)?
How long have you been a member of the EFAO?

Less than 1 year
1-5 years
5-10 years
10+ years
Not sure

What is your relationship to EFAO? Please select all that apply.

I have attended a farm tour or workshop
I have used the Advisory Service
I have attended the EFAO Conference and/or Research Symposium
I have conducted farmer-led research
I have used online resources on the EFAO website
I have read the printed EFAO newsletter and/or the e-news
Other (please specify) _____

How has your involvement with EFAO changed your personal network?

Being a member has improved my connection to other farmers in my area
Being a member has improved my connection to other farmers across Ontario
Being a member has improved my connection to farmer mentors/advisors
Being a member has improved my connections in the broader farming sector
Being a member has improved my connections with my customers

Rate agreement (strongly disagree - strongly agree)

How has your involvement with EFAO impacted your relationship to soil health best management practices?

Being a member has improved my knowledge of soil health best management practices
Being a member has introduced me to new innovations in soil health best management practices
Being a member has increased my motivation to use soil health best management practices
Being a member has increased my confidence to use soil health best management practices
Being a member has helped me access the resources (e.g., financing, equipment, seed) to use soil health best management practices
Being a member has helped me adopt soil health best management practices
Being a member has helped me improve upon soil health best management practices I was already using.
Through being a member, I have supported other farmers in adopting soil health best management practices.

Rate agreement (strongly disagree - strongly agree)

Please describe any specific ways that EFAO has helped you adopt or improve soil health best management practices. If possible, give a specific example.

_____

_____

To what extent to the following barriers limit your ability to adopt soil health best management practices?

Risk of yield loss
Too costly
Lack of knowledge
Lack of confidence
Lack of materials (e.g., equipment, seed)
Risk to insurance coverage
Concern about what neighbours would think
Other _____

Rate (does not limit me at all to is a severe limitation)

What would be required for you to overcome the barriers you identified?

_____

_____

Please share any additional comments you have regarding your involvement with EFAO in relation to soil health best management practices.

_____

_____

Thank you very much for participating in this survey!

If you would like to be considered for participation in a follow-up interview about these issues, please click on the following link.

Appendix B. Interview Guide

Introductory Details

- Personal:
  - Gender, age, family status
  - Length of time farming
  - Educational background (including farm training)
  - Career background (e.g., prior to farming; off-farm work)
- Farm:
  - Location
  - Scale (e.g., acreage, number of employees)
  - Main crops/products

EFAO Membership

- Length of membership(s)
- Motivation for membership(s)
- Role(s) played within organization(s)
- Please describe briefly your involvement with any other organizations that you feel is relevant for a discussion of your soil health attitudes and practices (e.g., farmer associations, environmental groups, community networks).

Use of ecological management practices

- Practices currently used on farm
- How long have you been using each?
- Motivations for adoption
- What factors have helped you implement these practices on your farm?
- What have been the main challenges in implementing these practices?
- Practices you would like to adopt but have not yet and reasons for non-adoption
- What do you perceive as the main reasons for relatively low rates of ecological management practice adoption in Ontario?

Involvement in Farmer-Led Research Program

- Role(s) played in the Farmer-Led Research Program
  - E.g., program leader/organizer, farmer-researcher, attending/hosting meetings, attending/hosting farm visits, learning about program results via website, newsletter, word-of-mouth, etc.
- Motivations to become engaged in the program(s)
- Time spent on program activities
- Please briefly describe your involvement, if any, in other farmer peer learning programs.

FLRP Impacts

- What do you feel have been the most important impacts of your involvement with the FLRP?
- Can you describe any specific examples of new knowledge you have gained through the program and how you have applied this knowledge? Shared this knowledge with others?

- Can you describe any specific examples of new relationships you have built through the program, and how those relationships have impacted your knowledge and/or practice of ecological farming practices?
- Can you describe how your involvement in the program has changed your attitudes about ecological management practices, if at all? Has your thinking shifted as a result of program involvement?
- Can you describe how your involvement in the program has changed your perception of the potential risks involved in ecological practice adoption, if at all? Risks to consider could include:
    - Negative perceptions of family, friends, neighbours, community members
    - Cost/investment required for adoption
    - Potential for yield loss
    - Weed and/or pest issues
- Can you describe how your involvement in the program has impacted your soil health, if at all?
    - Have there been any related impacts? E.g., changes in yield, pest resistance, input costs, etc.
- Any unanticipated/surprising impacts of your involvement in the program
- How would you compare peer learning programs like the FLRP to other efforts at supporting ecological management practice adoption? What are the main advantages/disadvantages of the peer learning model?

Barriers to Program Success

- What do you feel are the most important shortcomings of the FLRP?
- What, if anything, has limited your ability to personally engage with the program and/or to apply program learning or experiences to your own soil health management? (e.g., time constraints, resource constraints including funds or equipment, social barriers including opinions of friends, family, neighbours)
- What do you think the most important barriers are for other farmers becoming involved in this kind of program?

Recommendations

- Do you have any specific recommendations for improving the quality of the FLRP?
- Do you have any recommendations for how organizations like EFAO could *better* support *more* farmers in adopting ecological farming practices?
- Beyond EFAO, what are the main supports you feel are needed to encourage better rates of ecological farming in Ontario?
    - e.g., policies, funding, knowledge (try to be specific), equipment

Other Comments

_____

_____

Appendix C. Focus Group Discussion Guide

Overview & Goals

The main goal of the workshop will be to collect information about the ways in which EFAO's Farmer-Led Research Program influences adoption of ecological farming practices.

We will use an Appreciative Inquiry approach (https://www.centerforappreciativeinquiry.net/). Rather than focusing on challenges or problems, Appreciative Inquiry seeks to examine and better understand solutions. In this workshop, we will identify aspects of the FLRP that are working best and explore the underlying conditions for those successes. We will also envision how EFAO can build upon FLRP strengths to increase impact in the future.

Participants will be encouraged to share specific stories that demonstrate how FLRP is supporting farmers in moving toward greater adoption of ecological practices. They can create titles and/or visuals for the stories that capture key themes, as well as taking conventional notes.

Discussion Guide

1. Goals for Discussion
    a. Identify what's working best with the FLRP.
    b. Try to understand the conditions for success.
    c. Envision how successes can be built upon in the future.
    d. Document FLRP stories to share with others.

2. Introductions

3. Can you share a specific story about how the FLRP contributed to you and/or other farmers adopting or improving an ecological farm practice?
    a. What factors made the success possible?

4. Thinking about the FLRP, what has been the most "eye-popping" result or impact of your participation? What impact or accomplishment have you been most proud of?

5. Thinking about the FLRP, what are the most important changes have you seen?
    a. For your farm
    b. For you as a person
    c. For your larger community

6. Thinking about the FLRP, what opportunities are there to increase impact? What conditions would allow us to get there?
    a. Resources
    b. Partnerships
    c. Policies
    d. Other

7. What has been the most meaningful part of participating in the FLRP for you?

8. Final comments

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Special Section:
Fostering Socially and Ecologically Resilient Food and Farm Systems Through Research Networks

SPECIAL SECTION SPONSORED BY:

Successes and challenges of a university-based agroecological community garden and educational program in Japan

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Abstract

The growing problems associated with industrial agriculture have led to a greater recognition of the significance of alternative agriculture beyond Anglophone and European countries. This article explores Utsunomiya University's Eco-programs, which combine a pesticide-free and synthetic fertilizer-free community garden with an educational lecture and activity series. It draws on ethnographic data from interviews and participant observation, as well as document and archival analysis. Based on our findings, we argue that tensions emerge between the initial agroecological goals with which the Eco-programs were established and other institutional goals pursued at the university. Despite these tensions, the Eco-programs create an important space for participants to encounter and explore agroecological gardening. They also provide an informative example of a transdisciplinary alternative agricultural initiative in Japan. We stress the importance of recognizing the contexts in which alternative agricultural initiatives emerge,

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Authors Disclosure

The authors are faculty in Utsunomiya University's Agricultural Department. Two of the authors are faculty at the university farm, one of whom currently directs the Eco-programs. The authors have no financial interest in this research and do not benefit from the outcomes of this research.

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and the reality that conflicts often arise because alternative agricultural goals differ from the goals of the markets, states, and bureaucracies in which they operate.

Keywords
Community Garden, Alternative Agriculture, Agroecology, University Farm, Japan

Introduction

In contrast to the dominant model of capitalist agriculture that relies on synthetic fertilizers and pesticides, scholars have drawn attention to the importance of cultivating alternative models, known by a variety of names, including agroecological agriculture, diverse agriculture, and regenerative agriculture (Anderson et al., 2021; Kremen et al., 2012; Rhodes, 2017; Sarmiento, 2017). Much of this alternative food scholarship focuses on Anglophone or European countries. Just as major differences emerged between alternative food in the U.S. and Europe (Holloway et al., 2007), so too does alternative agriculture vary based on the context in which it emerges (Schrager, 2018; Sonnino & Milbourne, 2022). Scholars have analyzed multiple aspects of alternative agriculture in Japan, including the teikei community supported agriculture (CSA) movement (Kondo, 2021; Kondoh, 2015), organic agriculture (McGreevy, 2012; Moen, 1997; Rosenberger, 2017), the mobilization of citizen scientists to monitor food safety in the aftermath of the Fukushima disasters in 2011 (Kimura, 2016; Sternsdorff-Cisterna, 2018), and the hybrid zones between peasant and corporate agriculture (Hisano et al., 2018). Though similar issues emerge across these initiatives, the larger alternative food movement in Japan is better thought of as multiple overlapping movements that respond to the negative consequences of the expanding industrialization and centralization of food systems in Japan and around the world.

This article examines Utsunomiya University's Eco-farm and Eco-college programs as one such example of an alternative agricultural initiative in Japan. The Eco-farm is a pesticide-free and synthetic fertilizer-free community garden established by Professor Emeritus Maeda Tadanobu.[1] It opened to the public in 2006. After Maeda retired in 2008, the university combined the Eco-farm program with a newly established educational lecture and activity series called the "Eco-college" program. We use "Eco-programs" to refer to both the Eco-farm and the Eco-college programs.

We argue that tensions exist between the objectives of the Eco-farm and Eco-college programs. While the Eco-farm was initially established by Maeda in response to his concerns over the excessive use of agrochemicals in Japanese agriculture, the decision to introduce the Eco-college program and combine it with the Eco-farm program reflected the university's institutional goal of engaging in community outreach. During the COVID-19 pandemic, the Eco-programs were suspended for two years. We believe the decision to suspend the programs might have been avoided if the Eco-farm's contribution to the resiliency of local food systems and communities had been formally recognized. Such divergences between the goals of institutions and the goals of alternative agricultural initiatives are far from unusual. They emerge frequently, due to the pressure initiatives face from the markets, states, and bureaucracies in which they operate.

The Eco-programs foster opportunities for participants to encounter agroecological farming. Given the prevalence of agrochemicals and synthetic fertilizers in Japanese agriculture, the Eco-programs offer a unique space for participants to avoid these industrial practices. University farm faculty and staff manage the agronomic and bureaucratic administration of the program. Every March, farm staff use tractors to spread composted cow manure and mix it into the soil, providing participants with access to high-quality soil in which they can grow agrochemical-free and synthetic fertilizer-free crops. While community gardens are common throughout Japan, they seldom prohibit the use of agrochemicals and synthetic fertilizers. To the best of our knowledge, the Eco-program is the only community garden in Japan that combines the characteristics of being administered by a university, prohibiting the use of agrochemicals and

[1] Japanese names are written using the Japanese order so that the family name precedes the given name.

synthetic fertilizers, and enlisting participants in an educational and activity series. The Eco-programs are transdisciplinary because they provide an agroecological community garden to nearby residents that, along with the lecture series, fosters a unique learning and research environment for participants.

This article is authored by three faculty in Utsunomiya University's Agricultural Department. Two of the authors are faculty at the university farm, one of whom currently directs the Eco-programs. These authors provided information on the history and operation of the Eco-programs. From November 2022 to January 2023, the first author interviewed six Eco-program participants, one Eco-college lecturer, and the now emeritus faculty who created the Eco-farm. These interviews explore the Eco-programs' connection with the themes of this special issue's focus on transdisciplinary research networks and regenerative food systems. In April and May 2023, the first author conducted participant observation by joining the Eco-programs, attending Eco-college events, and tending a plot with graduate students. As DeLind (2011) shows, interviews and participant observation are suitable methods for linking specific case studies with broader developments in alternative agriculture networks.

The article is structured as follows. First, we provide background on the Japanese context and how it intersects with the themes of the special issue. Next, we introduce Utsunomiya University and the background of the Eco-programs. Then, we describe the Eco-farm and Eco-college programs. Last, we draw some conclusions. We expect that the Eco-programs differ significantly from other collaborative research networks in this special issue. We hope that these differences can broaden what practitioners can learn from the wide range of projects operating in different contexts, creating new opportunities for future exchange, and strengthening the resiliency of these networks.

The Context for Alternative Agriculture in Japan

In this section we briefly examine the context of alternative food systems in Japan. We begin by noting that, while the context of alternative agriculture in Japan emerged in a unique context that differs from that in Western countries, major differences also persist within and between Western countries. Holloway et al. (2007), for example, contrast ideas of alternative agriculture that emerged in the U.S. with those that emerged in Europe. They argue that, in the U.S., alternative agriculture emerged through oppositional politics and commitment to social justice, but that alternative agriculture in Europe tends to be less oppositional and encompasses a diverse range of motivations. Alternative agriculture is better understood as an idea that emerges through situated geographies rather than as a universal idea that operates in space (Schrager, 2018). Initiatives like the Eco-programs may differ significantly from English-language ideas of alternative agriculture, and so such programs should be considered in the broader context from which they emerge.

In an analysis of natural farming and organic agriculture in Japan, Miyake and Kohsaka's (2020) periodization distinguishes between the natural farming (*shizen nōhō*) methods that took hold in the 1930s, the organic farming and teikei systems that emerged in the 1970s, and the institutionalization of organic certification through government-implemented standards in the 1990s. They argue that the earlier natural farming of the 1930s and organic agriculture of the 1970s maintained a strong connection to nature (*shizen*) and philosophies rooted in environmentalism. In so doing, these earlier initiatives promoted agroecological approaches to farming. In contrast, the government's formalized approach to organic agriculture in the 1990s emphasized market-based goals.

Community gardens were one facet of Japan's alternative agriculture movement. They are called *shimin nōen* in Japanese, which translates as "citizen gardens," indicating a direct link between community gardens and the ideals of citizenship. In an analysis of the historical development of Japan's community gardens, Kudo (2009) identifies three different periods. During the first period, from the 1920s to the 1950s, shared green spaces for gardening drew on Western park designs that were repurposed to provide spaces to grow food amid wartime deprivation. During the second period, from the 1960s to the 1980s, demand for community gardens increased as Japan experienced rapid

Table 1. Key Developments for Alternative Food, Community Gardens, and Organic Certification in Japan

Period	Administration	Orientation	Description
1920s	Local government	Community garden	Public parks and green spaces inspired by Western park design ideas.
1930s	Decentralized	Alternative agriculture	Natural farming promoted by charismatic leaders and serving as an alternative to industrial methods.
1940s	Local government	Community garden	Parks adjust to provide spaces for food production in response to wartime and post-war deprivations.
1960s	Local government	Community garden	Urban demand for community gardens increases as rural to urban migration expands alongside Japan's rapid economic growth.
1970s	National organization	Alternative agriculture	The Japan Organic Agriculture Association (JOAA) is founded in 1971 with a commitment to environmental activism.
1990s	Government ministry	State policy	The Ministry of Agriculture, Forestry and Fisheries (MAFF) introduces a national standard for organic certification.
1990s	National government	Community garden	Changes to regulations facilitate the establishment of community gardens.
2010s	Decentralized	Alternative agriculture	Distrust of government and corporate control deepens in response to the 2011 Fukushima disasters.
2020s	Government ministry	State policy	MAFF introduces the green food system strategy with the goal of increasing organic farmland to 25% by 2050.

urbanization, economic growth, and trade liberalization. During the third period, from the 1990s to the present, new regulations have facilitated the establishment of community gardens, responding to citizens' growing desire to reconnect with agricultural production. Table 1 identifies the administrative scale and organization of these developments for alternative agriculture and community gardens in Japan.

In addition to these key developments, we identify several defining characteristics of the historical development of alternative agriculture in Japan. First, charismatic leaders have been influential in the establishment of alternative initiatives, leading to a diverse array of alternative initiatives across which coordination is limited. Second, due to several highly publicized, violent incidents associated with leftist activism in the late 1960s and early 1970s (Steinhoff, 2013), alternative agricultural movements often distanced themselves from overt political activism. Third, the interjection of the government into alternative agriculture, such as through the introduction of a national organic standard, increased suspicion within the alternative movement of the centralization of government and corporate control. As a result, alternative agriculture in Japan is decentralized, with an emphasis on adherence to self-identified values and practices. This decreases coordination within the movement and legibility for outside observers.

In the English-language literature, Fukuoka Masanobu (1913-2008) is one of the most widely recognized alternative agricultural leaders from Japan. Fukuoka worked as a crop scientist before committing himself full-time to managing his own farm in Kochi Prefecture and teaching others his evocatively named "do-nothing" way of farming. Fukuoka (1975/1978) writes, "To plant, I simply broadcast rye and barley seed on separate fields in the fall, while the rice is still standing. A few weeks later I harvest the rice and spread the rice straw back over the fields" (p. 3). Admirers from around the world studied at Fukuoka's farm and translated some of his writings into other languages, forming the community described in Korn's introduction to Fukuoka's (1975/1978) *The One-Straw Revolution*. This book would go on to elevate international awareness of Fukuoka's methods. Fukuoka is a prominent example of the key role that leadership plays in establishing alternative agricultural

initiatives in Japan.

In the late 1960s, teikei emerged as an influential system for promoting alternative agriculture (Kondoh, 2015). Teikei often organized around regular deliveries of produce from environmentally inclined producers to like-minded consumers, a precursor to today's CSAs. As opposed to orthodox CSA, teikei encompassed a diverse range of producer and consumer collectives. The Japan Organic Agriculture Association (JOAA), founded in 1971, became strongly associated with teikei leadership and activities (Kondo, 2021). The founders of JOAA maintained a commitment to political activism, with many of its early leaders actively challenging the logic of capitalist agriculture (Moen, 1997). For example, JOAA members put forward "The Ten Principles of Teikei" in 1978, including precepts that encouraged "participatory, democratic involvement by all members" and "attaining a balance with nature and a relationship of human equality that is based on organic agriculture and the organic link between farmers and consumers" (Moen, 1997, pp. 18–19).

While organic agricultural activism surged in the 1970s, Japanese society began souring to leftist activism. A key event in the shift away from confrontational protest occurred in February 1972, when leaders of the United Red Army, a militant leftist group, took hostages at the Asama Sansō mountain lodge in Karuizawa while fleeing from the state. Police demolished the building with a wrecking ball and the hostages eventually emerged unharmed in a confrontation that was watched "by over 90% of the television viewing audience" and cast a pall over overt political activism in Japan (Steinhoff, 2013, p. 153). Japan's environmental activism similarly underwent a shift away from confrontational protests and toward more localized mobilization, which the government sought to resolve by creating new bureaucracies that treated protesters' claims as a set of technical disputes (Avenell, 2012). Along with changing attitudes toward political activism, alternative agricultural organizations shifted their stance on political protest as they sought to create a welcoming atmosphere for potential members.

The JOAA encouraged the government to introduce a Japanese Agricultural Standards (JAS) for organic agriculture, and one was eventually adopted in 2001. After the government introduced the national organic standard, however, few JOAA farmers opted to certify their farms. Rosenberger (2017) explains that JOAA farmers "refused to sit on a government committee with large organic producers whose organic principles were more lenient than theirs" (p. 17). Even though many alternative farmers avoided centralized certification schemes, their avoidance did not indicate a commitment to political activism. Rosenberger (2017) finds that young JOAA farmers in their 30s and 40s are less inclined to emphasize organic agriculture as a social movement and more inclined to emphasize practical goals, such as having a high quality of life and cultivating connections with the rural communities where they reside.

The triple disaster at the Fukushima nuclear plant on March 11, 2011, caused irradiated food to enter the Japanese food system, creating a mobilization of citizen scientists who wanted to ensure that food was safe to eat (Kimura, 2016; Sternsdorff-Cisterna, 2018). For example, Kimura (2016) reveals how mothers framed their concerns as a maternal commitment to protecting the health of their children. The surge in food safety concerns among the Japanese public contributed to burgeoning interest in alternative food networks (Hisano, 2015; Rosenberger, 2016). Today, new pathways are emerging for young farmers in Japan, but Japanese agriculture faces daunting structural issues of graying farmer demographics and growing swaths of abandoned farmland (Hisano et al., 2018; McGreevy et al., 2019), as well as a looming transition among its leadership to younger generations. Kondo (2021) illustrates these challenges, as some teikei have transitioned to paying wages to workers instead of relying on volunteers, but these workers tend to express a lower commitment to movement ideals.

Despite Japan's low level of organic certified agricultural land, the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) announced an ambitious green food-system strategy in 2021 that aimed to increase the share of organic farmland from 0.5% in 2018 to 25% in 2050 (MAFF, 2021). The national government's promotion of organic agriculture reflects a growing conviction among policymakers in the benefits of certifying the

Figure 1. Arial View of Utsunomiya University's Farm

adoption of more rigorous production standards.

Apart from a few national organizations such as JOAA, most of the alternative agricultural initiatives in Japan are decentralized, without a reliance on national organizations or certification. For example, the Asian Rural Institute is an educational Christian nonprofit that operates in Tochigi Prefecture, about 31 miles (50 km) away from the Eco-farm, and teaches sustainable agriculture and community leadership to about 25 international students annually. Founded by the charismatic leader Takami Toshihiro, this school also faces tensions between its differing goals (Senda-Cook, 2021). Dispersed throughout Japan are a wide range of initiatives that contribute to the resiliency of alternative food networks, but their decentralized nature complicates efforts to recognize and evaluate the impacts of their activities. Major hurdles remain to building a more resilient food system that fosters the successful implementation of organic agricultural practices. Programs like Utsunomiya University's Eco-programs can help to reduce these hurdles by providing a unique space for participants to experience and experiment with agroecological farming.

Utsunomiya University and the Origins of the Eco-programs

Utsunomiya is the prefectural capital of Tochigi Prefecture and its most populous city, with 520,000 residents. Despite being a major regional hub, Utsunomiya is overshadowed by the metropolis of Tokyo that looms 63 mi. (100 km) to the south. Utsunomiya University is a national university (*kokuritsu-daigaku hōjin*), and the agricultural department is one of its oldest departments, founded in 1923. In 1983, Utsunomiya University established a university farm about 9.3 mi. (15 km) away from its original campus to more rural environs in Moka City. Utsunomiya University's farm is about 250 acres (101 hectares), making it one of the largest university farms in Japan. The farm has dairy cows, wagyu cows, rice paddies, fruit trees, and vegetables (see Figure 1).

In the 1980s and 1990s, Japanese universities moved to emphasize more than just education and research to include their institutions' contributions to society (*shakai kōken*) (Zhang, 2018). Utsunomiya University established the Center for Regional Collaborative Education and Research (*Chiiki renkei kyōiku kenkyū senta*) in 1991. During this period, the

university emphasized giving back to the communities in which it operated. The research farm was established with social contributions as a priority; therefore, the farm is oriented to conduct outreach to students, farmer communities, and neighboring residents. The crops and livestock raised on the farm serve as a model, both for teaching the public about agriculture and for demonstrating best practices. The faculty have also introduced new commercial varieties. The most successful of these is a variety of rice called "Udai21", introduced by Emeritus Professor Maeda Tadanobu in 1990. Udai is pronounced "you-dye", which sounds similar to the Japanese nickname for Utsunomiya University (***U****tsunomiya* ***Dai****gaku* → **U-dai**). Udai21 has received the top award at numerous rice tasting competitions in recent years, increasing its exposure beyond Tochigi Prefecture.

In addition to Udai-21, Maeda also founded the Eco-farm. The university opened the Eco-farm to the public in 2006 as an offshoot of longstanding research by university faculty and researchers on agroecological farming. In an interview, Maeda recalls related activities prior to the establishment of the Eco-farm:

> Rachel Carson's *Silent Spring* was big news even in Japan. Of course, some students would want to experiment [with agrochemical-free farming]. This was before the University Farm was built. Back then, I was working in the Mine campus at what we called the "Central Farm" (*chūō nōjō*). I had a lot of freedom to pursue my interests. (Fieldnotes, January 2022)

Tracing the lineage of the Eco-farm back to Rachel Carson (1962), Maeda emphasizes that he and his students sought to avoid using agrochemicals. He started the Eco-farm in response to his long-term concern over the over-use of agrochemicals in Japanese agriculture and his interest in agroecological farming.

Maeda described another event that contributed to the establishment of the Eco-farm:

> The nearby cattle operation had a lot of composted organic manure that they were stuck with. The deal they had in place to sell it fell through. They contacted us and asked if we couldn't work something out. For a big cattle operation like that with something like 100 head, they produce a lot of waste. I was like, "Okay, please bring the compost to the farm." They piled it all up in a mountain that weighed like 100 metric tons. That was so much we couldn't easily use it up. (Fieldnotes, January 2022)

Maeda went on to explain that they wanted to put the compost on the fields, but putting too much compost in the shallow upper layer of the soil would harm the crops. To figure out how to use this bounty of compost, they experimented. Instead of the usual 6 in. (15 cm), they tilled the fertilizer 12 in. (30 cm) deep into the soil. Using these deep-till methods, Maeda determined that they could boost yield by applying more than double the amount of compost without any adverse consequences.

Maeda's charismatic leadership enabled him to establish new initiatives like the Eco-farm. In 2006, Maeda oversaw the opening of the Eco-farm to the public in a program called the "Open Eco-farm" that operated as an agrochemical-free and synthetic fertilizer–free community garden. Under Maeda, participants were not charged a fee. There were no mandatory lectures or activities for participants, but on two Saturdays per month, Maeda visited the Eco-farm to give advice and discuss the challenges of the program and alternative agricultural practices with participants. While Maeda's leadership and commitment to alternative agricultural practices proved crucial to the establishment of the Eco-farm, he retired two years later. After Maeda retired, the goals of the Eco-farm shifted to fulfill the university's institutional goal of community engagement, a shift discussed in the Eco-college section.

Eco-programs

In the ensuing sections we describe and analyze the Eco-programs.

The Eco-farm Community Garden

The Eco-farm community garden is tucked in a corner of Utsunomiya University's farm. Each

year, participants apply for the program and, if accepted, pay 5,000 yen (~US$40) to join and gain 10 months of access to a garden plot. After Maeda retired, the program directors decided to charge a fee for participants to receive a garden plot, and this fee was reportedly calculated based on the value of surrounding farmland. Compared to other community gardens in Tochigi Prefecture, the fee for the garden plot is low. Agrochemical-free and synthetic fertilizer-free community gardens are rare, and so some participants drive from as far as an hour away to access this community garden. In 2022, the Eco-farm had 32 plots managed by 58 participants. Individual plots are 18 ft (5.6 m) by 34 ft (10.5 m) or 633 ft^2 (58.8 m^2). Since actively tending this size garden without agrochemicals can be physically demanding, some participants split their plot with family or friends. The plots can also produce a lot of food; gardeners describe their plots as producing more than they can eat and their enjoyment of sharing what they cannot eat with others. The garden also has a communal area for people who want additional space that is 265 ft (80.8 m) by 33 ft (10 m) or 8,700 ft^2 (808 m^2). The total size of the Eco-farm is roughly two acres (8,000 m^2) (see Figure 2).

There is a transitory period from late February through March when the academic year ends and gardeners lose access to their plots. Participants must reapply to the Eco-programs each year, and each year they are assigned a random plot. The break in February and March enables the university to manage the Eco-farm's soil. Although gardeners accept these decisions as being beneficial overall, they noted some drawbacks. The break prevents them from growing perennial crops or some winter crops, such as onions. Also, while the random allotment of garden plots ensures that each participant has equal access to favorable plots, this randomness limits their knowledge of each plot. By the time they have figured out what grows best where, a new year is approaching, and with it, a new plot.

In 2022, farm staff conducted seven tasks over the break from late February to March (see Table 2). Staff tilled the soil multiple times. After applying 8,800 lbs. (4,000 kg) of cow compost, they tilled the soil to a depth of 8–10 in (20–25cm). The university has cattle, so the cow compost is sourced from within the university farm as part of

Figure 2. Arial View of the Eco-farm Community Garden

Table 2. Maintenance of Eco-farm in 2022

Date	Machinery	Attachment	Notes
2/21	Ford 7840	Subsoiler	Depth 20-24 in (50-60cm)
3/9	Yannmar CT80	Rotary	Depth 8-10 in (20-25 cm)
3/12	Ford 7840	Manure spreader	8,800 lbs. (4000 kg) cow compost
3/12	Wheel Type Loader Mitsubishi WS210	Bucket	
3/14	Yannmar CT80	Rotary	Depth 8-10 in (20-25 cm)
3/23	Yannmar CT80	Rotary	Depth 8-10 in (20-25 cm)
3/23	Kubota KL53ZH	Ridger	
5/20	Kubota SL55	Disc harrow	Clearing weeds
9/28	Kubota KL505	Disc mower	Clearing weeds

an integrated crop and livestock system. As Table 2 indicates, the Eco-farm leverages the university's resources in the form of staff labor and machinery to provide participants with a solid foundation from which they can experiment with alternative gardening practices.

Eco-farm Gardeners

Utsunomiya University faculty conduct a survey of Eco-farm garden plot holders every year. In 2022, the Eco-programs survey had 26 respondents out of 32 plot-holders, for a response rate of 81%. The following crops were grown by at least 20% of respondents: daikon (65%), taro (65%), potatoes (65%), sweet potatoes (62%), peanuts (50%), edamame (46%), kabocha (Japanese pumpkin) (42%), komatsuna (27%), green onion (27%), hakusai (27%), ginger (27%), cabbage (23%), spinach (23%), and watermelon (23%). All of these popular crops can be bought in local supermarkets and farmers' stands. However, participants want to grow these crops on their own, and those who were interviewed were adamant that the food they grow tastes better and is sweeter.

Two first-year gardeners, Kaori[2] and Chieko, who share a plot, illustrate how the university provides a strong foundation for amateur gardeners to grow food. In an interview, they enthusiastically rattled off some of the crops they grow: azuki, edamame, arugula, komatsuna, watermelon, cucumber, eggplant, basil, kabocha, green pepper, okra, gōyā (bitter melon), daikon, carrots, beets, sweet potatoes, potatoes, and taro. Kaori, a woman in her mid-60s, explained, "This is my first year, so I want to try growing lots of things." She also explained some of her background with farming and gardening:

> My family are rice and onion farmers. They used to grow things like tomatoes and cucumbers. I've seen that and I know how to grow it. They plant it, it becomes like this [big gesture], but in my garden when I plant it, it becomes like this [small gesture followed by laughter]. Why is that? I thought at least it would get this big [medium gesture]. (Fieldnotes, Dec. 2022)

Although Kaori has a background in farming, she struggled to grow crops on her own. Later in the interview, Kaori elaborated on how the management of the land by university staff enabled her to successfully grow crops. She said, "Even without doing anything, there is good soil. If you plant seeds, you can do it. Just like that. For someone like me who doesn't know anything, it was really easy." This description of gardening as easy is best understood as easy in comparison to gardening without the support of the university's management of the soil. The easiness also indicates the enthusiasm she feels for, and pride she takes in, gardening at the Eco-farm.

Kaori shares her plot with Chieko, a woman in

[2] Kaori and Chieko are pseudonyms.

her late 50s. Like Kaori, Chieko turned to the Eco-farm after failing to grow food on her own. She said:

> For two years, I tried growing vegetables in planters on my veranda. Of course, I wanted to get agrochemical-free vegetables. It didn't go well at all because of the bugs. After the bugs got into it, I did research and tried different things, but of course it didn't turn out well. At that time, I learned about [the Eco-farm]. Rather than growing by myself, growing with other people is a much better way to learn. (Fieldnotes, December 2022)

Later in the interview, she elaborated on the benefit of being a part of an active community of agroecological gardeners:

> When I did it by myself in the planter, the only way I could get information was by searching the Internet. I try doing it the way they say, but it didn't turn out well. From that view, becoming a member here I'm able to get realistic advice from veteran (*senpai*) gardeners who know a lot. "It's actually like this." This type of advice is hard to find. (Fieldnotes, December 2022)

Kaori did not have the knowledge and support to grow agrochemical-free food on her own, but after joining the Eco-farm she gained not only the institutional support of good soil, but has also become part of a community of gardeners who share knowledge, tools, and seeds with each other.

The biggest challenges that gardeners reported were from weeds, insects, birds, and disease. The gardeners frequently mentioned how much time they spend pulling weeds. Since there are restrictions on using plastic, they use organic material such as rice chaff to hinder weed growth (see Figure 3). The gardeners acknowledged the unpredictability of growing crops at the Eco-farm. A longtime participant in her late-70s explained:

> Even in the same plot, I put taro here it grows and here it doesn't grow at all. It's mysterious. I use the same seeds. … And this year our hakusai was decimated. Previously, we were able to grow it well. But it's not the same field. The cabbage nearby is turning out wonderfully. We have things that melt. This year it's hakusai, but four or five years ago our carrots melted. That's definitely because the previous gardener grew something like the same thing in that spot. (Fieldnotes, December 2022)

As the participant points out, her knowledge is limited, because plots are randomly assigned every

Figure 3. Rice Chaff Used on a Garden Plot to Reduce Weeds

year. If she could keep the same plot, then she could experiment with strategically rotating crops. But as was previously noted, randomly assigning plots is one of the Eco-farm rules that is intended to ensure that all participants are treated equally.

Through participant observation, we observed that the Eco-farm garden helps to create unique exchanges and experiences, as well as fosters generosity among participants. Some participants bring their children along with them to the community garden for joint activities such as rice planting. Their children then play in the mud and soil. Given the restrictions on agrochemicals, the Eco-programs provide parents with additional confidence to permit their children to get dirty and experience gardening. We also benefited from the generosity of more experienced members, who helped us establish our own plot. As first-time participants, we were appreciative when a veteran member showed us how to use various tools in the shared Eco-farm shed. When we expressed interest in farming sweet potatoes, they gifted us sweet potato and taro and showed us how to plant them in our plot. Following an interview with a participant in November 2022, she insisted on gifting us a large daikon and hakusai from her plot. We saw seedlings given away for free in the toolshed, and learned from a participant how disposable chopsticks are a useful tool for transplanting seedlings into our garden bed. The Eco-farm provides a space for program participants to experiment and to foster a community around agroecological gardening.

Eco-college

Utsunomiya University's website describes the Eco-programs on a webpage dedicated to the local contribution (*chiiki kōken*) of the university farm as follows:

> Citizens with an interest in organic agriculture, food safety, and local consumption of local products voluntarily manage the Eco-farm with advice from faculty on how to grow agricultural produce. Once a month, there is a lecture and joint activity for the participants that creates an opportunity for exchange. (Utsunomiya University, 2023, para. 2)

After Maeda retired in 2008, the faculty in charge of the Eco-farm combined it with a new lecture and activity series called the Eco-college. The precise justification for combining the Eco-farm with the Eco-college program is unclear, but university administrators appear to have sought to link the agroecological community garden with regular events that explicitly connect with the university's goals of education and community outreach. The Eco-programs pressure participants to attend Eco-college events by taking attendance and situating future enrollment in the program as contingent on attendance.

When Maeda established the Eco-college, he invited participants to join in activities such as rice planting, but participation was voluntary. His bimonthly visits to the farm created opportunities for applied conversations focused on the challenges of alternative gardening practices. In contrast, the Eco-college operates as a lecture series that occasionally organizes joint activities such as rice planting. Although participants are present in the same room during lecture, there are few opportunities for them to interact with each other. For participants, the gap between the Eco-farm and Eco-college programs can be jarring. For instance, after attending the Eco-farm orientation on April 8, 2023, a participant shared their confusion as we walked over to survey our plots. They had been hoping that they would learn what they should do with their plot and still felt at a loss. Perhaps they had been expecting that the orientation would be more of an interactive forum for sharing information on alternative gardening techniques suitable to the Eco-farm. Instead, the first half of the two-hour event focused on welcoming participants and explaining logistical changes from the previous year. The second half was a special guest lecture on spring crops. Most of the Eco-college lectures are given by university farm faculty, and the content of these lectures resembles their outreach and educational presentations.

One gardener in his early 70s, who has been participating in the program for the last 15 years, brought to the interview a huge binder with all the lecture slides that the lecturers distribute. Told that we would like to have a chance to study these documents in more detail, he responded, "Every year,

we get similar documents." He then added, "There are parts that change a little bit." The educational benefits that participants receive from attending the Eco-college appear to decline over time. During the question-and-answer time at the tail end of a two-hour lecture on April 29, 2023, one elderly male participant stood up and shouted, "Let's go home!" The current structure of the program requires Eco-farm participants to attend variations on the same agriculture-themed lecture and activity series every year, in order to access an affordable agrochemical-free and synthetic fertilizer–free community garden.

The current iteration of the Eco-college diverges from Maeda's initial pedagogical approach of active learning with an emphasis on agroecological goals. If the goal of the Eco-college is not agroecology, but rather community outreach, the program could be made open to the public and not limited to Eco-farm members. Institutionally, this might well prove difficult, as outreach would be required to ensure an adequate number of attendees at each lecture or activity. Interviews with program participants and participant observation indicate that the Eco-programs would benefit if the goals of the Eco-farm and Eco-college programs are clarified to determine the extent to which the goals of these programs are complementary. If the goal of the Eco-farm is to foster a community space for exploring and refining agroecological gardening, then group activities should be designed to work toward that goal. Gatherings of Eco-farm participants that might further this goal include small group discussions of agronomic challenges, creating a handbook for new members, and demonstrating how to use the different tools in the community shed.

Eco-farm Rules

The word organic (*yūki*) is frequently used in connection with the Eco-farm. This usage of organic does not indicate organic certification, but rather a commitment to alternative and natural farming. The Eco-farm has stricter rules than organic certification in some respects, but is more lenient in others. Because the Eco-farm uses cow manure from cows that are not certified organic and eat feed that is not certified organic, the Eco-farm would not qualify for organic certification. However, in other ways, the Eco-farm is stricter than organic certification, because the use of all agrochemicals, including so-called organic agrochemicals, is prohibited. A senior member of the group in his early 80s described how he helped establish a detailed set of rules that could be enforced:

> Before we made stuff, there were lots of people who didn't follow the rules. I saw that the rules weren't being followed and wrote up detailed rules and gave it to the office. The next year when there was the opening of the farm, they distributed the rules. In particular, people would bring children to play, but it was very dangerous. People would use string to keep the birds out of their plots, but they were using fishing string that is thin and can't be seen. That was dangerous for children. We banned that. We make sure to put that in the rules. We tell people, "That was in the rules, wasn't it?" And so we can strongly protect the rules. (Fieldnotes, January 2022)

Aside from the rules against using synthetic fertilizer and pesticides, many of the rules prohibit the use of plastic coverings and stands so that this plastic does not get left behind in the soil. Additionally, in interviews, participants described a debate over the best way to handle seedlings. Garden stores often sell seedlings that are easier to grow than seeds, but are treated by the stores with pesticides. To avoid bringing pesticides into the Eco-farm, participants should either grow all of their plants from seed or buy seedlings that are specifically labeled as pesticide-free. Although this discussion emerged in interviews with experienced Eco-program participants, it was not addressed during the orientation session, so some participants might be unaware of this issue. Eco-farm rules provide an important basis for the alternative practices that participants explore in their gardens, but the nuances of these rules, and establishing a space to discuss them, prove challenging.

Closure during COVID-19

During the COVID-19 pandemic, the Eco-farm ceased operations for the 2020 and 2021 academic

years. In retrospect, many feel that the Eco-farm program would have been a perfect activity to keep running during the pandemic. The gardens are outdoors and socially distanced. Gardening would have provided participants with an opportunity to get exercise and boost their mental health. The food provided would have contributed to the resilience of food systems at a time when they were strained by the pandemic. Rather than think of the Eco-garden and Eco-college as separable programs, though, they were considered as joint Eco-programs, and since the Eco-college requires large in-person gatherings for lectures and joint activities, both were cancelled.

This decision made during the pandemic sheds light on some of the strengths and challenges of having a university-supported community garden. The university has resources that enable it to manage the soil and provide a solid structure for participants. Unlike an organization dedicated to agroecological goals, however, the university administers many programs like the Eco-programs under the rubric of societal contribution and community outreach. As a result, the Eco-programs were not deemed essential during the pandemic.

Discussion: Fostering Alternative Agricultural Initiatives across Different Contexts

The Eco-programs are a unique initiative operated by a university that provides a space for participants to encounter and experiment with alternative agricultural practices through an agrochemical-free and synthetic fertilizer–free community garden. In this article, we argue that tensions persist between the agroecological goals associated with the Eco-farm dimension and the institutional goals of community outreach associated with the Eco-college dimension of the initiative.

This research provided us with the opportunity to recognize these tensions and discuss potential ways of resolving them. Maeda established the Eco-farm based on his commitment to agroecological goals, but after he retired, the program shifted to fulfill institutional goals of community outreach by creating the Eco-college lecture and activity series, which Eco-farm participants are requested to attend. Since the goals of the Eco-farm were never framed explicitly in terms of agroecological outcomes, university administrators blended the goal of an agroecological community garden with other institutional goals. The university's goal of societal contribution measures community outreach as a key indicator, and this indicator emphasizes the number of community members who attend university events. The Eco-programs would likely benefit from clarifying the goals of these two programs in order to evaluate the extent to which they are complementary. The closing of the Eco-farm during the pandemic indicates that the agroecological and food system contributions of the Eco-farm should receive greater recognition going forward. If leadership determines that the goals of the Eco-college and Eco-farm are incompatible, the Eco-college could be split off from the Eco-farm as a lecture and activity series open to the public. Another option would be to reimagine the Eco-college with an emphasis on active learning and exchange focused on furthering agroecological gardening for participants.

Although these tensions between the goals of alternative agriculture and societal contribution are particular to the Eco-programs, many alternative agricultural initiatives face the challenge of fulfilling multiple goals that, at times, are in conflict. Since transdisciplinary initiatives do not fit the typical mold of a familiar discipline or objective, they face an even greater risk of having alternative agricultural goals infringed upon or superseded. Instead of the familiar educational setting of teaching students in a classroom, the Eco-farm created a space at the university for community residents to directly participate in agroecological farming. Absent the vision of the founder and without a clear mission outlining its goals, administrators sought to make the Eco-farm more familiar by combining it with the Eco-college lecture series. Since Maeda retired, numerous faculty and administrators have maintained the program's operation, a testament to how strongly it resonates with program participants and the university's capacity to successfully execute such a program. We hope that the Eco-programs' successes and challenges resonate with other practitioners and create new opportunities for collaboration and reflection that help to build toward resilient food systems.

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Fostering Socially and Ecologically Resilient Food and Farm Systems Through Research Networks

SPECIAL SECTION SPONSORED BY:

Intellectual property exhaustion, breeder frustration, and hindered innovation: Reviewing U.S. organic corn seed development

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Abstract

Private-sector dominance of plant breeding constitutes the present norm of organic seed genetics research, which has generated concerns in the organic farming community in this era of robust intellectual property protections. Intellectual property restrictions primarily in the form of certificates, patents, and contractual arrangements are blamed for stifling the innovation of organic seed varieties. To better understand the challenges small-scale and university-based breeders and researchers face in organic corn seed genetic development, this article provides an overview of intellectual property structures surrounding seed innovation and sharing. After describing the legal landscape in which organic corn seed research and

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Conflict of Interest

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development occurs, the article details research efforts exploring the veracity of claims that contractual arrangements (in the form of seed-sharing agreements between breeders and universities) stifle the innovation of organic varieties. In doing so, the article describes the search methodology utilized and highlights a critical barrier to research: the closely guarded nature of private contracts that parties are reluctant to reveal. While we were able to identify several data points that highlighted the importance of seed-sharing agreements as a part of the intellectual property regime controlling organics research and breeding, we were unable to obtain contracts or identify disputes over contractual language to further analyze. Such contractual language only becomes available upon consent and release by individual parties to the contract or by litigation that exposes the contractual language, both of which we attempted to explore and utilize. The article concludes with a discussion of why contractual arrangements in the context of organic corn seed development are an informative piece of the intellectual property puzzle worth exploring, as well as future points of research necessary to yield data substantiating the concerns of stakeholders in the organic seed industry.

Keywords
Seed Sharing, Organic Corn, Transdisciplinary Research Networks, Intellectual Property, Legal, Breeding Networks, Contracts, Land-Grant University, Open-Source Seed

Introduction

With private-sector dominance of plant breeding constituting the norm of organic seed genetics research, growing concerns voiced by the organic farming community warrant a closer examination of the intellectual property structures governing seed research and plant breeding. Seed saving is an integral and time-honored agricultural practice (Oczek, 2000; Stein, 2005). Kloppenberg (2004), a scholar of seed research regimes, describes U.S. seed policy as,

> the continuous growth and elaboration of publicly performed research and development in a virtual vacuum of private investment. Global plant germplasm collection was initiated by the U.S. Patent Office in 1839. Thus was established a powerful tradition of state commitment to agriculture in general and plant sciences in particular. (p. 12; see also Blair, 1999; Kloppenberg, 2004; Stein, 2005)

This commitment to germplasm collection, however, was not initially a government initiative, but rather can be traced to the seed exchanges made between Indigenous Peoples and colonists. Although Indigenous knowledge gave European settlers their start, settlers took not only Indigenous seeds but Indigenous land as well to further agricultural research (Kloppenberg, 2004; Lyon et al., 2021). Land-grant universities, created and supported by the passage of the Morrill Act in 1862 and the Hatch Act of 1887, resulted from this dispossession. Additionally, the U.S. passed the Smith-Lever Act in 1914 to ensure access and distribution of information to farmers via Cooperative Extension Services (Kloppenberg, 2004). Much criticism remains, however—and rightly so—of the past and continued appropriation of Indigenous knowledge, seed genetics, and land, with strong arguments that the very survival of historical data and environmental biodiversity rest upon the recognition and protection of the Indigenous peoples' integral role in the seed rights regime (McCune, 2018; Posey, 1990).

While free and open exchange of seeds remained the norm for some time—with the U.S. Department of Agriculture (USDA) allocating nearly a third of its budget in 1878 to seed collection and distribution—it was not long before commodification became prevalent (Stein, 2005). The first seed lobbying group, the American Seed Trade Organization, was founded in 1883. As hybridization science developed, companies exerted even more control over seed availability and planting because of the poor performance of second-generation crops grown from hybrid seed (Stein, 2005).

Modern plant-breeding research, a task granted primarily to the land-grant university system, has dramatically shifted over the past century "from being viewed as a freely exchanged public good, toward increasingly considered a product of human

invention that is owned and protected" (Luby et al., 2018, "Introduction," para. 1). While numerous plant breeders used to work at land-grant institutions, plant breeding programs and positions have experienced decline (Luby et al., 2018; Shelton & Tracy, 2017). Despite this decline, the Bayh-Dole Act of 1980 mandated that plant cultivars developed using federal funding be released through the university's technology transfer office (Luby et al., 2018). This means that land-grant systems still actively enforce or restrict access to intellectual property rights to garner royalty revenue, which is not used for supporting plant breeding research at many universities (Luby et al., 2018). More robust research-and-development departments now exist in the private sector among seed companies with internal plant breeding programs, the seeds of which are almost always proprietary (Luby et al., 2018).

In response to the increasing privatization of research, intellectual property barriers have imposed significant "impacts on the exchange of plant germplasm amongst plant breeders and what farmers can and cannot do with seeds and harvest" (Luby et al., 2018, para. 1). Seed legislation, in addition to private contractual arrangements, deters organic seed genetics research: "To be approved for commercial exchange, a new seed variety must meet the so-called DUS criteria, meaning that it must be distinct, uniform and stable in its characteristics" (Fredriksson, 2021, p. 4)—criteria not easily met by local and organic varieties.

Particularly within the organic corn seed market, researchers and farmers participating in seed breeding activities encounter barriers to access to top-quality genetics, which hinders the advancement of breeding activities. Although private seed-breeding research lends itself well to the development of commodity corn varieties, issues arise for organic farms, on which plants typically experience more diverse and higher-stress environments. Studies suggest that nearly 95% of maize varieties utilized by organic farmers "originate in conventional breeding backgrounds selected in regions with benign climates, optimal or high levels of fertility, and unconstrained use of seed and herbicide treatments to reduce insect, disease and weed pressure" (Endres et al., 2022, p. 3). Conversely, organic corn seed varieties require genetics "that are nutrient-use efficient, disease-resistant, and able to compete well with pathogens and weeds" (Endres et al., 2022, p. 3). The development of organic seed genetics is stalled especially since part of the overall corn seed market is dominated by four major biotech firms (Hubbard, 2021).

Corn breeding for the organic sector is a complex social-ecological system, similar to fisheries, forests, and water resources, that needs a framework for sharing research findings (Ostrom, 2009). Scientific knowledge is a critical component of the continuous improvement and resilience needed to sustain socio-ecological systems (Folke, 2006), especially in the face of escalating threats from a changing climate. But as described above, the social, economic, and governance settings within which organic corn breeders and researchers operate frustrate key information sharing. Knowledge, in the form of improved genetics and in the existing system, is viewed as economic power to be captured and exploited (Clark et al., 2016). This approach undermines essential elements of the resilience and adaptive systems needed for breeding in the organic sector. Levin (1998) highlighted the importance of the individuality of components and an autonomous process that selects from those components based on the results of local interactions. Unfortunately, most of these factors that would advance the sustainability and resilience of organic corn breeding are currently absent or restricted by other forces.

To combat the stronghold private firms have on the corn seed market and to advance organic corn seed genetics, several university research teams have engaged in transdisciplinary research efforts across technical disciplines. Under the USDA's Organic Research and Extension Initiative, several grants were issued to fund the study of organic corn seed breeding and systems at the University of Wisconsin, the University of Illinois, and Iowa State University, among others (National Sustainable Agriculture Coalition [NSAC], 2021). Research disciplines include expertise in seed genetic development, the social science elements of seed distribution and development, and the legal ramifications of seed sharing. While designing breeding projects, researchers have

emphasized the importance of connecting with others throughout the duration of a trial, including check-ins, reaching out to participants by phone and email, and asking participants to visit the site (Dawson et al., 2023). Robust transdisciplinary and collaborate research networks have the potential to better navigate the intellectual property thickets that might otherwise hinder organic corn seed research and breeding development. Promoting seed-sharing networks can also enhance sustainability and resiliency across the food system, as organic production is intended to "integrate cultural, biological and mechanical practices that foster cycling of resources, promote ecological balance and conserve biodiversity" (USDA, 2023, para. 1).

In addition to university research teams, nonprofit organizations like the Organic Seed Alliance (OSA) also have arisen to combat dominance by private firms. OSA, for example, specifically named market consolidation as a threat to organic innovation and has established multiple regional seed networks that "emphasize diversity, ecology, and shared benefits" (OSA, 2023, "Confronting," para. 2) in their research. In its *2022 State of Organic Seed* report, OSA identified restrictive seed-sharing agreements as both a potential barrier to organic seed research and a potential concern of plant breeders, but also highlighted their potential to be fair and reasonable tools. In particular, the OSA report suggested that provisions restricting or permitting research differ depending on whether universities or industry were utilizing the contracts (OSA, 2022).

Central to the question of what preventative elements obstruct genetic research for organic corn seed markets are these seed-sharing contracts, which fill the gap that other IP tools like utility patents do not. Scholarship identifies restrictive contracts and licensing as one of the broad issues plaguing plant-breeding and seed-genetics research and presenting a particular challenge for organics (Jenney, 2022). Under existing contracts, what restrictions are placed upon the distribution of seeds? In what ways does contractual language stifle research, especially in the university context? How does the Open Source Seed Initiative (OSSI) affect the existing research structure, and what tools or concepts might be useful to implement in contractual arrangements? This article explores these questions through the lens of the organic corn seed market in two parts. The first part briefly describes the history of U.S. seed genetics research and the intellectual property schemes that arose to guide research and development, including the establishment of the Open Source Seed Initiative. The second part describes efforts to obtain sample seed-sharing agreements and the barriers to research discovered in the context of organic corn. We conclude with a discussion of why contractual arrangements governing seed research, development, and sharing warrants further exploration in tandem with other forms of intellectual property protections.

Part I. Intellectual Property and Patent-Like Protection of Organic Seeds

Barriers to seed-saving and -sharing to control the distribution of seeds erupted throughout the 20th century, initially to help maintain quality control of seeds (Endres, 2005). Stricter regulations enforced through intellectual property rights and patent-like protection of seeds, however, also created ample opportunity for the commercialization and consolidation of seed distribution and, consequently, seed genetics. Domestically, the American Plant Patent Act of 1930 was the first to allow for the patenting of plant varieties. On an international level, patent-like protections granted by plant-variety protection legislation similarly privatized seed breeding (Fredriksson, 2021).

The intellectual property protection of seeds may take a variety of forms, all protecting slightly different aspects of seed research and dissemination. Types of protection include trade secrets, open-source pledges, Plant Variety Protect Act (PVPA) certificates, utility patents, and private contractual agreements (Luby et al., 2018). Beginning with the Plant Patent Act of 1930 (PPA), Congress allowed for the patenting of asexually reproduced plants (Brickey, 2020). In 1970, Congress permitted an additional layer of protection by enacting the Plant Variety Protection Act (PVPA), which allows for patent-like protections for plants reproducing via seeds. In its initial form, the PVPA authorized farmers to save (and resell) harvested seeds, along with granting infringement protections for research

activities (Brickey, 2020). However, subsequent amendments to the PVPA in the 1990s significantly narrowed the economic incentives for farmer-saved seed by eliminating third-party sales of saved seed (also known as "brown bag" seed) and limiting saved seed only for personal use (Chen, 2014; Endres, 2005).

The landmark case of *Diamond v. Chakrabarty* in 1980 held that living organisms could be protected under a utility patent so long as they were human-made and not naturally occurring (Endres, 2005). This propelled the seed industry into a new realm of intellectual property protections as seed developers preferred the stronger intellectual property protections afforded by utility patents relative to PVPA certificates and the accompanying saved-seed exceptions (Chen, 2014). While the development of genetically engineered crops was increasing, so too were the opportunities for private companies to patent the materials (Center for Food Safety [CFS], 2023). The passage of the Bayh-Dole Act in 1980 "allowed public institutions to obtain patents on publicly funded research and spurred the initiation of public-private partnerships, where industry funds public research to advance their own goals and often appropriates the resulting technology" (CFS, 2023, para. 5).

This philosophy and temporary reality of publicly funded research, however, was eclipsed by the rather sudden consolidation of the seed market that followed (Sumpter, 2021). The 1990s and 2000s witnessed significant merger and acquisition activity among the larger seed companies. By 2009, six firms dominated seed sales: Monsanto, Bayer, Syngenta, Dow, DuPont, and BASF (Torshizi & Clapp, 2021). Less than a decade later, further consolidation left only four: DowDuPont, ChemChina, Bayer, and BASF (Sumpter, 2021; Torshizi & Clapp, 2021). Congressional concern has recently been expressed over this exact issue: "In the United States, the [four] largest corn seed sellers accounted for 85% of the market in 2015, up from 60% in 2000" (Sumpter, 2021, p. 634).

Utility patents offer the most stringent levels of protection due to their 20-year duration and ability to prevent experimental use of the patented product (Chen, 2005; Endres, 2005). Alternatively, trade secrets protect developer methodology, an important research component in the development of hybrid plant varieties (Endres, 2005). For corn seeds in particular, farmers must purchase new corn seed for each growing season because hybrid seeds lack resiliency and repeatable viability over generations. (Fitzgerald, 1993). In combination with this single-use nature of hybrid corn, trade secrets protecting parent seed genetics inherently involve measures to ensure profitability, which only amplifies the capitalist nature of intellectual property regimes controlling seed breeding and sharing (Endres, 2005; Jenney, 2022). Numerous lawsuits consequently arose involving seed companies fighting over the ownership of parent lines of hybrid corn (Endres, 2005).

The complexities of overlapping intellectual property rights can present significant obstacles to routine business transactions such as seed sales. To streamline the process, farmers, seed breeders, and the owners of the intellectual property resort to licensing and other contractual arrangements (Endres, 2005; Smulders et al., 2021). These agreements, however, often contain language that protects the rights of the intellectual property owner at the expense of further research and development of seed genetics for organic and other diverse varieties (Endres, 2005). Because relatively few large corporations own the intellectual property rights to most conventional corn seed, seed legislation and contractual arrangements regularly favor research targeted at aspects of resiliency like germination availability and resistance to disease over biodiversity that might optimize the development of improved organic varieties (Fredriksson, 2021). As a result, although studies have revealed that an increasing number of organic farmers are using organically produced seeds (Luby et al., 2018), the research and development for those seeds often is not tailored to use in organic production systems. Recent funding efforts by USDA's National Institute of Food and Agriculture (NIFA) are attempting to address the research gap (NSAC, 2021). Meanwhile, the use of non-organic seed in organic production is an intentional loophole initially intended to address concerns about the inadequate supply of certified organic seed, but through its implementation has proven to also obstruct genetic development (Endres, 2022).

From the perspective of land-grant universities seeking to further plant breeding research, in particular, research on organic corn seed genetics, liability issues remain prominent for the experimental use of seed. The introduction of utility patents to the seed realm and the shift away from PVP certificates significantly restricted research flexibility. The broad intellectual property protections embedded in utility patents prohibit research derived from patented seed that may have commercial implications. This would include equivalents or even new varieties derived from seed subject to a utility patent (Endres, 2005). In 2002, the Federal Circuit in *Madey v. Duke* "held the research exception does not shield universities from liability when 'the act is in furtherance of the alleged infringer's legitimate business and is not solely for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry'" (p. 1362). Although blanket research exceptions garner well deserved criticism for running contrary to the theoretical underpinnings of intellectual property's role in advancing scientific discovery (Chen, 2005), inflexible intellectual property rights may work against the public interest in some parts of the agricultural context; as noted by Brickey (2020), "Agricultural innovators are not competing to develop 'a better mouse-trap' or build the next iPhone. Instead, the results of their innovations may increase access to a basic human necessity" (p. 300).

In response to increasingly consolidated and exclusive intellectual property rights in the seed market, the Open Source Seed Initiative (OSSI) was founded in 2012 (OSSI, 2023a). OSSI's goal "is to continuously enlarge the pool of crop varieties that are 'OSSI-Pledged,' and so are freely available for use and improvement by farmers, gardeners and breeders without encumbrances" (OSSI, 2023a, para. 5). As of 2021, OSSI lists over 350 seed varieties that are available from 51 OSSI Seed Company Partners (OSSI, 2023a).

Particularly relevant to seed breeding research at land-grant universities is the lack of a research exemption for patented seed varieties. Utility patents restrict the ability to develop new varieties derived from patented seeds. PVP certificates provide patent-like protection for sexually reproduced plants but also afford research exemptions "to breed new varieties of seed and for any 'bona fide' experimental purpose," which includes use "'in a breeding program to develop new commercial varieties,' at least as long as such new varieties are different enough not to be 'essentially derived' from the original protected variety" (Winston, 2008, pp. 324–325; see also Chen, 2005). PVPA notably does not provide as stringent protection as utility patents, however, and thus PVPA protections are generally not preferred by agricultural innovators (Winston, 2008).

The relative strength of utility patents compared to PVPA as a protection of intellectual property is a key point of contention in the seed-sharing debate. As stated on the OSSI website, "Patented and protected seeds cannot be saved, replanted, or shared by farmers and gardeners. And because there is no research exemption for patented material, plant breeders at universities and small seed companies cannot use patented seed to create the new crop varieties that should be the foundation of a just and sustainable agriculture" (OSSI, 2023b, para. 2). Although an open-source approach has proved inviable with respect to patented seeds, strong public relations efforts have bolstered OSSI's prominence.

OSSI employs "copyleft" commitments to maintain free and open development of seed varieties, offering an alternative to the constrictive contractual and legislative impediments facing organic seed genetics research (OSSI, 2023a). The copyleft principle, originally coined in the field of software development, attempts to provide both "moral and legal force" to seed breeding (OSSI, 2023a, para. 3). Copyleft concepts applied to seed breeding would mean:

- "Varieties may be used by anyone,
- "The user is allowed to change / develop the varieties,
- "The user may multiply varieties and pass them on to others, and
- "Any new variety developed from the variety under *copyleft* would be subject to the same rules (the 'viral' clause)." (Kotschi & Wirz, 2015, p. 13)

Studies are still assessing the impact, if any, of

the open-source seed movement on the organic seed market. At the time of this article, there is only one study that examines how various open-source strategies affect the freedom of breeding and sharing seeds (Beck, 2011). Although OSSI's pledge and copyleft principles still require much research, scholars of the open-source seed movement suggest particular avenues ripe for exploration, such as the viability of enforcing open-source seed licensing and genetics (World Intellectual Property Organization [WIPO], 2023). For example, German civil law allows for a material transfer agreement that employs copyleft principles (WIPO, 2023). One scholar of seed-sharing regimes, Martin Fredriksson (2021), has suggested additional research to explore the political significance of open-source seed initiatives and whether there is an associated impact on national or international laws regarding seeds. As a contribution to this line of research, this article will examine efforts to identify and analyze U.S. seed-sharing agreements and the impact of their arrangements on the organic seed industry.

Part II. The Search for Seed-Sharing Agreements

There is vibrant discussion within the organic seed research and development community over contractually arranged rights and restrictions placed upon organic seed research and distribution (Luby et al., 2018), but data supporting these struggles is difficult to obtain because of the closely guarded and private nature of contracts. Contracts for seed research are individualized and negotiated between the plant breeder and the institution supporting the research conducted, utilizing sensitive financial and personal data that participants are hesitant to share, let alone make publicly available online. Due to their private nature, contractual language generally becomes available to the public only upon instigation of litigation and the attendant discussion by the court regarding the contractual rights and obligations that are otherwise shrouded by confidentiality clauses (Lee et al., 2021). Current studies assessing seed-sharing contracts thus far indirectly asked questions about contractual arrangements via a survey and have drafted contract designs to utilize rather than relying on collection and review of existing contracts in use (Veettil et al., 2021). To assess what contractual and intellectual property restrictions may stifle organic seed development, we utilized the following methodology.

We first looked to case law to assess the current landscape of seed-sharing intellectual property rights and agreements in the context of land-grant university research. We found little on the issue. We utilized databases such as Westlaw and LexisNexis, two primary legal research repositories, to search all U.S. jurisdictions for federal and state litigation concerning organic seed research agreements with land-grant universitates dictating intellectual property rights among other contractual rights and obligations. We also conducted a general search for litigation discussing intellectual property rights, seed-sharing agreements, and land-grant universities. The search did not yield cases relevant to the university research and seed-sharing context. The scant results of case law research indicate that organic seed research occurring in breeding networks involving land-grant universities is not a topic of litigation garnering judicial attention, which indicates that to the extent there are disputes, they are resolved through private negotiations or court settlement prior to a trial verdict.

Next, we searched the academic literature on seed-sharing agreements and intellectual property rights. We utilized HeinOnline, Google Scholar, JSTOR, and other relevant scholarly databases to search for literature discussing seed-sharing agreements, IP, land-grant universities, and organic plant and corn breeding research. The search incorporated a detailed search for discussion surrounding organic corn breeding and seed-sharing agreements governing its development, but did not find sources. This search was done using key words like "seed sharing," "seed agreements," "plant breeding," "organic," "research," "symposium," "contract," and "intellectual property protection" and was aimed at searching for domestic results rather than discussion of international efforts.

The literature discussing organic corn seed focuses on the varieties developed and the methodology for the research and production or the benefits of performance in organic versus conventional systems (Lorenzana & Bernado, 2008; Shelton & Tracy, 2015; Zystro et al., 2020). Additionally,

while there is much scholarly discussion surrounding general seed intellectual property rights (Borowiak, 2004; Mascarenhas & Busch, 2006; Smulders et al., 2021; Stein, 2005), direct discussion of seed-sharing agreements in the university context and for organic corn in particular is not available. This indicates the need to further explore methods and opportunities to unlock private contracts that might provide greater understanding of the legal and economic landscape.

Finally, we searched other general online search databases including Google to identify any extension work, symposiums, or materials not captured in searching legal databases and journal repositories. Information from symposiums and other academic materials appear to follow the same line as legal scholarship and cases in terms of availability but have the potential to provide additional data. Symposium information in legal and scientific fields, while not peer-reviewed, is generally proffered by experts in their respective fields, lending reliability to the data presented. This search was done utilizing key words like "seed sharing," "seed agreements," "plant breeding," "organic," "research," "symposium," "contract," and "intellectual property protection" and was aimed at searching for domestic results rather than discussion of international efforts. Again, the presence of the contracts was confirmed but details were unavailable or omitted. This search yielded one guideline for cultivar release (University of Florida) but did not detail the rights and obligations as a seed-sharing agreement would.

Webinars discussing seed-sharing agreements and organic plant breeding were few but present. For example, eOrganic at Oregon State University was the primary search result and was one of the only results dedicated to plant breeding, intellectual property rights, and contract arrangement. eOrganic hosted several webinars discussing seed intellectual property rights yet did not comprehensively discuss the vital nature of seed-sharing agreements. In describing the 2022 National Organic Research Agenda, Dr. Thelma Velez advocated for a revision of the PVPA to protect sexually reproductive plants (Velez, 2022). She also argued that patent law should be reformed to exclude living organisms, including seeds, plants, plant parts, and genetic traits. However, none of this content covered seed-sharing agreements in the university context. Work by the Organic Farming Research Foundation (OFRF) in connection with USDA represented the other search results. An OFRF webinar discussing organic plant genetics and intellectual property rights emphasized the important role that seed-sharing agreements play in the agricultural intellectual property rights sphere and specifically identified agreements between universities and plant breeders as a point of improvement (in overall fairness of terms) (Schonbeck, 2023). Another webinar, hosted by the National Center for Appropriate Technology (NCAT), also highlighted contractual agreements governing seed sharing as worthy of research exploration, particularly examining terms and conditions that limit breeding and research (NCAT, 2020). Overall, contractual arrangements dictating rights and obligations in organic seed research are regularly identified as a crucial component of intellectual property structures that control seed genetics, but the concept is rarely explored further than that. This lack of further detail is likely due to difficulty in obtaining or reluctance in sharing explicit contract language, terms, and agreements.

Part III. Concluding Thoughts

Organic seed research and breeding is premised upon sustainability, a concept that may be at odds with the existing intellectual property regimes described above that focus on profit and confidentiality. Sustainability requires resilience and continuous improvement. Diversity, modularity, knowledge sharing, feedback mechanisms, leadership, and trust are some of the conditions enabling such resilience (Folke et al., 2016). For those involved in organic research, production, distribution, and consumption, these are familiar principles and aspirations. Moreover, Article 1, Section 8, Clause 8 of the U.S. Constitution provided Congress the power to develop intellectual property regimes to "promote the Progress of Science and useful arts." Again, this echoes the goals of the organic seed-breeding community to advance development of genetics appropriate for the heterogeneous nature of organic agriculture. Yet in its current manifestation, intellectual property rights,

coupled with restrictive seed-sharing agreements, appear to serve a contrary purpose as genetics with potential benefit to the organic sector are relegated to the locked storerooms of private firms focused on the larger-scale conventional or genetically engineered corn seed markets. As a result, many in the organic community feel trapped in a system that demands innovation, diversity, trust, and knowledge sharing, but has external structures limiting their ability to access needed resources.

This article is an attempt to identify some of the legal-structural factors that may hinder advancements in organic corn breeding through an examination of the contractual language governing organic seed research and breeding, which the organics community has identified as a relevant and crucial component of the intellectual property protections that can stifle development. But, as noted, the lack of reported case law and scholarship in the area indicates a need to further investigate the structure of private seed-sharing contracts for multiple organic products through more robust investigative measures and to explore the development of alternative pathways to promote resilient and sustainable organic seed-breeding networks. Whether action comes through the efforts of grassroots organizations, like those of the National Sustainable Agriculture Coalition, or formal federal action via legislation like the farm bill, it is clear that the organics community requires the promotion of a community-based and community-forward approach to seed sharing, research, and breeding.

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"We need a better system": Maryland crop growers' perspectives on reducing food loss through donation

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Abstract

The donation of unharvested or unsold crops to rescue organizations has been promoted as a strategy to improve healthy food access for food insecure households while reducing production-level food loss and waste (FLW). In this study, we aimed to assess the motivations, barriers, and facilitators

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for crop donation as a FLW reduction strategy among Maryland farmers. We interviewed 18 Maryland-based food producers (nine frequent crop donors and nine infrequent, by self-report) in 2016 – 2017, soliciting their perspectives on crop donation motivators, process feasibility, and interventions aimed at increasing crop donation. The interviews were thematically coded. All respondents were aware of crop donation as an option, and most expressed interest in reducing FLW by diverting crop surpluses for human consumption. While financial barriers represented one aspect influencing donation decisions, respondents also cited convenience, process knowledge, and liability as key considerations. In contrast to frequent donors, many of whom considered donation a moral imperative, some infrequent donors questioned the expectation that they would donate crops without compensation. Both frequent and infrequent donors were aware of pro-donation tax incentives, and infrequent donors reported being unlikely to use them. This research demonstrates that crop donation motivations, barriers, and facilitators can be diverse. Given the existence of crop surpluses and their potential benefits as emergency food, our results suggest that multiple interventions and policies may contribute to incentivizing and facilitating crop donation (or enabling the purchase of surplus crops) rather than one-size-fits-all approaches. Our findings also highlight a need to prioritize crop recovery methods that enhance growers' financial stability.

Keywords
Food Waste, Food Loss, Food Rescue, Emergency Food, Crop Donation, Food Production, Farming, Worker Health, Food Insecurity, Gleaning, Donation Tax Incentive

Introduction

Increasing evidence of widespread food loss and waste (FLW) throughout the United States (U.S.) food supply chain, coupled with supply chain challenges during the COVID-19 pandemic, has highlighted the benefits of recovering surplus food at all supply chain levels, including farms (C. Campbell & McAvoy, 2020; Hall et al., 2009; Mansoor, 2020; ReFED, 2018). In Maryland in 2017, approximately 12,400 farms on roughly 1.4 million acres grew crops that included vegetables, fruits, nuts, and berries (U.S. Department of Agriculture National Agriculture Statistics Service [USDA NASS] 2019). The quantity of these crops that were surplus (i.e., went unharvested or unsold) is unknown (USDA NASS, 2019), but estimates suggest up to 17 million tons of crops planted for human consumption are lost annually at the farm level (ReFED, n.d.-a). In response to this, donating surplus crops to rescue organizations has been promoted as a way to improve healthy food access for food insecure households while reducing production-level crop losses (Feeding America, 2020).

Background on Farm-Level FLW

Farm-level FLW represents an under-researched area in the U.S. Key research gaps include the extent and character of farm-level FLW, evaluations of rescue program, and how best to reduce FLW by supporting farmers to donate surplus crops (Baker et al., 2019; D. Campbell & Munden-Dixon, 2018; Gillman et al., 2019; Harvey et al., 2022; Hecht & Neff, 2019; Johnson et al., 2019; Kinach et al., 2020; Soma et al., 2021; Spang et al., 2019).

Governmental U.S. FLW estimates currently exclude farm-level losses (Buzby et al., 2014), meaning that these estimates may be systematically undervalued (Johnson, Dunning, Gunter et al., 2018). Several peer-reviewed studies have quantified local and regional production-level FLW in the U.S., documenting substantial variability by crop type, growing method, market demands, and geographic location. Mean unharvested or unused salvageable crop estimates range from 16% on vegetable and berry farms in Vermont (Neff et al., 2018), to 31.1% on conventional crop farms in California (Baker et al., 2019), to 42% on vegetable farms in North Carolina (Johnson, Dunning, Bloom, et al., 2018). An investigation across multiple states found that 40% of fresh tomatoes, 39% of fresh peaches, 2% of processing potatoes, and 56% of fresh romaine lettuce (Pearson et al., 2018) were lost. Such losses occur for many reasons, including intentional overproduction given the many uncertainties farmers face from natural and market forces (Johnson et al., 2019). These find-

ings, and the suggestion that more farm-level FLW occurs than was previously thought, have piqued interest in better recovery and use of these crops.

It is known that farm-level losses can negatively impact growers' financial viability (Papargyropoulou et al., 2016), which in many cases is already precarious. U.S. farming households' annual median on-farm income (US$210 in 2021) has recently gone from nominal to negative profits (-US$661 forecasted for 2022), and most U.S. growers consequently supplement their incomes with off-farm activities (USDA Economic Research Service [USDA ERS], 2022). Research links this financial uncertainty to increasing mental health issues and suicides in the farming community (Reed & Claunch, 2020).

Crop Rescue and Food Insecurity

The nongovernmental organization ReFED's national FLW loss model estimates that overall, only 1.6% of farm-level surplus is rescued in the U.S. (ReFED, n.d.-b), although this estimate excludes an unknown amount of crops that are "gleaned" (i.e., collected from fields after the harvest, usually by volunteers [Center For Health Law and Policy Innovation, Vermont Law School Center for Agriculture and Food Systems, & Association of Gleaning Organizations, n.d.; ReFED, n.d.-b]). While crop donation is not the solution to food insecurity, the loss of salvageable crops occurs simultaneously with high food insecurity rates. In 2021, approximately 10.2% of U.S. households were classified as food insecure, with over 640,180 people experiencing food insecurity in Maryland (Coleman-Jensen et al., 2021; Maryland Food Bank, 2022). Many food banks and rescue organizations have begun prioritizing offering healthy, fresh foods to clients (E. C. Campbell et al., 2013; Martin, 2021).

In part to meet this need, Maryland Food Bank's (MFB) Farm to Foodbank program rescued 2.5 million pounds of crops in 2021 (Maryland Food Bank, 2021). This program, initiated in 2010, aims to facilitate donation throughout Maryland by providing donation packaging and other resources, organizing field gleaning events, and providing donation pickups (Maryland Food Bank, 2020). The program also contracts with growers to produce crops specifically for Maryland Food Bank. The MFB then distributes produce to food pantries, soup kitchens, schools, and shelters, and uses the produce in their in-house FoodWorks culinary training program (Maryland Food Bank, 2020). This local program predated the federal Farm to Foodbank Program, which started in 2018 and distributes federal funds to states that are used to defray crop donation costs (such as transportation, organization of gleaning activities, packaging, and other costs) (USDA, 2021).

While rescue organizations frequently solicit surplus crops for donations, it is worth noting that crop donations are not exclusively composed of surpluses or crops that would otherwise become FLW. This is demonstrated by the MFB Farm to Foodbank program's contracts with local growers, who produce crops for the MFB to purchase (Maryland Food Bank, 2020). Additionally, not all undonated surplus crops must become FLW. Many surpluses are edible and can be sold in secondary markets, upcycled, preserved, or otherwise repurposed for human consumption (ReFED, n.d.-b). Other surplus crops that are inappropriate for human consumption, including those damaged by weather or those that have begun to rot, can be used as animal feed, to generate energy, or to supplement farm soil as compost (Gillman et al., 2019).

In the interest of both reducing FLW and addressing food insecurity, a growing literature explores the landscape of crop surpluses and donations in high-income countries (D. Campbell & Munden-Dixon, 2018; Gillman et al., 2019; Janousek et al., 2018; Johnson et al., 2019; Johnson, Dunning, Bloom, et al., 2018; Neff et al., 2018). Their findings emphasize that production-level FLW often occurs due to circumstances beyond growers' control, including market and weather volatility (D. Campbell & Munden-Dixon, 2018; Johnson et al., 2019; Neff et al., 2018; Soma et al., 2021).

A few studies evaluate specific aspects of rescue programs or assess producers' reasons for participating (Harvey et al., 2022; Hecht & Neff, 2019; Johnson et al., 2019; Kinach et al., 2020; Soma et al., 2021). Findings suggest that reducing farm-level FLW through donation is one option of many, and that not all situations merit recovering food for

human consumption. Some studies examining current donation programs have found that donating low-quality, perishable foods burdens recipient organizations with their disposal (Hecht & Neff, 2019), and that culling losses at the farm level may reduce their environmental impacts in comparison with the retail or consumer levels (Gillman et al., 2019). Research examining policies geared toward increasing crop donations has found that strategies like tax incentives may differentially benefit or appeal to crop producers (Kinach et al., 2020; Soma et al., 2021).

Maryland's Agricultural Context

Despite agriculture representing Maryland's largest commercial industry, it is small in comparison to other states, contributing only 1% of the United States' agricultural sales by value (USDA NASS, 2019). Maryland contains a sizable poultry production industry, concentrated mostly on the eastern shore of the Chesapeake Bay, which generates approximately half of the state's agricultural sales by value (USDA NASS, 2019). In contrast, crops contribute approximately 38% of the state's agricultural sales by value and are grown on approximately 1.53 million acres throughout the state (Maryland State Archives, 2021).

Table 1 presents information on the farming industries for the three counties represented in this study, compared to the rest of the state and the nation. Charles, St. Mary's, and Calvert counties, located on the southernmost tip of Maryland's Western Shore peninsula, are bordered by the Chesapeake Bay and the Potomac River. They are considered relatively rural, although within geographic proximity of two major food banks: the Capitol Area Food Bank (serving the metropolitan Washington, D.C., region) and the Maryland Food Bank (serving the state of Maryland). Farming operations in southern Maryland are supported by the Southern Maryland Agricultural Development Commission (SMADC), which was created by Maryland legislators in the year 2000 to help growers transition from tobacco production to other farming models (SMADC, n.d.). SMADC continues to support and promote southern Maryland farming and diversification by providing training, research, grants, technical and marketing assistance, and information regarding laws and regulations affecting growers. Their board includes active farmers, legislators, business consultants, and other stakeholders (SMACD, 2023).

Local and National Donation-Related Policies

In recent years, state and federal legislators have undertaken policy efforts to facilitate crop donations. In Maryland, these include a tax incentive program enacted in 2017 whereby growers can earn a state income tax credit worth 50% of eligible donated food's value, or 75% for certified organic

Table 1. Selected Information Describing Agricultural Industries in the Three Maryland Counties (2017) Represented by Study Respondents, the State of Maryland (2017), and the United States (2023)

	Total # of farms	Average farm size, in acres	Net cash farm income, per-farm average (US$)	Market value of crops sold (US$)
Charles County[a]	385	107	–$1,957	12,439,000
St. Mary's County[a]	615	100	$5,941	20,465,000
Calvert County[a]	280	90	–$7,256	5,701,000
State of Maryland[a]	12,429	160	$52,997	948,125,000
United States	2.00 million[b]	440[b]	$92,400[b]	Approximately 150 billion[c]

[a] USDA National Agricultural Statistics Service [USDA NASS]. (2019). *2017 state and county profiles—Maryland*. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Maryland/index.php
[b] USDA Economic Research Service [USDA ERS]. (2023, March 14). *Farm and farming income*. https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/farming-and-farm-income/#:~:text=In%20the%20most%20recent%20survey,million%20acres%20ten%20years%20earlier
[c] USDA ERS. (2023, February 7). *Net cash income 2014–2023F*. https://data.ers.usda.gov/reports.aspx?ID=17831

donations, up to US$5,000 (Income Tax Credit—Qualified Farms—Food Donation Pilot Program, 2017).

Additionally, Maryland law offers limited liability protections for growers who allow gleaning to recover crops on their operations (Md. Code Ann., Cts & Jud. Proc. § 5-404(b) Farmers and Gleaning, 2023). Similar liability coverage at the federal level through the 1996 Bill Emerson Good Samaritan Act absolves U.S.-based good-faith food donors from liability related to foodborne illness (Bill Emerson Good Samaritan Food Donation Act, 1996). Little is known about growers' perspectives regarding the utility of these tax incentives or liability protections in encouraging donations.

Given the complexity and diversity of challenges faced by farmers and the need to better characterize opportunities around FLW and donations, researchers have called for more place- and crop-specific studies (Soma et al., 2021) examining these issues. This qualitative study adds insights to a growing literature by examining crop growers' views on reducing farm-level FLW through donation in the U.S. Mid-Atlantic state of Maryland. While many studies about crop donations include only respondents who actively participate in donation programs, or do not describe respondents' donation habits (Kinach et al., 2020; Soma et al., 2021), we provide evidence from both frequent and infrequent donors and compare their perspectives about donation processes. Our results provide a contrast of farmers who choose to donate versus those who do not, and enhance a nuanced understanding about how these growers view donation feasibility, processes, and policies. We also identify priorities for future research and interventions, including needs to support crop recovery methods that enhance growers' financial stability.

Methods

Recruitment

We collaborated with the SMADC to recruit professional farmers from Maryland. We conducted two rounds of recruitment via telephone using purposive chain sampling from February 2016 to August 2017. For the first round, we recruited farmers (n = 9) who self-reported that they actively engage in crop donation using a list provided by SMADC. In the second round (completed in summer 2017), we recruited participants (n = 9) who self-reported that they choose not to donate or donate minimally. We included participants who were over the age of 18, spoke English, and who farmed or owned farmland in St. Mary's, Charles, or Calvert County, Maryland, U.S. In total, we approached 42 individuals, and 18 agreed to be interviewed.

Interviews

The semi-structured interview guide gathered information about current crop donation participation, perceived benefits and challenges related to crop donation, and a Maryland tax incentive (Income Tax Credit—Qualified Farms—Food Donation Pilot Program, 2017). We amended the interview guide through an iterative process guided by tenets of grounded theory, to focus on facilitators and barriers of donation (Charmaz, 2006). Researchers conducted interviews in English either in person at informants' farms (n = 6) or via telephone (n = 12). The first round of data collection occurred in February and March 2016, and the second round occurred in June and July 2017. Each interview was audio recorded and transcribed.

Data Analysis

We used MAXQDA (VERBI Software, 2018) for data management and analysis. First-round coding took place in four phases: (1) initial deductive code development; (2) independent coding by two researchers using inductive line-by-line coding (Charmaz, 2006); (3) codebook discussions and revision based on emergent themes and concepts; and (4) codebook finalization. The final codebook contained 12 codes categorized under seven themes and was used to code all interviews. Inter-rater reliability was assessed based on double-coding a single transcript. Any coding discrepancies were discussed and resolved by the team (Saldaña, 2015). Second-round coding was conducted using the established code book, and first-round sample findings were compared to second-round sample findings to identify differences between frequent and infrequent donors by self-report.

After coding, the researchers extracted and organized the data by categories, which were then reviewed using constant comparisons between and within texts to identify key themes (Saldaña, 2015). Throughout data collection and analysis process, the research team kept analytical memos to record emerging ideas, themes, and reactions (Saldaña, 2015).

This project was deemed nonhuman subjects research by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Results

Respondents (N = 18) came from for-profit farms (n = 15) and nonprofit farms (n = 3). Seven were farm owners, two were farm workers, and one was a farm manager. Nine participants were frequent donors by self-report, and nine were infrequent donors. Respondent characteristics are further summarized in Table 2. In summary, in contrast to frequent donors, some of whom exhibited nonprofit or hybrid business models, infrequent donors were all for-profit growers. Infrequent donors reported having relatively smaller operations by acreage than frequent donors. The sample of infrequent donors also contained more organic producers than the sample of frequent donors.

Descriptions of Crop Loss

Farmers in both donation categories discussed an aversion to crop FLW due to the money, time, resources, and personal investment involved in crop production. Causes cited for FLW included spoilage, weather, "overplanting," customers' demands for "perfect" (i.e., cosmetically appealing) crops, seasonal demands for growing space, competing time demands, and "bumper crops" that flood the market. FLW estimates varied from about 20% of all crops planted to less than 5%, and growers frequently stated that the results differed based on crop type and other factors. For example, one grower stated that FLW "varies wildly by crop," and "it's hard to tell, obviously, if you don't harvest it, how much is out there."

Respondents identified multiple strategies they use to reduce FLW, including preserving excesses to eat themselves, giving food to their workers, feeding crops to farm animals, composting or tilling crops back into the soil, and donation. Respondents pointed out the benefits and simplicity of employing practices that upcycle nutrients for reuse on the farm. As one frequent donor explained, "you give [surplus crops] to your livestock … and turn that surplus into meat or eggs … [which] keeps so much better than a beautiful perfect cantaloupe."

Overview of Themes

Interviews revealed three dominant themes related to reducing FLW through donations, including growers' perspectives on (1) existing facilitators of crop donation, (2) existing barriers to crop donation, and (3) suggestions about how to facilitate

Table 2. Respondent and Farm Characteristics by Self-Report, by Recruitment Period

	Round 1	Round 2
Total, *n* (%)	**9 (100)**	**9 (100)**
Size in acres, mean (range)	179 (1–365)[a]	33 (5–100)[b]
Products		
Crops only	5 (55.6)	5 (55.6)
Crops and livestock	4 (44.5)	4 (44.5)
Growth method, *n* (%)		
Conventional	5 (55.6)	2 (22.2%)
Organic	4 (44.5)	7 (77.8%)
Business model, *n* (%)		
For-profit	5 (77.8)	9 (100)
Nonprofit	3 (16.7)	–
Hybrid	1 (5.6)	–
Frequent donor by self-report	9 (100)	–

Percentages may not total 100 due to rounding.
[a] Two first-round respondents are missing acreage estimates.
[b] One second-round respondent is missing acreage estimate.

donation. We provide a summary of these themes in Figure 1 below, along with specific examples from each category.

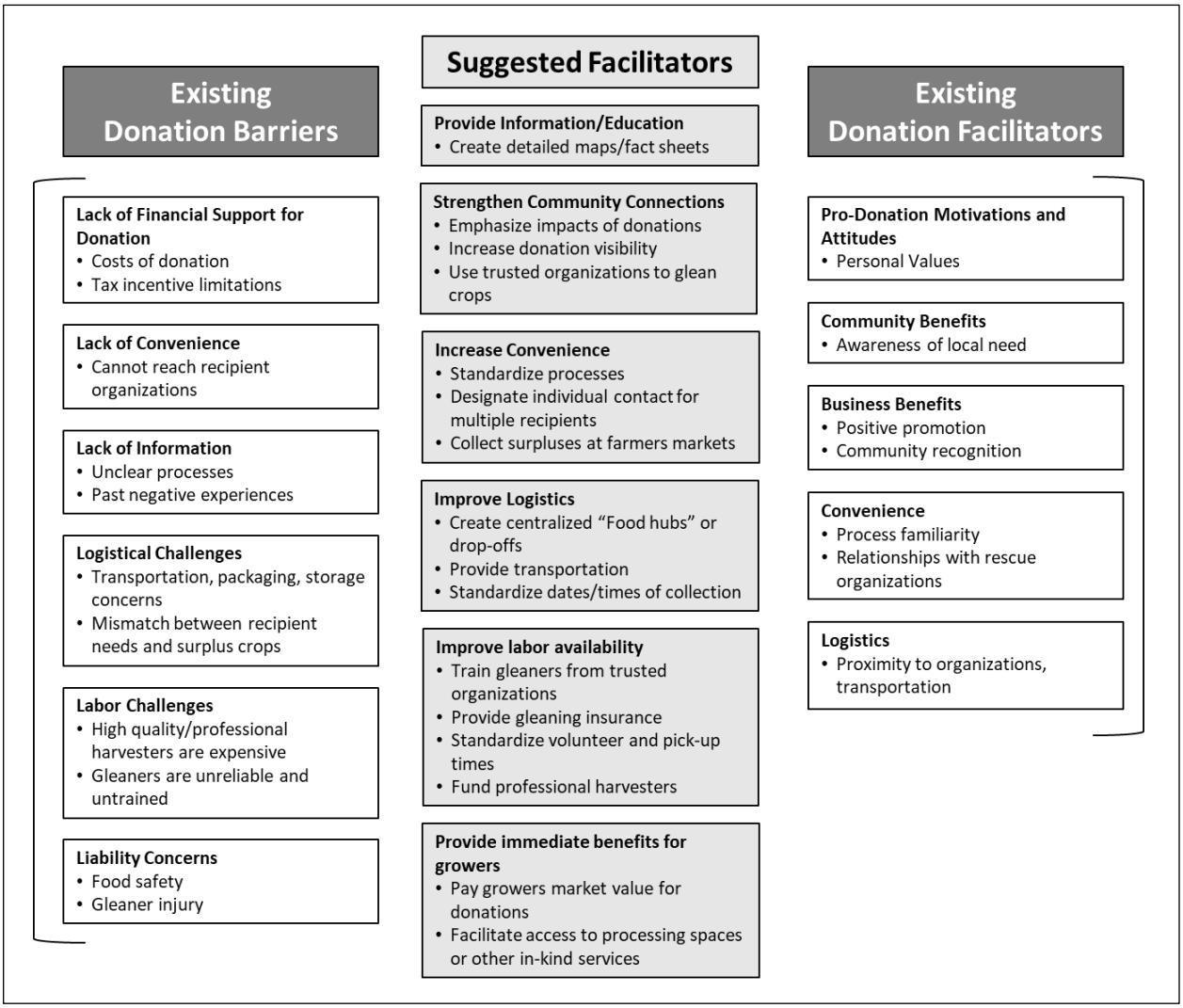
Facilitators of Crop Donation

Pro-Donation Motivations and Attitudes

Personal Values: Both nonprofit and for-profit frequent donors expressed moral motivations, stemming from a desire not to waste food, combined with a moral conviction that donation is "the right thing" to do. A few for-profit growers prioritized donation even when it cost resources or diminished profits. These growers felt donation fits into an ethical framework that dictates that growers care for one another, their land, and "the next generation." Even though a frequent donor acknowledged that "the farmer and his family are struggling, too," the respondent affirmed that "even though times are tough, the farmer always wants to help people in the community."

Community Benefits: Similarly, the desire to address community food insecurity represented a deciding factor in some growers' choices to donate. One frequent donor, who had previously declined to donate, described undergoing an attitude shift upon witnessing the line outside her local food

Figure 1. An Overview of Crop Donation Barriers, Existing Facilitators, and Suggested Facilitators for Crop Donation Reported by 18 Maryland-Based Crop Growers, 2016–2017



bank. She stated, "Any one of them could have been my family members. … I was just floored that there was that kind of need for [emergency food]." Many frequent donors described transformative insights into the scope of hunger, especially in their local communities, as a driving force for overcoming donation hurdles: "We never even really thought about … the poor, the needy, or anything like that … until it was brought to my attention that there is a need." The same frequent donor described growing food "specifically for the hunger community," and hosting volunteer harvesters from addiction and recovery programs, which allowed his operation to provide support beyond food (e.g., job training), and thus, in his opinion, to address broader social needs.

Business Benefits: The perceived business benefits of donation mentioned by frequent donors included positive public relations, farm promotion, and community recognition, although these were never the only reasons for donating. Not all growers valued public recognition; for example, one frequent donor described it as inconsequential, saying, "I'm not doing it for credit and I'm not doing it to impress you or anybody else."

Convenience

Most respondents, regardless of their donation frequency, knew about donation as an option and had investigated it previously. Both frequent and infrequent donors emphasized convenience as perhaps the most important donation facilitator. A frequent donor stated, "…On one side you could certainly argue that it will be nice to …, pay less taxes or get a check back. On the other hand, I think personally if donating food is convenient it's going to happen no matter what."

Among frequent donors, existing relationships with rescue organizations incentivized them to overcome convenience challenges and sometimes contribute farm resources to the process (e.g., buying boxes or transporting food to rescue organizations).

Logistics

The distance from farms to food rescue organizations came up frequently in interviews. One frequent donor described the importance of being close to a food pantry as a facilitator for donation: "It works for us logistically. It wouldn't make sense for the … Food Bank to be sending a truck and a driver from all the way up [there]. … But it is worth it for the food pantry that's about 5 minutes from here, if they send a truck and a volunteer over here to get it."

Reported Barriers

Costs of Donating: Many frequent and infrequent donors viewed donation costs as potentially prohibitive. Examples of these costs included hourly labor to harvest, sort, wash, and package crops; the expense of boxes and bags; and transportation. One frequent donor explained that even when he wanted to donate crops, the financial costs sometimes stopped him from doing so:

> I've already invested the time and the equipment and the land into growing that crop, harvesting that crop, packing it, … putting it in a box or a bag or whatever, and … then to have to … put it in a truck and deliver it when you're not getting any money for it, … you can't take that many hits.

Many infrequent donors expressed reluctance to invest their finite resources in donation. One grower described donating as counter to his primary goal of maintaining solvency,

> With small growers, we don't make much money anyway. … To spend a bunch of time and labor doing something that you ... get [a] good feeling from and you're theoretically helping your fellow man, [but if you don't earn a profit] how do you do that and be a sustainable farm?

A formerly frequent and now infrequent donor questioned the overall societal expectation to "feed the poor on the backs of farmers." This grower stated,

> The food is not free … [It] is expensive to grow. I … have issues with the whole logic train. … I can't pay my bills and I can't pay my

> employees. I can't pay myself a living wage if I'm selling my products in, say, a food desert for a quarter of the price that I would get for them elsewhere. So, I feel like we need to come up with a better system.

While other infrequent donors described a moral aversion to wasting food, they generally did not report feeling ethically bound to donate their crops and did not comment on business benefits. Some suggested it was not worth their time to donate what they considered small amounts, especially at the expense of other farm responsibilities. As one infrequent donor stated,

> If I had more, if I found myself with hundreds of pounds of produce that could otherwise be eaten, then I would feel more of an ethical/ moral obligation [to donate], … because I'm grossed out morally about food waste. … It's not that I don't feel like that's ethically significant … but at this point, it's not at the top of my list of reasons to do it.

Tax Incentive Concerns: Several respondents noted economic incentives as a potential way to facilitate crop donation on farms. When asked about the Maryland Crop Donation Tax Credit, or the utility of tax incentives generally, growers expressed various opinions about their potential effectiveness. Frequent donors viewed the tax credit as a "nice perk" that could spur action if a person was already considering donation. For instance, if one was looking for a donation site and realized the drive was longer than optimal, a tax credit could help a grower justify the expense and opportunity costs of transport. By contrast, many infrequent donors considered a tax credit insufficient as a primary motivator and raised multiple concerns, described below.

In terms of barriers to using a tax incentive, both frequent and infrequent donors noted that tracking donations and completing paperwork for this purpose incurred costs. For those with small production capacity, extra work for relatively small donation amounts would not be worthwhile, especially for a delayed reward at tax time.

Infrequent donors who were specialty and organic producers questioned the thoroughness and equity of methods to determine donation values. They argued that because their specialty crops might sell for higher prices than conventionally grown crops, they should be valued more as donations. If all crops were grouped together (e.g., heirloom "Cherokee Purple" tomatoes with regular tomatoes), the system would be unfair and unrewarding. Similarly, growers of specialty greens and other light-weight crops pointed out that determining donation value by weight would disadvantage them.

Infrequent donors with relatively small operations perceived tax incentives as targeted toward larger farms. One grower explained, "For every piece of legislation that's ever come out, it's always benefited either the Eastern Shore or the larger … hundreds and hundreds and hundreds of thousands of acres of farms. So there's nothing for the small farmer, I'll be very surprised if it helps the small farmer."

Importantly, growers pointed out that while well-intentioned, a tax credit would not serve them if they did not make enough money to pay taxes, or if their farm was not-for-profit. An infrequent donor stated that she is "on food stamps," so a tax credit would not benefit her. Another infrequent donor described the tax incentive as undesirable because it would not meet growers' immediate and substantial economic needs, e.g., "they can feed themselves, but that's all they can do. They'll have no retirement. Their kids aren't going to have any college fund. They're not going to have any healthcare." Another respondent explained frustration with any "government initiative" to increase donation that does not address immediate economic needs of smaller operations, saying "I would be irritated by it. … There should be a government initiative to let small farmers figure out a way how to make a living. I think that's more important."

Finally, some growers expressed distrust of government involvement in their lives and suggested this feeling would be widespread in the farming community, thus reducing the likelihood that a tax incentive would be well-used.

Lack of Convenience: Both frequent and infrequent donors highlighted inconvenience as a major bar-

rier to donating. One reported that the convenience challenge included contacting rescue organizations to facilitate donation. Donors reported having to contact food rescue organizations themselves, rather than the opposite, and suggested that others may not take this initial step to find out where, when, or to whom they could donate. Both frequent and infrequent donors reported instances of composting or throwing away crops intended for donation because they could not reach rescue organizations during what they considered the organizations' limited hours (e.g., 7 am to 4 pm on weekdays), or if recipient contacts took too long to respond.

Lack of Information: Although frequent donors did not find navigating the donation processes challenging, they suggested that a general lack of clarity could prevent other farmers from donating. Infrequent donors confirmed that this was often the case. One infrequent donor described her questions: "I would … want to talk to [recipient organizations] about … is what I have appropriate for their needs? I could give you a hundred pounds of turnips, but do you really want a hundred pounds of turnips? Is that useful?"

Infrequent donors cited negative experiences that reduced their trust in donation systems. For instance, one grower donated a pallet of produce to a food bank only to see it rotting there a week later. Another found out, after a year of donating, that their crops were being sold for profit without their knowledge.

Logistical Challenges: Many respondents, even frequent donors, considered current donation processes logistically challenging. An infrequent donor stated, "Farmers can only do so much. … Does [a donation] need to be washed and bagged? If [the food bank] said yes, I would just kind of go, well, forget it. That's too much trouble."

Even if growers decided to donate, they were sometimes prevented from doing so, which decreased future motivations to donate. Donors in both frequency categories described trying to donate and being turned away when weather patterns produced a "glut" of a certain crop that overwhelmed rescue organizations. A frequent donor described experiencing this barrier: "I've had [food banks] tell me, 'Oh no, we don't want that, we have enough of that. We only want these crops.' So they're very selective." Others have offered fresh crops to rescue organizations who declined them because they only accepted canned foods at that time.

Many growers described transporting crops for donation as a major barrier. For example, an infrequent donor said he had not donated because, "You've got to transport everything. … Some will come [pick up donations] but most [recipients], you have to bring it to them, then you've got issues in the travel. They haven't figured out a way to make it more donation-friendly, I guess."

Labor Challenges: Almost all respondents, regardless of donation frequency, considered it too expensive, and therefore unfeasible, to pay workers to harvest crops for donation. One frequent donor explained that she navigated these challenges by hosting triannual events where volunteer gleaners strip fields of salvageable produce. She stated, "I can't really think of any drawbacks … other than just a few extra hours each year coordinating these events. … It doesn't … mess up our crop planning or anything like that." Another frequent donor who used volunteer labor described coordination as key to their success: "It is reliable if someone structures and works with the farms to know when their harvest yield time typically is, … but if growers are unable to source gleaners when they need them, he is not going to keep calling many more times if no one shows up."

While volunteer gleaners can provide free labor, both frequent and infrequent donors described them as lacking needed skills, professionalism, or physical stamina. A frequent donor summarized his thoughts about gleaners: "I mean there are people [who] would be amazing assets and there are a lot of people who are just pure liabilities." He described carefully timing a school group gleaning event just before the first frost because, "We knew whatever damage they do [to crops], it's okay." Others noted hearing about growers' negative experiences with gleaners; for example, a frequent donor explained, "Some farmers get very upset when they open their farm to these gleaning

operations and there are water bottles and trash and stuff left at their location." An infrequent donor explained, "I'm not farming because I want to be around a bunch of people who don't know what they're doing."

Liability Concerns: Multiple growers expressed concerns about donation-related liability. This was true even among those who reported awareness of the federal 1996 Bill Emerson Good Samaritan Act. Growers also expressed concerns about selling or donating what they considered edible, safe foods because of federal food safety laws, including the Food Safety Modernization Act, noting, "In the United States what we do is we just throw it away. That's pretty much what the health department wants you to do, is to throw it away." Further, some growers feared legal liability associated with gleaners. For example, if a gleaner got injured while working or contaminated crops, growers feared lawsuits. As one grower stated, "All it takes is one gleaner with hepatitis…"

Suggested Donation Facilitators

Provide Education and/or Information: Many frequent donors offered suggestions to improve infrequent donors' attitudes toward donation. These respondents recommended educating nondonors about needs in their immediate communities and the potential impacts of their donations.

Strengthen Community Connections: Frequent donors also suggested that forging and strengthening community connections could encourage more donation. To accomplish this, frequent donors recommended increasing formal community recognition for donation, because it provides growers with a sense of pride, confirms community appreciation for their efforts, and promotes the farmer's business. One frequent donor noted that increasing donation visibility in this way could cultivate donation as a social norm, which could further incentivize nondonors.

Increase Convenience: To increase donation convenience and opportunity, several growers recommended interventions to increase donors' familiarity with recipient organizations and clarify processes. Suggestions included providing up-to-date maps and donor recipient lists on trusted websites or through trade groups. Others suggested that having a designated individual available to connect growers with multiple donation locations, organizations, and people could better facilitate donation than current practices, where they must call each potential recipient individually.

Improve Logistics: To address logistical barriers, multiple respondents suggested having a truck that drove from farm to farm on a set day each week to collect donations, to remove transportation costs and increase process predictability. Others suggested establishing a convenient location to donate, perhaps a central farm in the community that could deliver crops to recipient organizations. An infrequent donor suggested that, rather than a tax incentive, government funding should support "regional food hubs" that could provide in-kind services, like access to a commercial kitchen or other food processing space or equipment. He explained this could "solve the distribution problem…":

> … If I was a member of that food hub and I knew that I was giving them 50 pounds of free food that they were taking a write-off on, I would say, "Okay, what do I get for this?" "Well, what you're going to get is you're going to get access to the commercial kitchen we have on site for two days for free, to can tomato sauce." Well, that's great because that's what I need.

Another infrequent donor suggested that recipients go where growers are already selling crops. He described the ease of donating leftover crops at the end of the farmers market, rather than reloading them and transporting them back to the farm or a rescue organization:

> We've done the most crop donation … through our grower's market because, basically … they made it easy. [They] would come through and pick up our leftover produce. For me, that's great because it's just less stuff that I have to take home and deal with. It also is good to know that it's going to somebody who needs it.

Improve Gleaning: The growers provided several suggestions to improve available donation harvest labor through gleaning. One frequent donor suggested limiting gleaning to certain trusted organizations: "Even beyond churches and stuff, 4-H groups would have their own insurance, Boy Scout groups would have their own insurance, and again you have a closed community of volunteers that could be trained, as opposed to just kind of open to anybody." Growers also suggested standardizing volunteer and pick-up times to be consistent and predictable, and having a dedicated person to coordinate gleaning efforts, training, and providing insurance.

One nonprofit grower and frequent donor, who grows crops specifically for donation, explained that he reduces labor costs by organizing volunteers or work-release inmates to not only glean, but also to harvest crops, instead of professional laborers. He explained that this practice produces lower-quality harvests, but is acceptable because products are sold to rescue organizations. We address concerns about this in the discussion. For-profit growers felt unable to cut costs in this way, explaining that only professional laborers harvest crops in such a way that they meet customers' expectations for quality. Further, some for-profit growers expressed irritation that nonprofits undercut the crop market through this practice.

Discussion

This qualitative study adds to a growing evidence base documenting growers' perceptions and decision-making around crop donation. To our knowledge, no other study includes both frequent and infrequent donors, or growers from the Mid-Atlantic U.S. We noted several differences between frequent and infrequent donors in terms of their motivations to donate crops, perceptions of donation feasibility and familiarity with processes, and general acceptance of pro-donation policies, like tax incentives. These differences have implications for the kinds of donation interventions these groups might find most attractive or effective. We also document infrequent donors' concerns about the societal expectation to donate surplus crops without compensation. Some growers felt that this expectation not only undermines their businesses' profitability and longevity, but also reinforces the idea that excess crops have little value—when the opposite is true. Below, we present findings about how to make donation more feasible for growers who want to participate and suggest that fostering alternative, compensated avenues for reducing production level FLW could be needed.

Table 3 summarizes donation barriers identified by Maryland-based crop growers and provides a non-exhaustive list of potential responses to address these barriers.

Donation Motivations and Attitudes

Research shows that when dealing with unharvested or unsold produce, growers may choose convenient, inexpensive disposal methods that work synergistically with farm practices over those requiring extra planning or resources (Gillman et al., 2019; Johnson et al., 2019). For example, growers may compost or feed high quality crops to animals in lieu of donating them to rescue organizations to save time and money (Gillman et al., 2019). While respondents did report these practices, many also expressed the desire to reduce FLW by donating crops or otherwise upcycling them for people to eat, where possible.

Whether they are frequent or infrequent donors, many respondents emphasized the extra costs and labor associated with donating crops, often in return for little to no compensation. Despite this, many frequent donors' ethical and religious donation motivations align with those documented by Kinach and colleagues (2020), who suggested that many crop donors may consider food part of the "moral economy" and therefore donate to the extent they can, regardless of market incentives or consequences. However, some infrequent donors' frustration with the expectation that farmers provide emergency food highlights a need to develop surplus FLW interventions that support growers' economic viability, such as emergency food purchasing or secondary markets.

Despite interest in increasing donations, our results align with those of Johnson and colleagues (2019), indicating that growers commonly receive limited guidance regarding processes (e.g., what to donate; where to donate; how to measure and track

donations; and state and federal food donation safety laws; liability protections; etc.). Frequent donors' suggestions for compiling guidance on this and other donation issues with targeted education campaigns could potentially increase nondonors' agency and confidence to donate. Our findings suggest that successful campaigns could leverage leaders within farming communities and trusted groups, such as agricultural extension, to help growers access donation information. These resources might help overcome any previous negative donation experiences and could familiarize growers with donation processes, which have been reported as facilitating donations in food retail (Ceryes et al., 2021). Additionally, such guidance could prevent rescue organizations from receiving inappropriate or inedible food (Hecht & Neff, 2019).

Table 3. Barriers to Crop Donation and Potential Responses Reported by Respondents Organized According to Themes, Maryland-Based Growers, 2016–2017

Thematic Category	Donation Barrier	Potential Intervention Strategy
Motivations and Attitudes	Lack of exposure to donation benefits for recipients	• Forge relationships between recipient organizations and crop donors, including site visits and interaction with recipients • Share materials about donation impacts with farmers • Formally recognize and publicize donations to promote growers' businesses, increase donation visibility, and confirm community appreciation
	Concerns about liability	• Publicize and clarify liability protections
Convenience and Logistics	Transport unavailable or expensive	• Increase donation aggregation hubs, with refrigeration and storage • Reimburse or pay up-front for transportation costs
	Packing material costs	• Directly provide or fund donation packing materials
	Challenges identifying donation recipients (especially during widespread crop gluts)	• Improve capacity for value-adding at food hub or rescue organization • Create and distribute centralized and/or localized guidance, including donation network maps, quality standards, and accepting organizations • Increase access to rescue organizations through increased and more flexible hours • Establish and promote donation routing hotlines or apps
Labor Challenges	Lack of funding for professional labor or reliable volunteer labor	• Train a reliable and reputable pool of gleaners from trusted organizations to improve harvest quality • Compensate existing farm employees to oversee gleaners • Pay farm employees for donation-related labor or reimburse through tax incentives or other mechanism
Lack of Financial Support	Tax credit concerns	• Provide supports to encourage tax credit usage, including hired navigation helper positions and administrative support • Tailor methods for determining donation value • Promote tax credits through trusted organizations
	Inadequate benefits and financial and workload burdens for already-challenged growers	• Enhance the immediate financial and logistical benefits associated with donation • Prioritize purchasing emergency food at market value • Develop secondary markets for surpluses

In terms of policies, Hudak et al. (2022) found that donor liability protections were the most common type of U.S. state policy intended to facilitate food donations. We echo others' (e.g., Harvey et al., 2022) suggestions that clarification and education around food safety liability and gleaner injuries are needed, but note that such supports may best serve those already inclined to donate or participate in these programs.

Convenience and Logistics

Both frequent and infrequent donors emphasized convenience as a key factor in facilitating crop donation and suggested improvements targeting this aspect of existing processes. These findings align with other evidence that increasing convenience serves as an important predictor of voluntary, altruistic behaviors like donating blood (Shaz et al., 2009) and recycling (Domina & Koch, 2016). Many of the reported suggestions for improving donation convenience, including extending donation acceptance hours, leveraging existing networks and events for donation (e.g. farmers markets), providing crop transportation and harvesting, and creating regional food hubs are already underway (Gray et al., 2016; USDA, 2021). Especially for states and programs with limited budgets or supplemental funding, (e.g., those using the federal Farm to Foodbank program mentioned above [USDA, 2021]), our results suggest that prioritizing and expanding such supports could provide substantial impact among both frequent and infrequent donors.

Labor

Donation involves significant labor inputs at the farm level, and both frequent and infrequent donors suggested that finding volunteer labor of sufficient quality was a significant barrier to donation. Though gleaners are commonly part of donation interventions (USDA, 2021), many growers in our sample expressed dissatisfaction with gleaners for various reasons and suggested alternatives or improvements.

To our knowledge, only one other study has assessed how growers perceive gleaners. Harvey et al. (2022) found that gleaners from a nonprofit that provided reliable, trained, and organized volunteers were generally seen as an attractive option to supplement a farm's labor for donation-related harvesting. These findings reinforce our respondents' suggestions that providing higher-quality volunteer labor, or better still, support for professional harvesters, may incentivize some growers in deciding to donate and possibly also improve the quality of donated crops. However, like Soma et al. (2021), we found evidence that when growers use such resources to sell deeply discounted crops to charitable organizations, this can be perceived by other growers as "undercutting," or unfairly lowering crop prices, with potentially negative economic impacts for the farming community. In this case, the grower reported using persons experiencing incarceration for low-cost labor so that they could sell cheaper crops to rescue organizations. We suggest that programs such as this are well intentioned and may have some benefits, but that this approach warrants further consideration regarding negative implications for social justice.

Farming represents one of the nation's most dangerous occupations (National Institutes for Occupational Safety and Health, 2022). Even though gleaners are likely minimally exposed to high-risk farm equipment and tasks, growers' concerns about gleaner safety on farms could be well founded. Some states do have liability protections for farmers who host gleaners, including Maryland (Goeringer, 2021), but they require that farmers disclose dangerous conditions to gleaners, which could be challenging or disputed in the event of an injury or illness. Importantly, neither donation nor civil liability protections can shield growers from bad press in the event of a donation-related foodborne illness or an injury of a volunteer.

Lack of Financial Support

Tax Incentives

Our results build upon existing literature that growers perceive significant limitations to current financial incentives for donation. Tax incentives have been widely promoted to increase crop donation and reduce wasted food, and have been implemented in at least nine U.S. states (Center For Health Law and Policy Innovation, 2022). Maryland's incentive is relatively generous in the U.S.,

providing a tax credit worth 50% of the crop wholesale value (or 75% for certified organic farms), up to US$5,000 (Broad Leib et al., 2016). However, while some studies report tax incentives as major motivators for crop donation (Harvey et al., 2022), our findings align with others (Kinach et al., 2020; Soma et al., 2021) who report their limitations.

Reasons for these limitations aligned with Kinach and colleagues' (2020) findings that, while tax credits theoretically ease donation-related financial burdens, this is not necessarily true in practice for all growers. We also found that while many current donors could benefit from a crop value–based tax incentive, most would not consider it a deciding factor for themselves or others. This study adds to these findings that tax incentives may be limited in convincing nondonors or infrequent donors to donate crops, especially smaller or less profitable farms, heirloom or organic growers, and growers who distrust government programming.

If they are used, we suggest that tax incentives could be tailored to address the needs of existing taxpayers and farm types (Broad Lieb et al., 2022) and that navigation positions (who could provide outreach, education, and assistance with processes, similar to those found in the public insurance industry) within trusted farm and/or community institutions could make incentives more accessible to farmers. We also provide evidence supporting financial incentives for donation-related costs that are easier to compare or track than crop value, such as transportation mileage or labor hours, as implemented in California's crop donation tax incentive (Broad Lieb et al., 2022). Finally, our findings identify the need for financial incentives to be delivered more closely to when costs are incurred, including financial support for growers who do not generate enough profits to pay taxes.

Developing Alternatives to Uncompensated Donation

Our results suggest that FLW reduction efforts cannot rely solely on growers investing their finite resources to donate excesses. There are several important avenues for ensuring that high-quality foods reach people who can use them. In addition to investing in donation processes, other methods could include expanding viable markets for surpluses, upcycling, and emergency food purchasing. Especially given the considerable economic and labor investments required to grow crops, and substantial financial stress experienced by many U.S. growers, monetizing what can be substantial farm-level surpluses could both curb farm-level FLW and support farmers' health and financial longevity.

Limitations

Our sample included only small farms in southern Maryland, and generalizability is limited, as in all qualitative studies. While our qualitative design allowed us to gather in-depth information on the barriers facing potential crop donors, it precludes us from assessing the prevalence of these barriers at the population level. We suggest that future research could explore the frequencies and prevalence among crop growers of the barriers described here. Additionally, the timing of interviews differed between the farms which did and did not donate, and all interviews occurred before the COVID-19 pandemic, which may have changed some donation procedures and perspectives. However, these findings remain relevant and useful for informing donation policies and processes, especially as the need increases for healthy emergency food. Including informants who do and do not currently donate, thus enabling comparison, represents a strength of this study and a valuable contribution to the literature.

Conclusions

This study demonstrates that crop donation motivations, barriers, and facilitators faced by growers are diverse. Frequent donors differed from infrequent donors in their motivations to donate crops, perceptions of donation feasibility, familiarity with the processes, and general acceptance of pro-donation policies, such as tax incentives. Growers' suggestions for increasing crop donation included not only financial support, but also educational interventions, process and logistical improvements, and clarification of existing state and federal donation-related policies. Interventions to enhance donations could focus on not only strengthening current donation systems, relation-

ships, and mechanisms but possibly more importantly, they could reduce considerable burdens related to donations and provide immediate, tangible benefits to donors. Growers' questioning the expectation that farmers give away crops without compensation highlights a need to prioritize interventions that would support both growers' economic viability and reduce production-level FLW.

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Assessing the profitability of scaling up for retail access: Lessons from local salad mix in Southeast Michigan

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Abstract

Changes to the supermarket supply chain in recent decades have "squeezed out" local and small farmers in exchange for more consolidated and global suppliers. As a result, these small-scale farmers have turned to more direct-to-consumer markets, which capture a higher price point but also bear higher marketing costs. Previous research indicates potential saturation and lack of profitability in this market type. Researchers have explored strategies for "scaling up" local farmers into intermediary supply chains, such as grocery retail, and have tested the profitability of hybrid marketing strategies with positive results. However, there are very few studies that utilize production costs to test market feasibility, and even fewer that include retailer willingness-to-pay estimates. To assess strategies from the perspectives of both producers and buyers, this study uses salad mix in Southeast Michigan as a pilot case. Farmer-generated production costs incurred for strategies and production types were estimated in focus groups, and retailer willingness-to-pay estimates were obtained in interviews. The analysis suggests that a combination of more efficient harvest technology and central processing would have the greatest impact on increasing profitability, but the dramatic effect that central processing has on output price makes it the most feasible strategy for small-scale farmers. In addition, the minimal costs of organic certification for small farmers are likely to be justified by the price premium that grocery

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retailers are willing to pay. Hydroponic production may be challenging to break even at a smaller scale but could potentially meet retailers' price preferences at larger scales. Pairing production cost estimates with buyer willingness-to-pay estimates may generate more comprehensive assessments of the relative profitability of potential scaling-up strategies. This method could be applied to other crops, regions, and produce buyers by cooperative extension, nonprofit, or local government personnel working with small farmers on their market development plans.

Keywords
Scaling Up, Salad Mix, Market Feasibility, Production Costs, Central Processing, Organic Certification, Hydroponic, Small Farmers, Local Food Systems

Introduction and Literature Review

Demand for local food is a growing trend among U.S. consumers, who are often willing to pay a premium price for it (Fan et al., 2019; Feldmann & Hamm, 2015). Triggered by the economic and environmental impacts of increasingly global supply chains, consumers seek local food for its better quality, connection to place, local economic development, and democratic values (Goodman et al., 2012). Though *local food* and *local food system* lack official definitions, they generally represent a more direct connection between producers and consumers (Martinez, 2010) and include both direct-to-consumer markets (farm stands, farmers markets, and community supported agriculture [CSA]) and intermediary markets (direct-to-grocery, direct-to-institution, or direct-to-restaurant) (Low & Vogel, 2011).

In response to this growing consumer trend, U.S. supermarket retailers have demonstrated increased interest in procuring local foods for their customers (Bloom & Hinrichs, 2017; Dunning, 2016; Gupta & Jablonski, 2016; Guptill & Wilkins, 2002; Robinson et al., 2017). This interest in sourcing local food reveals a departure from the "supermarket revolution" trends of the 1990s, when advances in wholesaling and processing led to the specialization of supermarket supply chains and procurement systems around the world (Reardon et al., 2009). While examples of both the inclusion and exclusion of local and small farmers are demonstrated in these supply chains (Reardon et al., 2009), increasingly consolidated supply chains in the U.S. put a greater emphasis on global imports rather than regional spot markets, and demand for larger suppliers has increased (Konefal et al., 2007). This has shifted procurement away from regional supply chains in which local farmers could participate and toward more centralized, consolidated, and global procurement systems. Increased consolidation among top producers, distributors, and retailers continues to limit small actor participation in the grocery retail sector (Howard, 2016).

In response, local governments and nongovernmental agencies have pursued a variety of strategies to link small farmers to supermarkets. Examples include the use of "hubs" or "parks" in Asia (Reardon et al., 2012); food hubs in North America (Barham et al., 2012; Blay-Palmer et al., 2013; M. Fischer et al., 2015); contracts in Ghana, India, Madagascar, Mozambique, and Nicaragua (Barrett et al., 2012); and producer cooperatives in South Africa (Chibanda et al., 2009). In the U.S., some researchers have worked directly with supermarkets to increase small and local farm inclusion in the supply chain (Bloom & Hinrichs, 2017; Dunning, 2016; Robinson et al., 2017), thereby both studying and dismantling the barriers to small farm participation in the grocery supply chain.

Ultimately, the squeezing out of small farmers from the mainstream grocery sector has shifted retailing opportunities for small farmers to more direct markets such as farmers markets, farm stands, and CSAs (Guptill & Wilkins, 2002; Schmit et al. 2019). These direct-market retail channels provide higher price points for lower volumes, as well as flexibility in terms of grades and standards for the producer (Low & Vogel, 2011). Direct market sales capture a larger portion of the consumer dollar, which can increase the overall income of a farm operation (Detre et al., 2011). However, the marketing labor costs associated with direct markets are quite high and significantly affect the producers' overall profitability (LeRoux et al., 2010).

Opportunities for conducting retail sales through direct markets have been increasing in the

U.S. nationwide: the number of farmers markets increased 180% between 2006 and 2014 (Low et al., 2015), and in Michigan, the number of farmers markets more than doubled during the same period (Michigan Municipal League, 2014). However, despite the growth in direct retail outlets, direct market sales plateaued between 2007 and 2012 (Low et al., 2015), indicating potential market saturation in this sector. Although the number of marketing opportunities has increased, the potential profitability in these market types remains less understood.

Evidence of low profitability in direct markets presents concerns for the viability of small farmers in the U.S. Farmgate profitability is important for small farmers who are not subsidized by governments to the same extent as they are in Norway, Iceland, Switzerland, Japan, or Korea (Organisation for Economic Co-operation and Development, 2020), nor do buyers commonly participate in resource-providing contracts with small farmers as in the palm oil industry in Ghana (Ruml & Qaim, 2020) or the dairy industry in Poland (Dries & Swinnen, 2004). Overall, profitability in direct market sales is more associated with short-term financial gains, rather than long-term viability (Ahearn et al., 2018), and farms selling in direct markets tend to experience smaller increases in sales over time than other farm types (Low et al., 2015). Park (2015) found that relying more on direct market channels actually had negative impacts on overall farm sales, and that sellers in direct-to-consumer markets tended to be less satisfied with their profitability than those selling to intermediary market channels (Silva et al., 2015).

In response to both potential market saturation and poor profitability in direct-to-consumer markets, researchers and practitioners have explored the idea of scaling up small producers into larger, more mainstream markets (Day-Farnsworth et al., 2009; Friedmann, 2007), including into the retail-distributor infrastructure (Bloom & Hinrichs, 2017; Clark & Inwood, 2016). One technique is to "piggy-back" on mainstream distributor infrastructure, but this strategy has yielded mixed results. Another option is to vertically build new supply chains that focus specifically on small farm viability. Better known as "value chains," supply chain actors work strategically to ensure equitable profit distribution across the supply chain while moving larger volumes of products to larger buyers (Lev & Stevenson, 2011; Stevenson & Pirog, 2008).

A third method for scaling up local suppliers into mainstream or wholesale markets is through horizontal producer collaboration. Cooperatives, as formal collaborative structures, can reduce transaction costs, improve farmgate prices, and increase market access for smallholder farmers (Hoken & Su, 2018; Ito et al., 2012; Verhofstadt & Maertens, 2013). However, the level of collaboration in farmer cooperatives depends on the marginal costs and benefits to the participants, and if a farm is highly diversified, the benefits of working with the group may be low (E. Fischer & Qaim, 2014). Though small, diversified farmers tend to have less incentive to invest in a cooperative (Grashuis & Ye, 2019), even in heterogeneous grower groups, all members tend to benefit from the cooperative's functions (Agbo et al., 2014; Biggeri et al., 2018). One example of cooperative development in scaling-up literature is at Tuskegee University, where researchers and practitioners worked to develop a supply chain between local smallholders and a local supermarket, which then evolved into a producer-managed cooperative (Robinson et al., 2017).

At the farm level, small farm profitability may be increased by developing a hybrid marketing strategy that includes both direct and intermediate markets. Bauman et al. (2018) found that top-performing direct-market producers had lower rates of profitability (measured in returns on assets) than top-performing producers with intermediated sales, thus demonstrating the importance of intermediated sales on profitability. Jablonski et al. (2022) reported similar findings, noting that direct marketing is quite labor-intensive. In a proof-of-concept project intended to evaluate the economic feasibility of shifting from a diversified direct-market cropping system to one tailored for wholesale accounts (fewer crops and more mechanization), Thompson and Gaskin (2018) demonstrated that small growers could feasibly produce for a wholesale market on small acreage and without sacrificing environmental production values. On a more qualitative level, Silva et al. (2015) found that farmers selling in intermediated markets are more satis-

fied with their profitability than those selling into direct-market channels.

However, a significant challenge to both scaling up small producers and hybridizing their market channels is their willingness to participate in intermediary markets. Small farmers report concerns over lost sales due to the lower price point expected in intermediated markets (Thompson & Gaskin, 2018). LeRoux et al. (2010) and Hardesty and Leff (2010) assessed this concern by evaluating the marketing costs in both intermediary and direct markets in case studies. While their findings support the profitability of hybrid marketing plans that include intermediated or wholesale sales, their research omitted production costs from the analysis. It is important to estimate feasibility more precisely in this market sector, as production costs are a substantial component of small farm viability.

Very few studies have analyzed cost-of-production figures in relation to wholesale price points to assess whether this market type is feasible for the small farmer. To address this gap, we paired production cost estimates from producers with willingness-to-pay estimates from wholesale buyers to better assess potential strategies for scaling up. This approach to analyzing market feasibility was successfully explored in a pilot case, as we describe below. Although this case identified promising market opportunities for one type of produce in one region, it could be applied to other crops and regions, as well as other types of buyers.

Southeast Michigan growers produce a wide variety of specialty crops for the local retail grocery market, but locally produced salad mix is relatively absent. Minimal competition for a differentiated local brand of salad mix makes it an interesting produce type on which to perform a small farm feasibility analysis. The salad mix industry differs from other commodities in that the technology required to efficiently harvest, process, package, and ship the product is more specialized than for other crops, and this limits competition in the wholesale sector (Cook, 2011). Additionally, foodborne illness outbreaks in bagged spinach and romaine lettuce have contributed to stricter food safety regulations (particularly Hazard Analysis and Critical Control Point [HACCP] requirements), which dissuades new entrants (Community Involved in Sustaining Agriculture, 2009). That said, in a supply chain case study on direct, intermediate, and mainstream salad mix supply chains, growers received a premium even in the intermediary market for salad mix (King et al., 2010).

Bagged salad mix for foodservice and retail grocery entered the market in the 1970s when TransFRESH worked with Whirlpool Corporation to adapt controlled atmosphere technology for bagged salad transport (Lugg et al., 2017). This technological innovation spurred the emergence of two lettuce shippers in the bagged salad industry: Fresh Express and Dole (Cook, 2011). By 2011, Fresh Express (now owned by Chiquita) and Dole made up 54.4% of the total market share for bagged salad (Howard, 2016). However, if factoring for private label sales, which could account for as much as one quarter of all bagged salad mix sales, the combined Chiquita and Dole market shares are likely much higher (Cook, 2011). While the bagged salad market for foodservice was developing, Earthbound Farm began supplying organic salad mixes to a high-end restaurant, Chez Panisse (Guthman, 2003), and by 2010, Earthbound Farm products were being produced at volumes of nearly 1 million pounds per day (King et al., 2010). The rapid growth of this market sector, due to both technological advancements and market consolidation, has resulted in a limited number of suppliers in the mainstream supply chain. Yet opportunities in a more localized, differentiated supply chain are currently poorly understood.

Applied Research Methods

Researchers commonly gather cost-of-production data using enterprise budgets—a listing of all income and expenses associated with a specific farm or enterprise—as demonstrated in research on hydroponic lettuce (Barbosa et al., 2015), high-tunnel tomatoes and lettuce (Galinato & Miles, 2013), aquaponic tilapia and lettuce (Rakocy et al., 1997), muskoxen (Starr et al., 2017), and blueberries (Fonsah et al., 2011). These studies are helpful in testing feasibility as they identify a common metric for analysis. Individual farmers may exhibit a wide range of cost of production figures, and true cost-of-production figures are often too laborious for farmers to gather themselves. The studies

noted above use data gathered from national survey statistics (Barbosa et al., 2015; Malaiyandi et al., 2010), demonstration trials (Rakocy et al., 1997; Starr et al., 2017), and farmer focus groups (Estes et al., 2003; Galinato & Miles, 2013) to create a single enterprise budget for analysis.

Cost of Production Data

Four types of production methods were analyzed for this feasibility study: field no-till, field mechanical, hoop house, and hydroponic. These were selected because they are the production methods most frequently used by small farmers in Southeast Michigan. Similar to the research performed by Galinato and Miles (2013), farmers worked in focus groups to develop a single enterprise budget for each production method. While the goal was to enlist four small farmers for each focus group, the COVID-19 pandemic added significant strain to farmers' availability. Four producers for field no-till production met in March 2020 before the state issued a stay-at-home order. The research was put on hold, and by December 2020, just three producers for field mechanical production and one producer for hydroponic production were able to participate. The hoop house production budget was extrapolated using the cost-of-production figures from the no-till enterprise budget and factoring in additional variables such as the fixed cost of the hoop house and extended seasonality.

Hydroponic production is quite varied in production styles, presenting a significant challenge to assembling a focus group to develop a single enterprise budget around common costs. Most hydroponic research is based on case studies, with a single production type analyzed. The single producer selected to participate in this research uses Nutrient Film Technique (NFT) to grow salad mix, herbs, and micro-greens in an enclosed warehouse in Detroit, the major urban center of Southeast Michigan.

Focus group participants met for one four-hour session to develop the enterprise budget. A description of all participants' production experiences is shown in Table 1. Their first objective was to determine a reasonable scale of production from which to develop the enterprise budget, which involved determining both the yield and the annual number of successions—i.e., intervals of crop harvests. Because this research is focused on small farm feasibility, the farmers were asked to develop the scale based on a gross cash farm income (GCFI) of US$350,000 or less (the USDA definition of a small farm). The participants chose a scale of production that also considered the necessity for a diverse crop and marketing plan, as these are important risk-management strategies for small farmers. Next, each focus group discussed the basic order of operations for their given type of salad mix production to develop a typical produc-

Table 1. Focus Group Participants

	No-Till				Mechanical			Hydroponic
Participant Characteristics	**Grower A**	**Grower B**	**Grower C**	**Grower D**	**Grower E**	**Grower F**	**Grower G**	**Grower H**
Time farming (yrs.)	8	8	14	8	11	21	17	5
Time owning and/or managing (yrs.)	5	6	9	8	9	9	12	2
Time growing salad mix (yrs.)	7	6	5	8	7	18	12	2
Land in production (acres)	3	1	3	1	6	13	4	1,400' sq.
Primary crops grown	Tomato Peppers Squash Greens	Greens Radish Turnips Carrots	Produce (diverse) Flowers Beef Seeds	Produce (diverse)	Produce (diverse) Meat Flowers	Salad mix Carrots Potatoes Onions Squash	Produce (diverse)	Salad mix Herbs Micro-greens
Volume salad mix produced in 2020 (lbs.)	2,000	3,560	1,898	1,200	700	2,500	N/A	1,088

tion method for the budget. Bed preparation, cultivation techniques, pest management, irrigation, and harvest techniques, for example, were all discussed. Then the group inserted labor costs and material costs for the inputs discussed in each stage and estimated the lifespan of those products that are used over multiple years. The final enterprise budget was organized by variable, labor, and fixed costs, which were depreciated using straight-line depreciation, to determine cost of production for both a single succession as well as annually.

Additional components of the enterprise budget were calculated following the focus group meetings. The cost of seed, sprays, irrigation materials, energy (for hydroponic), and hoop house materials were all calculated using product pricing information from recommended suppliers. Once the base enterprise budget was developed, adjustments were performed to test the scaling-up strategies under investigation: technological innovation in the form of more efficient harvesting equipment, centralized processing in a food hub–type setting, and organic certification.

Market Data

The pertinent market data to evaluate market feasibility include information on weekly volumes, wholesale prices, internal store organization, willingness-to-pay estimates, and previous experience working with local vendors. Using Google search engine results for grocery stores within the seven counties of Southeast Michigan (Jackson, Lenawee, Livingston, Monroe, Oakland, Washtenaw, and Wayne) and the expertise of Michigan State University Product Center Innovation Counselors, a list of 24 independent or cooperative grocery stores was assembled. Independent stores, rather than large grocery chain stores, were chosen for this study because these types of retailers are more agreeable to local food procurement, as they see themselves as embedded in the community (Guptill & Wilkins, 2002).

Each store was contacted up to three times by phone or by email, and of the 24 identified stores, 12 agreed to the interview. The produce buyer, produce manager, or store manager (as a last resort) were principal for conducting the interview, as these individuals have the most contact with pricing and ordering details for the store. The interview questions included basic store specifications, current salad mix purchasing (brand, type, price), a willingness-to-pay scenario, and qualitative questions on local salad mix procurement. Two additional questions on purchasing changes due to the COVID-19 pandemic were also asked. The interview questions are listed in the Appendix. Each interview lasted between 15 and 30 minutes, depending on the level of detail the interviewee was willing to provide.

Research on willingness-to-pay (WTP) typically recommends the use of a detailed description of the good being offered (Portney, 1994). The "local salad mix" product (see Appendix) described for this research was a 5-ounce clamshell of prewashed salad mix, similar to the few existing regional salad mix brands (Revolution Farms and Bright Farms) sold in the local grocery stores. The salad mix was described as conventional (not certified organic) so that a base price could be determined. Interviewees were later asked how much more they would be willing to pay if the product was certified organic, and what characteristics stood out to them as necessary for the product to perform competitively in their store.

The WTP scenario used an open-ended response format rather than providing dichotomous options. Since there are relatively small differences in estimates when comparing open-ended and dichotomous responses (Loomis, 1990), open-ended responses were chosen to reflect the interviewees' specific knowledge of wholesale salad mix pricing. One limitation of this WTP scenario was its failure to address hypothetical bias. Hypothetical bias is common in WTP research, especially when providing answers orally to the researcher, and oral responses tend to overstate their true valuation (Harrison & Rutström, 2008). Follow-up questions with certainty responses have demonstrated effectiveness in removing hypothetical bias (Blumenschein et al., 2008), although certainty responses were not used in this study. While it can be assumed these WTP responses could include some bias, it could also be argued that consumer perceptions differ from wholesale buyer perceptions, and that wholesale buyers, due to the nature of their job, have a more straightforward understanding of

the typical price range for the items they procure regularly. Indeed, the wholesale prices and the WTP prices provided by the produce buyers were similar, suggesting minimal bias.

Organizing the Data

Raw data were arranged on an Excel spreadsheet by grocer (y axis) and question (x axis). We then conducted cross-tabulations to analyze potential patterns or associations between data types, such as between the number of stores and previous experience working with local producers. Qualitative answers, such as those describing the challenges and benefits of working with local producers or the essential qualities in the WTP scenario, were assigned a theme, such as pricing, communication, quality, etc. Comments by theme were tabulated, and some key comments were extracted and shared in the findings.

Two pricing figures required further calculation: the wholesale prices paid for current salad mix brands, and the price-per-pound figures for the WTP scenario. Both pricing figures were calculated by dividing the given case price by the number of units, and then the number of units by package size (ounce). This price per ounce was then multiplied by 16 to produce a price per pound unit of measurement, which could then be compared to the output price per pound developed by the farmer-generated enterprise budgets.

Results

Below we describe the results of the analyses, starting with the break-even analysis for different production types, followed by the market analysis of retailer data.

Break-Even Analysis

A common tool to test production feasibility is the break-even calculation (Dillon, 1993). Rather than simply compare cost of production figures, the break-even calculation uses data on variable costs, fixed costs, profitability margins, and yield to calculate the output price for a given crop to break even. The output price for a break-even budget is calculated via the following equation:

$$P = (VC + FC + p)/Y$$

where price = (variable costs + fixed costs + profits)/yield

Break-even analyses were conducted for no-till, mechanical, and hoop house produced salad mix when hand harvested, harvested mechanically, produced without washing and packing, produced with both the mechanical harvester and without washing and packing, and produced organically (see Table 2). These modifications were chosen based on previous studies of small farm profitability and scaling up. The output price declines most dramatically when the wash-pack step is removed from the production budget.

We conducted a separate break-even analysis for hydroponic production (see Table 2). At this scale, hydroponic production is much less feasible than the field or hoop house production methods. The major costs in this budget included the growing medium, lights, cost to run the cooling fans, and clamshell containers. In terms of labor, cleaning out the NFT gutters was the largest expense.

To test improvements to the feasibility of hydroponic, we performed a break-even analysis for a budget without the packing step, as well as a budget with doubled production. Without the packing step, the output price decreases 13.8%. If the production doubles, using the same number of lights and no additional cooling fans, the break-even output price decreases 19.2%. If both the packing step is removed and production is doubled, the output price decreases 26.8%.

The material and labor costs involved in washing and packing salad mix were significant in all four production enterprises, and the output price decreased 58.6%, 46.2%, 55.7%, and 13.8% for no-till, mechanical, hoop house, and hydroponic production, respectively, when washing and packing were removed from the farmgate budget (see Table 2 and Table 3). However, if a food hub or other centralized processing facility were to perform this function, the final output price to the grocery retailer would need to reflect the additional expenses incurred by the processor.

While a separate enterprise budget for centralized processing and packing is outside the scope of this study, the food hub financial report by the Wallace Center at Winrock International (2019)

provides a benchmark for typical central processing expenses, which can then be applied to this situation. Of the 50 food hubs surveyed, the cost of goods sold (COGS) was 73.5–76.3%. Using a conservative estimate of 50% COGS to account for the additional cost of washing, we calculated output prices that include centralized processing (see Table 3).

Lastly, to provide the closest comparison between the locally produced break-even output price and the wholesale or WTP prices of the grocery retail market, a distribution mark-up of 30% was added. The Michigan State University Product Center, for example, advises their clients to factor a 22–30% mark-up for delivery costs, whether this is task is performed internally or outsourced.

Market Analysis

For the 12 retailers interviewed, two represented cooperatives, with one location each. Ten represented independent grocers, and with one exception (a chain of 16 stores), the number of retail locations was five or fewer.

Grocery Store Purchasing Trends, Order Volumes, and Wholesale Prices

Weekly salad mix orders ranged from two to 500 cases (typical case sizes are six units) with a median weekly order of 45 cases (see Table 4). One grocer mentioned that he prefers case sizes of six rather than eight or twelve for perishable or premium products. With larger case sizes, he is forced to purchase more inventory at once, which increases his costs if they do not sell.

Almost all the grocers noted increased consumer demand for salad greens in the month or two following New Year's Eve (see Table 4). Additionally, two grocers mentioned that salad mix sales decreased in summer. One reasoned that because most of its stores are in a college town, the loss of

Table 2. Break-Even Analysis for Field No-Till, Field Mechanical, and Hoop House Production

	Variable Costs	Fixed Costs	Profit (30% of costs)	Yield (#)	Output Price ($/#)
No-Till					
Hand Harvest	$12,764.04	$683.01	$4,034.11	2,200	$7.95
With Harvest Tech	11,606.57	848.01	3,736.37	2,200	7.36
Without Wash-Pack	4,963.06	609.43	1,671.75	2,200	3.29
Without Wash-Pack + Harvest Tech	3,800.97	774.43	1,373.62	2,200	2.70
Organically	13,268.66	683.01	4,185.50	2,200	8.24
Mechanical					
Hand Harvest	$14,655.17	$2,226.31	$5,064.44	2,200	$9.98
With Harvest Tech	13,260.67	2,391.31	4,695.59	2,200	9.25
Without Wash-Pack	6,934.27	2,152.73	2,726.10	2,200	5.37
Without Wash-Pack + Harvest Tech	5,501.15	2,317.73	2,345.67	2,200	4.62
Organically	15,155.17	2,226.31	5,214.44	2,200	10.27
Hoop House					
Hand Harvest	$15,403.94	$1,567.28	$5,091.37	2,700	$8.17
With Harvest Tech	13,819.28	1,732.28	4,665.47	2,700	7.49
Without Wash-Pack	6,023.74	1,493.71	2,255.23	2,700	3.62
Without Wash-Pack + Harvest Tech	4,439.08	1,658.71	1,829.34	2,700	2.94
Organically	15,903.94	1,567.28	5,241.37	2,700	8.41
Hydroponic					
Hand Harvest	$20,351.85	$695.85	$6314.31	988	$27.69
Without Packing	17,442.22	695.85	5441.42	988	23.87
Double Production	32,712.46	1,309.70	10,206.65	1,976	22.38
Without Packing and Double Production	29,485.71	1,309.70	9,238.62	1,976	20.26

students affects overall sales. The other stated that their customers often shop at the farmers market over the summer, and so produce sales decrease. The increased demand in January and February could be most easily captured by the hydroponics producers, who can reliably grow salad mix in the winter months.

Of the salad mix varieties carried by the grocers, Organic Girl and Revolution Farms are sold at the highest wholesale price per pound (see Table 5), which indicates the upper thresholds for salad mix on the wholesale market. It is important to note that the wholesale price per package never exceeded US$4.00, no matter the package size. One grocer mentioned that customers are willing to spend up to US$5.99 for a salad mix clamshell, but US$6.99 is too much. Two grocers mentioned that their customers would be willing to spend US$4.99 for a 5-oz. package, but not more. Interestingly, this indicates that one way a local vendor can increase the income per pound is to reduce the package size.

Certifications and Insurance

Most of the interviewees stated that their store does not require any type of food safety certification from local vendors (see Table 4). A few mentioned that their distributors handle those types of things, and one mentioned that there were food safety signs posted at the wholesale terminal offices. One store stated that they require a USDA Good Agriculture Practice (GAP) audit or an agriculture license from local vendors. Based on these responses, a food safety certification does not seem to be a common requirement for a local vendor to sell directly to retail grocery stores. However, if using a distributor, the distributor may require a food safety certification.

Similarly, product liability insurance is not required by any of the grocers (see Table 4). One grocer did mention that "it would be a nice thing for them to have," but none stated that this was a requirement. However, distributors may require product liability insurance, so if working with a distributor, this requirement might change.

Ten of the 12 grocers acknowledged that organic certification is an important quality for their customer base. Nine grocers said they would pay a premium of US$0.50–$2.00 per package for organic salad mix. Cost for organic certification varies widely for producers, but a USDA Organic Cost-Share Program can cover up to 75% of

Table 3. Output Prices with Processing and Distribution Costs Factored In

	Farmgate Output Price ($/#)	Output Price with Centralized Processing ($/#)	+ Distribution Mark-up (30%)
No-Till			
Hand Harvest (base)	$7.95	$7.95	$10.33
With Harvest Tech	7.36	7.36	9.57
With Centralized Processing	3.29	6.58	8.55
With Centralized Processing + Harvest Tech	2.70	5.40	7.02
Mechanical			
Hand Harvest (base)	$9.98	$9.98	$12.97
With Harvest Tech	9.25	9.25	12.02
With Centralized Processing	5.37	10.74	13.96
With Centralized Processing + Harvest Tech	4.62	9.24	12.01
Hoop House			
Hand Harvest (base)	$8.17	$8.17	$10.62
With Harvest Tech	7.49	7.49	9.73
With Centralized Processing	3.62	7.24	9.41
With Centralized Processing + Harvest Tech	2.94	5.88	7.64
Hydroponic			
Hand Harvest (base)	$27.69	$27.69	$36.00
Double Production	22.38	22.38	29.10
With Centralized Processing	23.87	47.74	62.06

inspection fees. Compliance requires a three-year transition period, education, an organic system plan, and extensive record-keeping (Coleman, 2012), all of which can be barriers to small farms interested in certification.

Willingness-to-Pay

Interviewees were willing to pay US$1.80–$3.90 per package (US$5.76–$12.48 per pound) for a local salad mix product (see Table 6). Nine retailers were willing to pay an organic premium of US$0.50–$2.00 per package (mean=US$1.25 per package), which if applied to the conventional figures, increases the WTP for an organic 5-oz. package to between US$3.05 and $5.15 per package, and between US$9.76 and $16.48 per pound. The average per-pound WTP figure for conventional and organic salad mix were US$8.84 and US$11.50, respectively. These estimates reflect the previously calculated upper limits of salad mix products currently carried in the grocery retail market (see Table 6).

Only one grocer was willing to pay more for hydroponic-produced salad mix, but of the brands carried in the 12 stores, the hydroponic brand had the highest price per pound. Organic was by far a more distinguishing factor in premium prices, and a few grocers stated that the customer knows and expects organic to carry a premium.

Table 4. Salad Mix Purchasing Specifications at Grocery Stores

#	Type [a]	Salad Mix Brands	Avg. Order/ Week (by case)	Volume Fluctuation	Price Fluctuation	Vendor Food Safety Certification	Vendor Product Liability Insurance
1	C	Bright Farms Earthbound Revolution Farms	26	Dec.-Mar. high	Rise during COVID-19	If local vendor: GAP audit or agriculture license	None
2	I	Earthbound Organic Girl	35–55	Summertime low	Very stable	None	None
3	I	Earthbound Farms Fresh Express Revolution Farms	90 [b]	Jan.–Feb. high June–Aug. low	Very stable	None	None
4	I	Dole Fresh Express	40–50	First half of month high	Increase in winter	None	None
5	I	Dole Organic Girl Revolution Farms	500	Jan. high	Very stable [c]	None	None
6	I	Dole Earthbound Farms Fresh Express Taylor Farms	30–40	Jan.–Feb. high	Very stable	None	None
7	I	Dole Earthbound Farms Fresh Express Organic Girl Taylor Farms	210	Jan.–Feb. high	Very stable [c]	None	None
8	I	Earthbound Farms Fresh Express Organic Girl	130–200	Jan.–Feb. high Apr.–May high	Very stable [c]	None	None
9	I	Organic Girl		May–Aug. high	Very stable	None	None
10	I	Earthbound Fresh Express	20–40	Jan.–Feb. high		Unsure	Unsure
11	I	Fresh Express	60–120	When on sale	Very stable	Yes—posted at terminal offices	None
12	C	Revolution Farms	2–3	Unsure	Unsure	None	None

[a] C=cooperative, I=independent

[b] Order volume for just one of the 16 stores in the company

[c] Under contract

Discussion and Conclusions

Local food is a growing trend in the U.S., and while retail grocers are increasingly interested in sourcing local foods for their stores, small farmers face significant challenges in serving this market type. Increased supply-chain specialization and consolidation have made it difficult for small farmers to compete on price or efficiencies accomplished by mainstream supply chains. As a result, small farmers rely on direct-to-consumer markets such as farmers markets, farm stands, or CSA programs, but these require significant marketing costs and are potentially becoming saturated. In response, researchers and practitioners have explored the idea of scaling up small farmers into intermediated markets, such as restaurants, retail grocers, and institutions. Such strategies have included "piggy-backing" on traditional supply-chain infrastructure, building new value chains, and collaborating horizontally among producers. Data show that farmers with a hybrid marketing platform that includes intermediary sales are more likely to be profitable than those selling in direct

Table 5. Salad Mix Wholesale Pricing (Estimate)

	Package size (oz.)	Wholesale price/pkg.	Price per oz.	Price per lb.
Bright Farms	6	$2.67	$0.45	$7.12
Dole	10	2.25	0.23	3.60
Earthbound Organic	5	2.38	0.48	7.62
Earthbound Organic	6	2.18	0.36	5.81
Earthbound Organic	10	3.33	0.33	5.33
Earthbound Organic	16	4.00	0.25	4.00
Fresh Express	5.5	2.24	0.41	6.50
Fresh Express	6	2.11	0.35	5.63
Fresh Express	9	2.44	0.27	4.34
Organic Girl	5	2.73	0.55	8.74
Organic Girl	6	3.50	0.58	9.33
Revolution Farms	4	2.82	0.70	11.26
Taylor Farms	6	2.44	0.27	5.63

Table 6. Willingness-to-Pay (WTP) Estimates by Weight and Production Types

#	WTP per oz. ($)	WTP per 5 oz. package ($)	WTP per lbs. ($)	Is organic important for customers?	WTP premium for:	WTP with avg. organic premium per pkg. ($)	WTP with organic premium per lb. ($)
1	$0.60	$3.00	$9.60	Yes	OG, RG	$4.25	$13.60
2	0.56	2.80	8.96	Yes	OG	4.05	12.96
3	--	--	--	No	OG	--	--
4	0.40	2.00	6.40	No	None	2.00 [a]	6.40 [a]
5	0.36	1.80	5.76	Yes	OG	3.05	9.76
6	0.62	3.10	9.92	Yes	OG	4.35	13.92
7				Yes	OG		
8	0.50	2.50	8.00	Yes	OG	3.75	12.00
9	0.78	3.90	12.48	Yes	OG, NT	5.15	16.48
10	--	--	--	Yes	OG, HP, HH, NT, OT	--	--
11	0.45	2.25	7.20	Yes	None	2.25 [a]	7.20 [a]
12	0.70	3.50	11.20	Yes	None	3.50 [a]	11.20 [a]
Avg.	**$0.55**	**$2.76**	**$8.84**			**$3.59**	**$11.50**

OG=organic certified; HP=hydroponic grown; HH=hoop house grown; NT=no-till grown; OT=grown outside; RG=regenerative grown
None=organic premium not applied
-- =declined to answer

markets only. However, many farmers' current lack of willingness to participate in intermediary markets presents a significant challenge to scaling up into markets like retail grocery. Research to date has not demonstrated the feasibility of intermediary sales for small farmers using cost of production figures, and very few studies also include buyer willingness-to-pay estimates.

Using salad mix in Southeast Michigan as a pilot case, this research used production figures from small farms to perform a feasibility study on salad mix sales to local independent and cooperative retail grocers. Four types of production enterprise budgets—field mechanical, field no-till, hoop house, and hydroponic—were developed to then incorporate strategies previously identified in the literature for scaling up small farm enterprises. These strategies included technology innovation, central packing and distribution, and organic certification.

The data show that of the four production methods studied at the base level, (hand-harvested) no-till had the lowest cost of production, due in part to the low labor costs for hand weeding. Small-scale hydroponic production, on the other hand, had the highest cost of production, and was found to be largely infeasible at this scale of production. When the enterprise budgets were adjusted by scaling-up strategies, centralized packing had the greatest impact on lowering the break-even output price for the producer. Centralized processing and packing was conservatively estimated to make up 50% of the cost of goods sold, in contrast to the 73% average reported by U.S. food hubs for their operations (Wallace Center at Winrock International, 2019). When added to the farmer output price, both no-till and hoop house production with central processing remained within the price range retailers were willing to pay. While not within the WTP range, mechanical production, adjusted for central processing, stayed within the current range of wholesale prices. This study stops short of developing an enterprise budget for central processing to test the true feasibility of this option, but this is recommended for future research.

The findings suggest that advancements in harvest technology reduce the output price the most when the technology is used more often, as in the hoop house production method, which has a greater number of annual successions. In addition, the impact of organic certification on output price is small enough compared to the price premium that this differentiation strategy is recommended for mechanical, no-till, and hoop house production. The cost barriers for organic hydroponic production, and the high price point for conventional hydroponic salad mix in the current market, make organic hydroponic a less recommended option at smaller scales, however.

The results of studies such as these are intended to supplement resource providers, such as cooperative extension, nonprofit, and local government personnel, with data to help inform small farmers' market development decisions. This approach could also be applied, with slight modifications, to numerous other crops and geographic regions, to develop more comprehensive assessments of potential market opportunities. It could be extended to other types of buyers as well, such as food hubs, hospitals, schools, and restaurants.

Since this approach focuses mostly on price feasibility, it does not address other qualities that may be essential for success in this market sector. Additional research is recommended to examine the characteristics of mainstream salad mix players—or other large produce firms—and how their scale, marketing, and production systems contribute to success in the retail grocery market. A deeper understanding of the needs of produce buyers or purveyors could also help bolster a more well-rounded feasibility study on this market sector. Another consideration to analyze is the ongoing consolidation of the retail grocery sector. As more independent grocers are acquired or squeezed out of the market by larger supermarkets, research that considers the feasibility of local products into larger supermarket retail chains is recommended.

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Appendix. Grocer Interview Questions

1. Store Specifications:
    a. How many store locations are in the company?
    b. What is the square footage of the store(s)?
    c. Which produce distributors do you work with?
    d. How is salad mix purveyed?
    e. What is your ownership model (independent retailer, cooperative, franchise)?

2. Current Salad Mix Supply
    a. What brands of salad mix do you carry and in what package sizes?
    b. What is the case size for each brand and package size?
    c. What price do you pay for a case of each type of salad mix?
        i. Does this price fluctuate throughout the year? If so, please describe.
    d. How many cases per week is an average order?
        i. Does your order volume fluctuate throughout the year? If so, please describe.
    e. Is organic-certified an important quality for you and/or your customers?
    f. Do you require any food safety certification from the vendor?
    g. Do you require product liability insurance from the vendor?
    h. What is the difference in both conventional v. organic in sale and price?

3. Contingent Valuation (Willingness-to-Pay) Exercise

    Description of Salad Mix:

    The good being offered is a pre-packaged salad mix in a 5 oz. plastic clamshell. The product is not certified organic. Upon inspection, you can see that the salad mix is clean, ready-to-eat, with attractive labeling. The phrase: "grown by local farmers" is displayed prominently on the front. The product holds food safety certifications from the USDA and is processed in an inspected facility.

    The packaged salad mix would be distributed by a regional distributor. The distributor is responsible for managing the cold-chain, providing invoices, and general customer service. The clamshells would arrive in a 6-unit case.

    An order could be filled in 1-7 days. Standing orders preferred.

4. Contingent Valuation Questions
    a. Based on the description above, how much would you be willing to pay for a case of this salad mix?
    b. Based on the description above, what details stand out to you that you deem necessary or are required for you to consider purchasing this item?
    c. Any other thoughts on the product description provided?
    d. Would you pay more for this local food salad mix if it was labeled as:
        i. Certified Organic
        ii. "Hydroponically grown"
        iii. "Hoop-house grown"
        iv. Produced using "organic no-till practices"
        v. Grown outside

5. Qualitative Questions
    a. Have you ever purchased produce from a local vendor for your store?
    b. Please describe that process. What were the challenges, what were the benefits?
    c. What is your perception on local markets as a risk-aversion strategy in times of market disruption?
    d. How has your purchasing changed since the pandemic?

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Raising awareness and advocating change: The work of Nova Scotia food security NGOs

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Abstract

Although Nova Scotia nongovernmental organizations (NGOs) have been working on local food security for many years, there is limited research that has analyzed their activities and impacts. Employing the Food and Agriculture Organization of the United Nations' (FAO) four dimensions of food security—food availability, food access, food utilization, and food stability—to guide data collection and analysis, we examined the work of nine Nova Scotia NGOs through document analysis, media analysis, and interviews with NGO representatives. We categorized the findings according to two broad themes of raising community awareness and conducting research/policy advocacy, and two more focused themes of partnerships and funding. We then discussed the rich array of food security "orientations" throughout the province, spanning community food security, household food insecurity, food justice, food sovereignty, and policy work. We found that the FAO's four criteria, based as they are on larger scales (e.g., the national level), could not easily capture the myriad community-level food security work in Nova Scotia. We did note, however, that at the subnational

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level, indicators point to the continued dominance of the agri-food system in the province. We suggest that the relations forged by the food security NGOs with local universities and civic organizations could be reinvigorated in the post-COVID era with longer-term, joined-up sustainable food policy approaches coupled with institutional mapping of key actors.

Keywords
Food and Agriculture Organization, FAO, Food Security, Nova Scotia, Media Analysis, University Partnerships, Nongovernmental Organizations, NGOs, Community-based Organizations, CBOs

Introduction

The past decade has seen the formation of nongovernmental organizations (NGOs) intended to strengthen food security in Nova Scotia. On the surface, the existence of food security NGOs in Nova Scotia would appear incongruous with the province's food profile and relatively small family farm profile. Located on Canada's Atlantic seaboard, the province of Nova Scotia, numbering about one million people, has an agricultural profile conducive to a more localized agriculture that includes the dominant supply-managed dairy sector, commercial vegetables, and small fruits (especially apple orchards) among other crops, as well as downstream value-added industries such as cottage wine and craft beer enterprises (Andrée et al., 2016). Anchoring small-town and rural Nova Scotia, and a potential mass market for local produce, is the provincial capital of Halifax, a burgeoning metropolis with about half the province's population and a hub for innovation, industrial estates, Maritime-based hospitals, world-class universities, provincial and federal government offices, as well as home base to the Royal Canadian Navy Atlantic fleet.

If, however, this static picture of a relatively prosperous region of a G7 country is peeled away, a more sobering reality emerges. Local food systems are under stress along all points of the production-distribution-consumption continuum (McLeod-Kilmurray & Chalifour, 2019). Recent census numbers reveal ongoing and accelerating declines. During 2011–2016 there was a 10.9% drop in census farms and a 10.1% drop in farm area (Statistics Canada, 2016). The shift from local, geographically dispersed grocery stores in Nova Scotia (e.g., co-op groceries) to larger, more concentrated big-box stores, has inhibited both the supply of and access to local, nutritious food, particularly for those living in rural or isolated regions (Activating Change Together for Community Food Security [ACT for CFS], 2015). Furthermore, the bulk of the province's food is imported, with only an estimated 8.4% of Nova Scotia's food dollars in recent years going back to its farmers (Nova Scotia Federation of Agriculture, 2020). At the same time, many fishers and farmers face high production costs and stagnant prices, even while many (urban) households cope with incomes inadequate to purchase a healthy food diet (ACT for CFS, 2015; Andrée et al., 2017).

Inadequate income assistance and minimum-wage jobs have contributed to Nova Scotia having among the highest rates of household food insecurity of Canada's ten provinces, with approximately one in six Nova Scotian households affected (ACT for CFS, 2015; Blair et al., 2015; Food Insecurity Policy Research, 2021; Loopstra, 2018; Newell et al., 2014; Williams et al., 2012). In 2017–2018, approximately 60% of Canadian households whose primary income source was social assistance reported experiencing food insecurity, including Indigenous communities, African Canadians, newcomers, other minorities, and the working poor (Harper et al., 2022). In response, emergency food security programs have been established to combat immediate hunger in poorer neighborhoods, such as through food banks and soup kitchens (Coleman-Jensen et al., 2014; Slater, 2007; Vitiello et al., 2015). Studies of emergency food security programs span all of Canada, from the Northwest Territories (Spring et al., 2020) and British Columbia (MacNair, 2004) to the marginalized neighborhoods of Scarborough in east Toronto (Choonsingh et al., 2010) and eastward to Quebec and Atlantic Canada (Tarasuk et al., 2014).

While emergency food security is a critical sphere of food security work, we sought to understand longer-term strategies to strengthen Nova Scotia's food security profile. Crucial here were NGOs, which have been important actors in

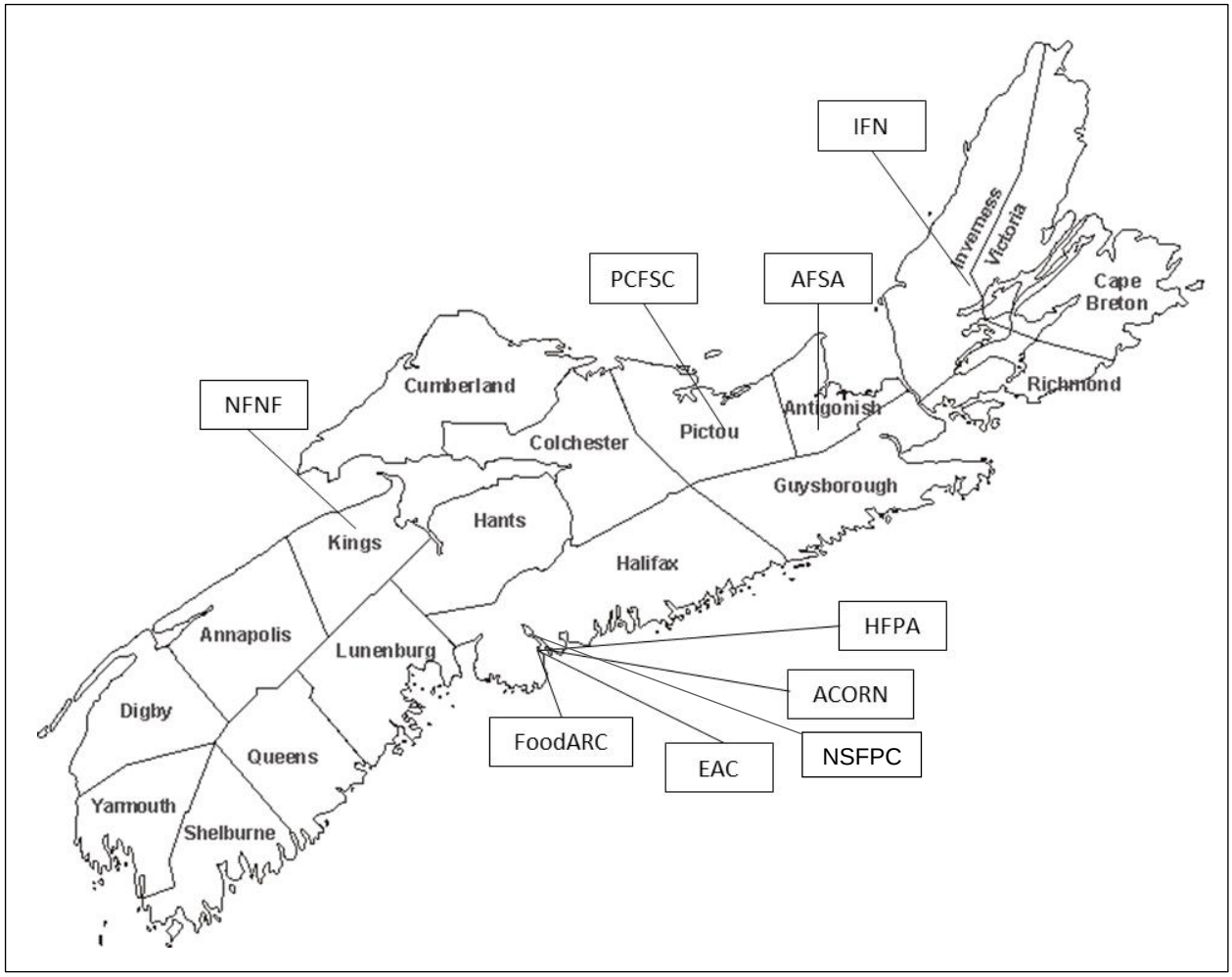
food security in Canada (Chinnakonda & Telford, 2007). Most of this work is relatively new, as are systematic studies on their activities. Fairholm's (1999) survey of NGOs working on urban agriculture and food security noted the paucity of comprehensive data about the scope of their efforts or the long-term effectiveness of their projects. A more recent study has sought to weigh "alternative" (e.g., localism, consumer choice, entrepreneurialism, and self-help) and "oppositional" food system transformation efforts in four Canadian provinces, including Nova Scotia (McInnes et al., 2017). A Nova Scotia case study analyzed the bottlenecks to successful local food system work (Andrée et al., 2016). While these studies discuss to some extent how food security organizations work in the Canadian context, gaps remain in understanding what exactly has been happening with food security work in Nova Scotia.

For this study's research design, we applied the FAO definition of food security in order to have a metric by which to get a bird's-eye view of the activities, orientations, and perspectives of myriad organizations working over many years in Nova Scotia's food security space. (For an institutional history of FAO, see Gustafson & Markie, 2009.) The FAO definition, based on the 1996 World Food Summit, is arguably the most recognized and accepted (FAO, 2008; Lambek, 2019). The FAO defines food security as "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preference for an active and healthy lifestyle" (FAO, 2008; Napoli, 2010/2011, p. 7). The FAO has identified four dimensions to food security: (1) food availability, when enough food is available whether through domestic production or imports from outside countries; (2) food access, which is met when people have sufficient resources to access the food they need in their community; (3) food utilization through safe water, adequate diet, sanitation, and health care; and (4) food stability, where people have access to adequate food regardless of crises (such as environmental or economic disruptions) or cyclical events (such as changing seasons) over the longer term (FAO, 2008). The four dimensions guided the development of the interview questions, of codes for document and media analysis, and some preliminary analysis. However, as we detail in the Discussion, although the findings revealed multiple types of food security work undertaken by the case study NGOs in the province, the four FAO dimensions had only limited applicability to NGO orientation and action.

Methods

The main work, completed between 2018 and 2019, undertook document and media analyses as well as key informant interviews with NGO representatives. Nine organizations (see Figure 1) with a focus on strengthening local food security or access to food were identified through internet searches as well as through one of the author's (GC) knowledge of local organizations. Although it is impossible to be certain that all relevant organizations were found, it seems unlikely that any were omitted, as no others were mentioned in the more than 250 news articles reviewed for the research or in the interviews with NGO representatives. The identified organizations represented different areas of the province as well as different scales of activity, from policy-driven entities at the provincial level (one organization), to Halifax-headquartered entities working across Nova Scotia (four organizations), to county-level groups working locally on food related issues (four organizations). Initially, we had intended that this research be conducted solely through analysis of documents found on each organization's website with the goal of describing and analyzing the types of activities the organization had undertaken (GC, DK). We assessed the NGO documents and websites according to drivers that involved visioning, concerns, and actions in relation to the FAO definition and to community food security indicators such as access to local food and community self-reliance. However, we found the organizations' websites were often out of date and contained limited information about their activities, thus making it very difficult to determine their level of activity and achievements. As a result, we felt that a document analysis alone was insufficient to get a picture of the work of Nova Scotia food security NGOs. Therefore, we extended into a second phase of the research so as to expand the quantity and quality of

Figure 1. Locations of the Nongovernmental Organizations (NGOs) in Nova Scotia



information for each organization.

For phase two, one of the authors (JR) undertook a media analysis, examining Canadian newspapers in order to better describe and assess activities undertaken by these nine organizations. Each organization was searched by entering its name as a single search term into Eureka, a searchable database supporting academic research that consists primarily of newspapers.[1] The search was limited to Canadian media sources published in English between 2008 and 2018. Articles were retained if they focused on activities related to local food security work in Nova Scotia. Two authors (JR, SD) reviewed a total of 256 relevant articles to extract and describe the activities engaged in by each organization. Based on the articles, eight types of activities were identified and each was assigned its own category (see Table 1). We then reread and summarized the activities of each organization and coded the summarized activities using the eight categories, with some activities falling into more than one category. Although we gleaned much information through media analysis, there were still gaps in this information, given that some activities undertaken may not have made it into media accounts due to not being deemed newsworthy, or, if in media, details may have been omitted. As a consequence of this potential gap, we added a third research phase.

Prior to beginning phase three, we received ethics approval from the Dalhousie University

[1] http://eureka.cc/en/academic-library

Table 1. Types of Activities of NGOs Engaged in Local Food Systems Work in Nova Scotia

Organization *	Types of Activities: Voiced an opinion/ Raised awareness	Published a report	Conducted research	Organized public events	Involved with community projects	Associated with other organizations	Affected policy change	Research/opinions referenced by others
Antigonish Food Security Association [AFSA] (7) Formed in 2009, a network of individuals, groups, and organizations engaging with the Antigonish community to focus on local food supply, institutional purchasing, food safety requirements, farm labor supply, and establishing a food hub in downtown Antigonish. https://www.facebook.com/AntigonishFSC/	✓	✓	✓	✓		✓	✓	
Association of Community Organizations for Reform Now [ACORN Canada] (21) Formed in 2004 (first Nova Scotia chapter, 2011), a national organization that works across Canada to help low- to moderate-income communities address their financial needs. The ACORN Nova Scotia office is in Halifax. https://acorncanada.org/locations/nova-scotia-acorn/	✓	✓	✓	✓		✓		
Ecology Action Centre [EAC] (53) Formed in 1971, an environmental NGO based in Halifax that works to effect change on critical environmental issues through building awareness, community development, and policy advocacy. The EAC stands out from the other organizations in that food systems work is just one of its several foci. The EAC is also bigger, older, and more complex than other Nova Scotia NGOs, with deep-rooted connections in Nova Scotia government bodies and communities. https://ecologyaction.ca/	✓	✓	✓	✓	✓	✓	✓	✓
Food Action Research Centre [FoodARC] (26) Formed in 2012 and based at Mount Saint Vincent University, Halifax, conducts participatory community action-research to build food security in Nova Scotia through addressing both community and household food insecurity. https://foodarc.ca/	✓	✓	✓	✓		✓		✓
Halifax Food Policy Alliance [HFPA] (8) Formed in 2013, a partnership of individuals and organizations sharing a vision of a Halifax where no one is hungry and that is sustained by local producers. https://halifaxfoodpolicy.wordpress.com/		✓	✓	✓		✓		✓
Island Food Network [IFN] (17) Formed in 2016, works to connect stakeholders of the Cape Breton food supply community across sectors and in training, outreach, and some lobbying at the municipal level. https://islandfoodnetwork.ca/	✓	✓	✓	✓	✓	✓		

continued

Table, continued

Organization	Types of Activities							
	Voiced an opinion/ Raised awareness	Published a report	Conducted research	Organized public events	Involved with community projects	Associated with other organizations	Affected policy change	Research/opinions referenced by others
No Farms No Food [NFNF] (101) Formed in 2010, a county-level volunteer-based organization in the Municipality of the County of Kings aimed at protecting farmland from non-agricultural development through lobbying and community mobilization. https://www.facebook.com/people/NF2-No-Farms-No-Food/100066584233103/	✓			✓	✓	✓	✓	
Nova Scotia Food Policy Council [NSFPC] (17) Formed in 2010 as a pan-Nova Scotia entity to shift Nova Scotia provincial food expenditures to healthier, locally grown food. The organization is no longer active. https://nsfoodpolicy.wordpress.com/				✓				
Pictou County Food Security Coalition [PCFSC] (6) Formed in 2006, works to increase food security in Pictou County through community partnerships, research, and capacity building. https://pictoucountyfoodsecurity-blog.tumblr.com/			✓	✓		✓		

* Numbers in parentheses denote the number of newspaper articles found related to local food security work.

Research Ethics Board. We then contacted eight of the nine organizations for interview requests and followed up twice with organizations that did not respond to the initial request. The Association of Community Organizations for Reform Now (ACORN) Canada was not included because the document and media analyses indicated that ACORN Canada did not participate in activities directly related to local food security work, but rather advocated for higher minimum wages and family income. Representatives from five organizations—No Farms No Food (NFNF), the Ecology Action Centre (EAC), the Halifax Food Policy Alliance (HFPA), the Island Food Network (IFN), and the Antigonish Food Security Association (AFSA)—agreed to be interviewed within the research time frame. No Farms No Food requested two separate interviews, and we conducted one interview with a person who represented both the Ecology Action Centre and the Halifax Food Policy Alliance. One author (JR) conducted five phone interviews between February 26 and April 26, 2019. These semi-structured interviews lasted 30–60 minutes and were audio-recorded. Interview topics were guided by elements that composed the FAO definition of food security and included the following categories: activities undertaken, partnerships, perceived impacts, and barriers to success (see the interview guide in the Appendix). The recorded interviews were transcribed by one of the authors (JR), and to help ensure trustworthiness (Lincoln & Guba, 1985), the transcripts were returned to interviewees to be reviewed for accuracy and to ensure that the interviewees were comfortable with any information that might be published.

Thematic analysis of the interviews began with categorizing the activities for each organization using the same eight categories as employed for the media analysis. We (GC, JR) then read the interview transcripts multiple times to determine commonalities across the organizations' activities. Two main themes (raising community awareness, research/policy advocacy) and two minor themes (partnerships, funding) emerged that characterized

the work of the NGOs. We next reviewed and summarized all information from the document analysis, media analysis, and interviews according to each of the four identified themes in order to provide a comprehensive descriptive analysis of the activities performed by the NGOs.

Findings

We organized our findings based on the two broad emergent themes of raising community awareness and conducting research/policy advocacy, which captured the majority of activities undertaken by the NGOs, and, more importantly, portrayed how these organizations represented themselves via their websites, reports, and interviews as well as newspaper articles. However, before discussing these two major themes, we first want to note two important elements that seem to have impacted all organizations: working together in partnerships and the challenges of funding.

"Partnerships" was a theme that touched on all organizations. FoodARC and the Ecology Action Centre, in particular, were found to have many partnerships, including the other smaller county-level organizations. One of the most important aspects of the Ecology Action Centre's work involved facilitating common activities with the Island Food Network and the Halifax Food Policy Alliance, including the development of food charters (EAC/HFPA Interview). The Halifax Food Policy Alliance's partner organizations included the Ecology Action Centre, FoodARC, Feed Nova Scotia, which coordinates food banks in the province (Feed NS, n.d.), Capital Health, Community Society to End Poverty, United Way, Halifax Public Libraries, Dartmouth Family Centre, the Halifax Regional Municipality (HRM), the Nova Scotia Health Authority, and Dalhousie University's Schulich School of Law (Blair et al., 2015; Halifax Food Policy Alliance, 2023). Among the county-level organizations' extensive partnerships were the Island Food Network's work with Cape Breton University, Cape Breton Public Health, the Nova Scotia Federation of Agriculture (NSFA), the Glace Bay Food Bank, and the Cape Breton Food Hub, a multistakeholder cooperative. The Antigonish Food Security Association partnered with the Antigonish Poverty Reduction Coalition, VOICES Antigonish, and the Lochaber Growers cooperative on community gardens, locally, as well as with Food Secure Canada, provincially. The Pictou County Food Security Coalition partnered with the Municipality of the County of Pictou to connect local farmers to consumers through an online database, as well as with FoodARC and the Pictou Regional Development Commission.

"Funding," mentioned often in interviews, was a serious barrier to the furtherance of these organizations' mandates, especially for the NGOs based in rural counties. In the case of No Farms No Food, financial issues hampered the agricultural farmland campaign, particularly for funding for gas money and printing campaign items (NFNF Interviews #1 and #2). The Antigonish Food Security Association's food hub was not operationalized due to lack of funding and other competing priorities (AFSA Interview). No Farms No Food and the Antigonish Food Security Association interviewees both highlighted the reality of volunteer burnout as well. Intraprovincially, some Island Food Network members reportedly perceived a provincial government bias in the allocation of funds toward Halifax over Cape Breton, with the view expressed that getting funding was "next to impossible" (IFN Interview). Studies elsewhere have also described the disruption caused by funding irregularities, together with donor mandates tied to concrete projects, short-term contracts, private donations, and even political agendas, all of which take up administrative time that is not spent advancing local food security (Fairholm, 1999; Wakefield et al., 2012).

Activities Related to Raising Community Awareness

Rising food prices, food scares, food shortages, food safety, environmental degradation, and other concerns all hint that there may be issues connected to feeding North Americans through a globalized food system. Activities associated with voicing an opinion, organizing public events, and involvement with community projects primarily entailed trying to raise citizen awareness about local food security and connect how food concerns are related to the globalized food system. Simply voicing an opinion related to food security and local-

ized food systems was the easiest form of raising awareness, but reaching a wide audience often proved challenging. This challenge could be seen, for example, by the relatively small number of times over the course of a decade that each organization was even mentioned in Canadian newspapers (Table 1). One notable exception was the No Farms No Food campaign to block the rezoning of prime agricultural farmland in the Municipality of the County of Kings, in the Annapolis Valley, which involved sustained community mobilization in the province.

The Ecology Action Centre and Island Food Network in Cape Breton were the only other NGOs able to appear in, on the average, more than five articles per year. Taken collectively, however, a different story emerges with the nine NGOs able to achieve a newspaper appearance about twice a month, mainly in Nova Scotia newspapers. These articles demonstrated each organization promoting similar messages involving the importance of different aspects of a local, secure food system, messages that undoubtedly would have reached thousands of Nova Scotians.

Many of the NGOs co-hosted events in their communities. Prominently, the Ecology Action Centre networked with the Cumberland Food Action Network, the Halifax Food Policy Alliance, and the now-defunct Nova Scotia Food Security Network (McInnis et al., 2017), to host the 2nd annual Nova Scotia Food Security event in Debert in 2008 (Cobb et al., 2017; Macintyre, 2008). The Ecology Action Centre also partnered with the Halifax Regional Municipality, the Nova Scotia Health Authority, and Partners for Care to open the Mobile Food Market in May 2016 to bring healthy food to food deserts such as Spryfield, Fairview, and Dartmouth, where many African Canadian communities reside, as well as to seniors, single-parent families, and new Canadians (*The Chronicle Herald*, 2016; *Truro Daily News*, 2017). FoodARC and the Halifax Food Policy Alliance also did outreach work on urban agriculture, food deserts, and community and school gardens (Carlsson et al., 2016). Many thousands of others, including Acadians, Indigenous communities, immigrant service association, and family resource centers, were also reached through garden literacy training, community gardens, school gardens, food preservation workshops, and policy training (Fitzpatrick, 2009; Noseworthy et al., 2011; Wagstaff, 2018).

At the county level, the Antigonish Food Security Association initiated a community kitchen in the Antigonish farmers market and a food box program for low-income households, as well as organizing public events like "Seedy Saturday" (for seed exchange and gardening advice). The Pictou County Food Security Coalition CSA (community supported agriculture) local-food box program and a community food-buying club aimed to connect low-income households with local farmers (Cobb et al., 2017). The Cape Breton-based Island Food Network engaged the local community with its "Getting Our Hands Dirty" and "Upskilling" events to strengthen cooking skills in the community, and created an "asset map" featuring, among others, processors, institutions, rentable kitchens, community gardens, and farmers markets (*Cape Breton Post*, 2017; IFN Interview). The Island Food Network–sponsored events allowed farmers to step away from busy schedules whereas routinely they would just "cross paths at the market, but never have a chance to connect" (*Cape Breton Post*, 2018, p. A6). The Island Food Network also worked on compiling the Strategic Action Plan for Cape Breton that involved local municipal councils, Mi'kmaq bands, and Cape Breton University (Jala, 2019; *The Reporter*, 2019; Sullivan, 2018).

All the interviewees were able to speak as to how their organizations' activities translated to raising public awareness. Following the completion of Ecology Action Centre–led projects in food and garden literacy, the majority of participants said their nutritional and gardening skills had increased (Cobb et al., 2017). The Ecology Action Centre also published reports and hosted events and workshops, and "understand[s] how to translate issues that they're experiencing on the ground into policy change" (EAC/HFPA Interview). Co-author of the Halifax Food Policy Alliance's *Food Counts*, Valerie Blair, stated that "people are coming together, starting to look at food in a different way … and this report is one of the contributions to that so people can better understand the system" (Spurr, 2015, p. A3). Similarly, the Antigonish

Food Security Association reported greater use of gardens at schools and nursing homes, and rallied the town council behind the local farmers market (AFSA Interview). For the Island Food Network, awareness raising was "really important in helping people understand just the massive scope that food has when it comes to community development, community [and individual] health and wellbeing" (IFN Interview).

The No Food No Farm 2010 campaign to stop the rezoning of 380 acres of prime farmland in Greenwich, Nova Scotia, in the Municipality of the County of Kings likely "made people aware of the significance of farmland and the need to protect it" (NFNF Interview #1). Another No Farm No Food interviewee stated that her sister in Alaska heard her speak about the campaign on the Canadian Broadcasting Corporation (CBC) news, indicating wide public airing of the farmland protection issue across North America. The interviewee also noted the greater appreciation locally that Municipality of the County of Kings councilors have received about farmland protection; some Greenwich farmers even planned to transition their farms into agro-tourism enterprises (NFNF Interview #2). The publication of more than 100 news stories about the No Farm No Foods campaign indicated a significant penetration into the public consciousness.

Activities Related to Conducting Research and Policy Advocacy

Research output shone a critical light on food security work in Nova Scotia, as FoodARC, the Ecology Action Centre, the Halifax Food Policy Alliance, and the Antigonish Food Security Association's studies have certain research commonalities. For example, these organizations have called for increased research and continuing partnerships. However, these formalized reports (see references) often did not give specific recommendations or report on research impacts. It is not clear whether there were capacity issues around lack of follow-up, insufficient funding, member burn-out, or lack of frameworks for determining measures of progress. Only the report *Our Food Project* by the Ecology Action Centre discussed actions they had employed to impact food insecurity (Cobb et al., 2017). Another important report, FoodARC's *Activating Change Together for Community Food Security* (ACT for CFS, 2015), detailed the challenges facing local food security, including food deserts, living wages, scale-friendly regulations, and weak linkages among the fisheries, agriculture, and public health sectors. Media stories also showcased FoodARC's ACT for CFS (2015) report (e.g., Deschene, 2014a, 2014b). The Halifax Food Policy Alliance's *Food Counts* report echoed many of the challenges to local food security indicated in the ACT for CFS report (2015) and, more positively, noted the growing footprint of farmers markets, greenhouses, and community gardens in the Halifax Regional Municipality (HRM) (Blair et al., 2015). *Food Counts* also urged the HRM to commit to measures to protect farmland and to promote urban agriculture and adopt a municipal food charter (HFPA, 2014). A report by the Ecology Action Centre and the Nova Scotia Federation of Agriculture charted the vast global distances food travels before reaching consumers' plates and was frequently cited in food movement circles and media in the province (Benjamin, 2010; Scott & MacLeod, 2010). The Antigonish Food Security Association report *Community Food Assessment for Northeastern Nova Scotia* profiled the area's food production base, the community demand for local food, and the challenges of connecting consumers with producers (AFSA, 2013), although this report did not connect the local food distribution system to the issue of farmland loss in the county.

Four of the organizations did affect policy at municipal and/or provincial levels of government, to some limited extent, often using research and/or reports that they generated. For example, the Ecology Action Centre engaged with municipal politicians "to share provincial and national priorities around food" (EAC/HFPA Interview). The Halifax Food Policy Alliance sought to create a Halifax-wide strategic Food Action Plan that would "offer a framework of policies and actions that can, over a series of five to ten years, bring us closer in the Halifax region to where we need to be in terms of a more integrated … sustainable, healthy, just food system" (EAC/HFPA Interview). The Halifax-based NGOs also called for farmland protection in *Food Counts* (HFPA, 2014).

The Island Food Network's work included food issue "backgrounders" presented to council members in Cape Breton, some of whom found the results "startling" (IFN interview). Its lobbying efforts galvanized a councilor from the Municipality of the County of Victoria to attend the Island Food Network Food Policy Working Group meeting (IFN Interview). As further evidence of municipal impact, another councilor worked with Island Food Network members to launch a Cape Breton–based Mobile Food Market pilot, modeled after the Ecology Action Centre's successful Mobile Food Market in the Halifax Regional Municipality (IFN Interview). Additionally, in February 2019, the Island Food Network presented its *Shared Food Vision* to the Municipality of the County of Inverness, with the recommendation that the council delegate a liaison to the Island Food Network (*The Reporter*, 2019).

The most noteworthy policy impact from our case study was the No Farm No Food's well-run farmland campaign, which mobilized enough opposition that the Nova Scotia government overruled the local municipality and rejected the rezoning application to develop agricultural land as per the Municipal Government Act of Nova Scotia that was invoked to overrule the application (*The Advertiser*, 2010; Keddy, 2010; Starratt, 2012). Social movement justice work included FoodARC cohosting a major networking event in November 2014 with Food Secure Canada's 8th National Assembly *Waves of Change: Sustainable Food for All*, attended by over 450 people who included well-known luminaries such as the Indian scholar-activist Vandana Shiva.

Our case study NGOs also included one food policy council, the Nova Scotia Food Policy Council; one of the authors (GC) attended the founding meeting in Truro. A food policy council is a "voluntary body composed of stakeholders from the food systems as a whole, whose main task is to examine the functioning of a food system, and to provide ideas, means, and recommendations on how to improve it" (Dufresne, 2019, p. 366). Successful food policy councils are both autonomous of governments while also effective in promoting more inclusive social, economic, and environmental policy with local and regional governments (Gupta et al., 2018). The Nova Scotia Food Policy Council's core focus included efforts to shift provincial policy from imports and toward healthier and more locally grown food. We learned, however, that the council had ceased activities in 2014 (personal communication, former NSFPC board member). While the reasons for the Nova Scotia Food Policy Council's demise are unclear, its absence removed a pressure point on the provincial government, including its earlier campaigns to lobby the Nova Scotia government to create a Department of Food Security. The Halifax Food Policy Alliance sought to fill the policy gap by engaging primarily with the Halifax Regional Municipality and the private sector (EAC interview; HFPA interview).

At the federal level, policy work was far less common, a finding consistent with the research of McInnis et al. (2017). An exception was the Ecology Action Centre's "Eat Think Vote" campaign during the 2015 federal election, which resulted in a 2018 food policy framework, *What We Heard: Consultations on a Food Policy in Canada*, mandating improvements to the affordability, accessibility, and health and safety of the food system (EAC interview; Government of Canada, 2018). Whether the "Eat Think Vote" initiative was incorporated into local food security work in Nova Scotia is not clear.

Discussion

Before considering the findings, a couple of caveats are in order. First, only NGOs that had a primary focus on strengthening local food security or access to food were selected for this study, which likely excluded from the study smaller (one-off) initiatives or larger initiatives not directly related to food security. For example, the Confederacy of Mainland Mi'kmaq (CMM) conducts conservation initiatives protecting watersheds and fisheries (CMM, n.d.). Although undoubtedly important work that could warrant further investigation, these conservation efforts were not identified as directly related to food security through any of the three sets of sources used in this study nor on the CMM website itself. Second, study results were largely based on self-reporting. Using websites, news stories, and interviews with organization members

meant that this research was examining activities primarily through the lenses of the organizations conducting these activities.

The findings revealed that NGO food security work reflected numerous orientations and values regarding food system change, as well as different levels of citizen and state commitments (Friendly, 2008; Koc & MacRae, 2001; Lambek, 2019). In fact, many NGOs did not define themselves explicitly in terms of a particular food security orientation, or they consciously or otherwise worked with several concepts, values, and scales at any given time, which were sometimes coordinated but often not. Nevertheless, from our initial food studies literature review, we identified five orientations that spoke to tendencies in the work of the case study NGOs (Dufresne, 2019; Lambek, 2019). These orientations were community food security, household food insecurity, food justice, food sovereignty, and public policy. Based on the eight actions in Table 1, we next discuss the type of concrete activities that generally followed from each orientation.

The most common orientation was community food security (CFS), a "situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice" (Hamm & Bellows, 2003, p. 37). CFS works to improve whole food systems—networks of food production, processing and packaging, distribution and retail, and consumption—so that culturally appropriate food is equally accessible to all (Hamm & Bellows, 2003; Slater, 2007; Tendall et al., 2015). Prominent examples were FoodArc, the Halifax Food Policy Alliance, and the county-level NGOs' work on local food charters, community gardens, food skills training, food box programs, farmers markets, community kitchens, and forging farmer-fisher-consumer linkages. Core activities centered on organizing public events (e.g., the Island Food Network upskilling workshops), partnering with other organizations, engaging in community projects such as gardening training, food preservation workshops, food box programs (e.g., Ecology Action Centre), lobbying local governments (e.g., Island Food Network), publishing reports (e.g., ACT for CFS, the Antigonish Food Security Association's food assessment report), and, to a lesser extent, researching and voicing opinions (the Ecology Action Centre reports).

The Ecology Action Centre, Halifax Food Policy Alliance, FoodArc, and Antigonish Food Security Association, among others, also worked on household food insecurity, a second orientation, defined by the Canadian Community Health Survey as the "inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so" (CCHS, 2018, para. 1). Household food insecurity is frequently connected to being able to afford adequate food (Government of Canada, 2022). The NGOs sought to tackle household food insecurity for low-income households through community projects such as promoting farmers markets, fresh food initiatives, community gardens and greenhouses, and mobile food markets (e.g., Ecology Action Centre).

A third orientation, food justice work, addresses the structural inequalities on the production-distribution-consumption continuum by seeking to achieve "food security from below" (Dufresne, 2019, p. 363). The Halifax Food Policy Alliance's medium-term goal of bringing the Halifax Regional Municipality closer to a more integrated, sustainable, and just food system (e.g., a food charter), as well as FoodARC's call for a provincial living wage (ACT for CFS, 2015), could be construed as a food justice orientation. Key food justice actions included organizing events (e.g., with Food Security Canada) and partnering with other organizations. Publishing reports was also important: the Halifax Food Policy Alliance food justice report called for the Halifax Regional Municipality to promote urban agriculture and protect farmland.

A fourth orientation, food sovereignty, is defined by La Via Campesina as "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Food Secure Canada, 2020, para. 1). This concept has been employed differently, with some scholars emphasizing societal-generated change, as opposed to

policy reforms focused on influencing government decision-making (see Andrée et al., 2011). FoodArc and the Ecology Action Centre referred to food sovereignty in published reports, the latter defining it as the right of people to determine their food system (EAC/HFPA Interview). Similarly, during the Nova Scotia Food Policy Council's formative period there was discussion about how to shift Nova Scotia food expenditures from unhealthy food imports to "more healthy, locally-grown food" (*The Chronicle Herald*, 2012, p. A11). Practical actions of organizing public events, such as the Antigonish Food Security Association's "Seedy Saturday," might align with food sovereignty principles at a local scale. Members of both the Antigonish Food Security Association and No Farms No Foods also informally voiced support for broader food sovereignty processes, showing a willingness to move beyond localized or defensive actions such as farmland protection.

Policy work, the fifth orientation, seeks to influence government decision-making with the intent of producing specific decisions. In our study, policy actions were directed primarily at the municipal level, such as efforts to establish food charters and demands for regulatory support to farmers markets and urban gardens, as well as calls for greater interagency cooperation and the allocation of municipal staff hours to local food systems work. Public events were also organized, often in association with other NGOs, such as the Island Food Network and the Ecology Action Centre. No Farms No Food affected policy change by raising public awareness about farmland protection through radio messages. The municipal level has, in fact, been depicted in the literature as more accessible to shifting food priorities (McInnis et al., 2017, p. 802). Our findings were more nuanced, as even municipalities committed to sustainable food procurement policies and other initiatives—and not all were—must face the forces unleashed by "free trade" agreements, being constitutional creations of the provinces. Our exemplar policy success, No Farms No Food, itself struggles to "hold the line" (NFNF interview) against the short-sighted chipping away of farmland for new residential development as permitted by the Municipal County of Kings' recent Municipal Planning Strategy (Starratt, 2020). And across other Nova Scotia rural municipalities, farmland is generally in a precarious state (Cameron & Connell, 2021). On balance, the orientations of the NGOs tend toward striving to shift patterns of personal consumption rather than engaging in political action around food security (Johnston & MacKendrick, 2015).

Our use of the FAO definition and dimensions of food security ran up against certain limitations, given that the definition is generally aimed at high-level national and international goals and metrics, and hence could not capture the dynamics of local neighborhood food work and emergent solidarities. For example, the community gardens dotted across the Halifax Regional Municipality built environment may have led to real community empowerment and greater household food security, such as through better food utilization, but would have been invisible to the more static FAO definition. Or, had triangulation been conducted with Halifax Regional Municipality councilors or staff, for example, there may have been evidence of some (limited) local policy impacts. It is possible that our use of the FAO definition illuminates academic identification of organizational possibilities in isolation from the realities that activists face in getting people to a better place with food (Levkoe et al., 2023).

At the subnational level, however, one could argue that there have been no discernable changes across the four FAO criteria in Nova Scotia. Even from the viewpoint of the organizations themselves, the greater availability of domestic food production remains a gap. The reality is that Nova Scotia's food system remains largely centered on mass consumption of imported food, investor-owned firm-led growth, globally controlled food distribution networks, and ever larger farming systems, backed by federal-provincial policy frameworks (Andrée et al., 2016; McLeod-Kilmurray & Chalifour, 2019). At the federal level, a 2019 national food policy calling for a "healthier and more sustainable food system" (Agriculture and Agri-Food Canada, 2019, p. 3)— and provincial "buy local" campaigns—so far have not been able to reverse these structural trends and class configurations. Nevertheless, calls have intensified demanding that governments seriously support

family farms, sustainable agriculture, healthier living, animal welfare, and local and affordable healthy food (Agriculture and Agri-Food Canada, 2019; Dufresne, 2019; Lambek, 2019; McLeod-Kilmurray & Chalifour, 2019). Below, we sketch out a strengthened and triangulated research-action framework for employing the FAO criteria in a renewed Nova Scotia transition scenario, as one among other possible frameworks for place-based food system change.

What, then, should the next steps be for a research-action agenda aimed at strengthening Nova Scotia food security? It is our belief that a series of modest steps could begin the shift to a different sustainable food system by challenging "locked-in" government agri-food policy through what have been termed "joined-up sustainable food policies" (IPES-Food, 2016). An important first step would be to move beyond short-term socio-economic processes and impacts and toward longer-term objective-oriented research-action indicators (Eckman, 1996).

Evident throughout the findings, and critical to a research-action approach, was the role played by Nova Scotia's higher education institutions in participatory research design, knowledge mobilization, and community partnerships. Most of the more dynamic NGOs in the study were in close proximity to Nova Scotia universities, from Halifax-based organizations such as FoodArc (Mount Saint Vincent University) to county-level entities such as No Farm No Foods (Acadia University), the Antigonish Food Security Association (Saint Francis Xavier University), and the Island Food Network (Cape Breton University). Refocusing NGO-university partnerships could offer longer-term revisioning scenarios, in which the FAO definition could still be useful as a starting point if triangulated with other methods. A recent Health Canada Report has done just that, utilizing the four FAO dimensions to pinpoint the threats posed by climate change to Canada's food system and the need, among other measures, to reduce poverty, develop urban agriculture, repair the hunting routes of Indigenous peoples, and strengthen food safety (Harper et al., 2022). Furthermore, the FAO (2018) concept of sustainability—"food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised" (p. 1)—could help frame joined-up sustainable food policies. Napoli's breakdown of the four FAO dimensions to measure broad-based food system transformation is promising: food availability (e.g., arable land, food production index, permanent cropland); food access (e.g., the consumer price index, GDP per capita); food utilization (e.g., percentage of undernourishment, cereal waste); and food stability (e.g., import dependency ratio, food production index) (Napoli, 2010/2011). For example, small-scale pre-industrial farming is still within living memory of some older Nova Scotians, which, in the multiple forms revealed in our findings, could offer local-scale possibilities toward food system renewal, an asset that many other regions lack. Indigenous food practices may offer another potential ecological pillar for food system change through cross-cultural coalitions (Morrison, 2011). FoodArc's linkages with Mi'kmaq First Nations around traditional harvesting practices on mainland Nova Scotia and Island Food Network's outreach to Mi'kmaq communities on Cape Breton Island may offer glimpses of an eventual cultural shift among mainstream communities toward Indigenous worldviews.

Our study further revealed the critical relationship between NGOs as service providers and community-based organizations (CBOs) as self-help entities (Carroll, 1992). The growing emphasis on the social economy, including nonprofits, cooperatives, and community initiatives, could enable producers, distributors, and citizens to take some control back over the agri-food system (McInnis et al., 2017). This potential was reflected in our findings. Scattered over the Nova Scotia countryside were CBOs grounded in civic agriculture (localized agriculture and smaller scales of economy), alternative agriculture (food cooperatives, fair trade, organic practice), new agriculture (new niche sectors and family farm renewal), and Indigenous food systems (Lambek, 2019; McLeod & Chalifour, 2019). However, these diverse CBO forms do not necessarily signify a broad and cohesive food movement. Some NGOs and CBOs may value modest reforms to the agri-food system, while others may wish to transform it completely

(Levkoe et al., 2023). This tension was also evident in our findings and remains a challenge for systematically strengthening food security work in Nova Scotia in its varied dimensions.

Another concept that could aid in charting longer-term planning and joined-up sustainable food initiatives is known as institutional mapping (Fowler, 1996). Employed in post-Soviet and emergent-nations contexts from earlier periods and geographies, institutional mapping involves identifying scales (local, national), spheres of action (civil society-state), and actors both for and against a desired transition. Here, engagement with both government and civil society is equally crucial and mutually reinforcing (McInnis et al., 2017). For instance, without a robust grassroots base, NGO political work such as lobbying governments could be on "clay legs," as may have been the case with the Nova Scotia Food Policy Council and the Nova Scotia Food Security Network. Conversely, effective policy-level political action could support neighborhood-level CFS work, such as introducing scale-friendly regulations and stronger farmland protection, as well as support in the social sector via minimum wage reforms, private-sector unionization drives, and affordable housing projects (e.g., ACORN), all of which affect household food insecurity and/or food justice. Institutional mapping could also be employed to track the agri-food system's "blocking forces," including regulatory bureaucracies, political party-corporate-pro-industry networks, and top-heavy health and food safety standards (Johnston & MacKendrick, 2015). Most critically, institutional mapping could facilitate identifying a broader coalition of allies among civil society, media, academic and activist communities, political actors and parties, and Indigenous Peoples (Andrée et al., 2016; Fairholm, 1999; Wakefield et al., 2012). The reality remains that there is still significant work and alliance-building needed to achieve a consensus among food security actors around the "first principles" of food system transformation.

Conclusion

Since this study was conducted, indicators point to further deterioration of Nova Scotia's food security status post-COVID along the production-distribution-consumption continuum (Tarasuk et al., 2022). Visits to food banks in Nova Scotia were up 27% in the first two months of 2023 compared to the same two months in 2022 (Currie, 2023) as grocery prices rose, compounded by a generalized cost-of-living crisis. Record corporate profits along the agri-food supply chain (Oved, 2022) point to further concentration in the distribution sphere. On the production side, census farm numbers and farmland acreage have fallen by 21.4% since the 2016 census (Statistics Canada, 2022). Nova Scotia's food security situation post-COVID urgently needs research-action, including partnerships with local universities and CBOs. An additional research area could address why some of the NGOs fell by the wayside in food security work during our research —and perhaps since—due, possibly, to internal factors such as membership composition, internal governance, and mission overlap. Comparative studies of regions with similar farm and demographic profiles also offer possibilities for future research.

This paper sought to describe what NGOs in Nova Scotia are doing in the local food security space, spanning the rural county level to the provincial capital of Halifax. Each organization studied brought a unique set of research data, volunteer skillsets (e.g., practicing law, working in public relations or public health, farming) and knowledge from their neighborhoods of operation. Further, by creating reports and being featured in newspapers, the importance of local food security was brought forward on a somewhat regular basis in Nova Scotia. Although the reach of these organizations may have been limited due to the relatively small number of program participants, their experiences likely were significant to those who engaged in the outreach activities. For example, participants reported learning how to grow their own food and working in community gardens, gaining food processing and cooking skills that they could apply to their households, and maybe most importantly, accessing nutritious food that otherwise would have been difficult to attain. Despite all the obstacles encountered in this study, we believe that immense potential remains for a broad food movement to emerge in Nova Scotia that builds on the dedication and commitment of its food security NGOs.

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Appendix. Interview Guide

1. Tell us about your organization.
2. How does your organization define food security? What would be defined as a success in increasing food security?
3. Specifically, how does this organization try to impact local food security in Nova Scotia?
4. What initiatives have been undertaken to impact local food security?
    a. In what region?
    b. Impacts from these initiatives regarding…
        i. Utilization of the food system, increased knowledge
        ii. Improvement on food access
        iii. Improvement on food availability
        iv. Improvement on food affordability
5. Ask about specific projects undertaken by the organization as drawn from the media analysis and literature review.
6. Has this organization worked with other organizations on food security?
7. What has helped facilitate your work?
8. What have been the challenges your organization has faced in achieving goals?
9. What are your organization's future directions/initiatives?

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Values-based institutional food procurement programs: A narrative review

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Abstract

Food provided in school cafeterias, hospitals, prisons, and institutions of higher education is referred to as "institutional foodservice." Values-based institutional foodservice procurement programs are designed to prioritize certain values or criteria, such as environmental sustainability or local economies, in addition to price when purchasing food for institutional settings. Organizations and programs have been developed to provide guidance and monitoring for institutions seeking to adopt and implement values-based procurement programs. These programs have increased consumer and decision-maker awareness of opportunities to leverage institutional purchasing to support food systems change. Institutions that have adopted values-based procurement policies have documented increases in purchases of local, sustainable food from cooperatively and independently owned farms. While organizations supporting values-based institutional procurement have made documented progress in supporting food systems change, there have been difficulties with adopting and adhering to these organizations' standards. Because institutional policy adoption and implementation requires a substantial amount of effort, practitioners should be aware of these difficulties in advance of making purchasing commitments.

Keywords

Institutional Procurement, Foodservice, Higher Education, Values-based Supply Chains, Local Food Systems, Farm-to-Institution, Good Food Purchasing Program, Real Food Challenge, Sustainability, Social Justice, Transparency

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Introduction

Foodservice establishments—such as restaurants, caterers, and cafeterias—provide the bulk of food that is consumed outside of the home. In 2021, foodservice establishments supplied US$1.17 trillion worth of food (U.S. Department of Agriculture Economic Research Service [USDA ERS], 2022). One segment of this industry is the institutional foodservice sector, which includes hospitals, kindergarten through twelfth grade (K–12) schools, institutions of higher education, and prisons. The institutional foodservice sector has been estimated to account for US$200 billion in annual sales in the U.S. (Thottathil, 2019). Because of its large market size, institutional foodservice has the possibility to influence substantial change in food systems.

In this narrative review, I situate efforts to create positive change in food systems via institutional procurement programs under the broad heading of "values-based procurement" and describe common goals in values-based procurement. I describe the primary sectors of institutional procurement and the values-based programs that have been developed to guide and monitor purchasing in those sectors. I then discuss problems that have been identified with those programs. I conclude by discussing key considerations practitioners should take into account when considering adopting a procurement commitment or program.

Values-based Procurement

Values-based procurement prioritizes specific values or criteria in addition to economic indicators such as price (Thottathil, 2019). Values-based institutional food procurement (IFP) falls under the broad heading of values-based supply chains, which focus on "the incorporation of factors other than price in supply chain coordination, including social, health, and environmental values" (Klein, 2015, p. 637). Key elements that distinguish values-based supply chains from traditional supply chains include product differentiation (e.g., by product characteristics, such as organic, local, fair trade); committing to the welfare of all participants in the food supply chain; and creating partnerships based on trust and shared governance (Bloom & Hinrichs, 2011; Stevenson & Pirog, 2008). Key goals for contractual and policy changes in values-based IFP are shortening the supply chain, supporting local agriculture, improving equity and transparency, and advancing environmental sustainability, nutritional quality, and the livelihoods of workers along the supply chain (Farnsworth et al., 2019; Goger, 2019; Jones et al., 2019).

Because of the scale of IFP's market size and the fact that it sources only a small proportion of food locally, IFP has been called the "sleeping giant" in the local food movement (Clark, 2016; Thottathil, 2019). In values-based IFP, local purchasing and sustainable purchasing are often treated as synonymous due to a focus on "food miles" or greenhouse gas emissions from food transportation (Jones et al., 2019). Local food procurement efforts are supported by farm-to-institution programs that have the goal of improving access to both local and nutritious foods (Harris et al., 2012). Formalized contracts to ensure buying commitments and strengthen relationships between institutions and farms are a key strategy that can be used to support local food purchasing (Perline et al., 2015)

IFP can affect the health and wellbeing of consumers by ensuring the availability and access to safe, high-quality, and nutritionally adequate food. This is particularly important because core institutional settings—such as K–12 schools, hospitals, and prisons—serve vulnerable populations. Given its size and buying power, IFP is positioned to successfully support social and economic equity. For example, IFP can promote fair labor practices by purchasing food from sources that prioritize workers' rights and pay fair wages.

While third-party certifications play an important role in ensuring products have characteristics that consumers are looking for, the costs of the certifications are often borne by the food producers. The cost burden can make these certifications inaccessible to small farmers who do not have the resources available to receive a third-party certification (Jones et al., 2019).

Sectors of Institutional Food Procurement and Monitoring Programs

Several organizations and programs have been developed to support IFP programs with values-based procurement efforts and transparency objec-

tives by providing recommendations, guidance, and technical assistance for goal setting, measurement, and tracking of institutional food purchasing efforts. These programs differ in emphasis, level of specificity, and rigorousness of monitoring and reporting. Some programs are purely informational, while others require contractual relationships between an institution and a third-party verifier. Most of these programs focus on one sector of IFP because each type of procurement is subject to its own constraints. Historically, values-based IFP predominantly targeted K–12 schools, with a lesser focus on hospitals and institutions of higher education. In what follows, I review these three key sectors in IFP and programs that have been designed to support or monitor values-based procurement efforts in those sectors.

USDA farm-to-school programs in K–12 schools have laid the foundation for initiatives that leverage IFP as a mechanism for food systems change because of both the scale and the uniformity of the sector (Harris et al., 2012; Izumi et al., 2010). The National School Lunch Program (NSLP) is a federally assisted meal program that provides nutritionally balanced low-cost or free lunches to students at participating schools, administered by the USDA. In 2019, NSLP provided 4.8 billion lunches to children in the U.S. (USDA Food and Nutrition Service, n.d.). NSLP has specific nutrition standards for meals with which schools must comply in order to participate in the program (USDA, 2012). Schools that meet these requirements and participate in the program receive reimbursement from the USDA for each meal, with the amount of reimbursement depending on income level of the students enrolled at the school (USDA, 2017). The focus on supporting local economies and nutrition via the school food programs is at least partially justified by the fact that K–12 schools are spending public funds for food, and hence can be seen to have an obligation to pursue the public good with these public funds (Bloom & Hinrichs, 2011; Farnsworth et al., 2019; Harris et al., 2012). These nutrition standards, menu requirements, and reimbursement policies create a uniform set of standards for all K–12 schools participating in the NSLP, which makes this sector a prime target for developing policies and programs that can be replicated in school districts across the U.S.

Local food procurement in NSLP has been facilitated by USDA farm-to-school efforts as well as the National Farm to School Network (Izumi et al., 2010). Given the structure and uniformity of the NSLP, it is unsurprising that the most well-known and well-established values-based procurement program—the Good Food Purchasing Program (GFPP)—focuses on procurement in K–12 schools. GFPP was developed by the nonprofit organization LA Food Policy Council to help the Los Angeles Public School District make food purchasing decisions that support local and sustainable agriculture, promote healthy and sustainable diets, and ensure fair labor practices (Farnsworth et al., 2019). The GFPP is guided by five core values, which are connected by the key theme of transparency: local economies, environmental sustainability, valued workforce, animal welfare, and nutrition (Daniels & Delwiche, 2022; Farnsworth et al., 2019). The pursuit of these values is measured using a specific set of metrics and standards, which are used to guide institutional purchasing decisions and evaluate program performance. GFPP's standards recognize existing third-party certifications, but the organization also provides research and verification support to participating institutions to help identify products that meet the GFPP standards but may not have an existing third-party certification (Center for Good Food Purchasing, n.d.). The GFPP has been adopted by many school districts across the U.S., including the school districts in a number of very large U.S. cities, such as Los Angeles, Chicago, and Washington, D.C. (Daniels & Delwiche, 2022). GFPP highlights its flexibility in helping organizations select their own priorities for improvement within GFPP's certification framework and in helping develop plans to achieve those goals. However, GFPP requires that institutions meet baseline standards in all categories to prevent institutions from only committing to easy changes to their programs (Farnsworth et al., 2019; Jablonski et al., 2020; Lo & Delwiche, 2016).

The Real Food Challenge (RFC) has developed a set of standards, known as the Real Food Standards, to guide colleges and universities in their purchasing of "real food." Their standards classify real

food into four categories: fair, ecologically sound, humanely raised, and local and community-based. The first three categories are primarily focused on products meeting existing third-party certifications, while the local and community-based category is intended to be researched and verified by students or members of the participating institution (Real Food Challenge, 2016). The scale and complexity of foodservice programs at institutions of higher education make it infeasible for most universities to analyze all purchases, so RFC suggests deriving the "real food" percentage by averaging the results of a two-month analysis annually (Berger et al., 2022). Due to the complexity of university dining programs and the labor involved with auditing purchase data, some institutions have audited two months' worth of data on a subset of the dining operations, such as University of North Carolina (UNC) at Chapel Hill's choice to audit only two large dining halls for two months' worth of purchases (Cline et al., 2022).

GFPP and RFC provide the most specific value statements and metrics of values-based IFP programs. (See the Appendix for a comparison of GFPP and RFC's core values.) There are two other values-based IFP programs that provide more general guiding principles—Health Care Without Harm (HCWH) and Menus of Change (MOC).

There is increasing recognition that the food system impacts public health. Given their missions, some hospitals are seeking to support food systems change by committing to procure more local and sustainable food via farm-to-hospital programs (Dauner et al., 2011; Thottathil, 2022). Close to one third of U.S. hospitals have signed on to the Healthy Food in Healthcare Initiative developed by HCWH. Founded in 1996, HCWH is an organization that targets the hospital sector (Heilig et al., 2002). HCWH based its purchasing recommendations on the environmental nutrition model, which focuses on the connections between food, nutrition, health, environmental sustainability, and social justice. Environmental nutrition is based on the recognition that the food we eat impacts individual nutrition, as well as the environment, workers in the food supply chain, and the food system more generally (Klein et al., 2014). HCWH has three primary initiatives in their Healthy Food in Healthcare Program: people- and planet-friendly food, healthy food and communities, and food policy action to support sustainable food systems. HCWH recommends several practices to help achieve these goals, including reducing the amount of meat that is served and purchasing meat that is raised without the use of routine antibiotics, increasing purchases of sustainable foods and local foods, hosting farmers markets, screening patients for food insecurity, and establishing food-based interventions for community benefit (Health Care Without Harm, n.d.).

The Culinary Institute of America's Menus of Change (MOC) program is based on the beliefs that the food system has a significant impact on public health, the environment, and social and economic justice and that culinary innovation and sustainability can drive positive change in the food system (Menus of Change, 2020). The program focuses on promoting healthy, sustainable, and delicious food in the foodservice industry, with the ultimate goal of driving positive change in the food system. Unlike the GFPP or RFC, MOC does not have specific inclusion and exclusion criteria for products but instead has core values and principles to guide procurement decisions and menu creation. These principles include the promotion of plant-forward diets, the use of culinary innovation to drive change, and the integration of sustainability throughout the food value chain. The program emphasizes the importance of shifting toward diets that are rich in fruits, vegetables, whole grains, and other plant-based foods and that minimize the consumption of animal-based foods (Menus of Change, 2023). The MOC approach is intended to help the foodservice industry adapt to the growing demand for healthy and sustainable food and to support the development of a more diverse and vibrant food culture. MOC promotes the integration of sustainability throughout the entire food value chain, from production and processing to distribution and consumption (Menus of Change, 2023).

Institutions of higher education often contract with foodservice management companies to run their operations. Three large companies—Compass Group, Sodexo, and Aramark—dominate the university food service landscape (Friedmann, 2007; Santo & Fitch, 2019). They account for 45% of the

market in North America and jointly generated $37 billion in revenue in 2017, an increase of roughly 150% since 2004 (Goger, 2019; Santo & Fitch, 2019).

Institutional foodservice programs typically purchase the bulk of their food via broadline food distributors (Goger, 2019). They do so not only because of the scale of IFP but also because of long-standing organizational standards and practices (Goger, 2019). Hospitals participate in Group Purchasing Organizations, which can require them to purchase 80–90% of their food through specific food distributors, limiting their opportunity to purchase local or sustainably produced foods (Klein, 2015; Thottathil, 2019). The food distributors that institutions rely on to purchase food are also highly concentrated, with two companies—Sysco and US Foods—accounting for 75% of the market (Santo & Fitch, 2019). This concentration has been identified as a key obstacle for incorporating local purchasing into university foodservice programs because these distributors generally have limited availability of values-based products (Goger, 2019; Martin & Andrée, 2012)

Local, sustainably grown food is often more expensive than conventionally grown food from large farms. Institutions typically are constrained by limited financial and human resources available to support new programs, making price an overriding concern (Izumi et al., 2010; Kloppenburg et al., 2008). Lack of buying commitment, lack of formal contracts, and high turnover in institutions have also been identified as barriers limiting local purchasing (Perline et al., 2015). Values-based IFP can also encounter resistance from food suppliers or foodservice program operators who may not be accustomed to the requirements of a values-based food procurement program or may be generally resistant to making changes to their operations. Food service staff generally have limited and time resources, which can make them resistant to adopting new practices and procedures (Perline et al., 2015; Rosenthal & Caruso, 2019). It is important to be aware of the impact of workload and other practical limitations on school foodservice staff's ability to implement new policies (Rosenthal & Caruso, 2019). For example, food sourced from small producers may require additional cleaning and processing by foodservice staff compared to food sourced from broadline distributors. In addition, institutional foodservice program operators and chefs have limited ability to work with individual farms due to the coordination time required (Dauner et al., 2011; Harris et al., 2012; Perline et al., 2015).

The scale of the IFP market is both the reason that it has the potential to create change in the food system and the reason that there are difficulties with adopting values-based procurement initiatives (Klein, 2015). As discussed above, a key area of focus for IFP are farm-to-institution initiatives, which target increasing purchases of sustainable, locally produced food. The nature of the institutional value chain can make it difficult for small farmers or processors to meet the demands of scale and uniformity required by large institutional programs (Goger, 2019). The scale of institutional foodservice programs, in addition to the seasonality of local food, may make it difficult to source the quantity, variety, and volume of food required for the program (Berger et al., 2022; Cline et al., 2022; Harris et al., 2012).

Customer demand and preferences also influence institutional purchasing decisions. For example, several studies of the hospital sector noted that hospital staff perceive limited customer demand for local food, which limits their interest or motivation to develop local purchasing efforts (Abdul Rais et al., 2022; Dauner et al., 2011; Perline et al., 2015). Because universities need to sell meal plans to students, university dining programs have to consider student demand and satisfaction when making values-based purchasing commitments. For example, students may desire chicken tenders, which are only available from large food processing companies and may conflict with values-based procurement programs (Berger et al., 2022).

For both RFC and GFPP, the criteria for products to be considered "local" is not merely geographic. They also include limitations on farms' gross sales and ownership structures, requiring them to be independently or cooperatively owned (Center for Good Food Purchasing, n.d.; Real Food Challenge, 2016). These limitations on gross sales and ownership type preclude some farms from counting as "local." Institutions of higher

education require such large volumes of food that it may not be possible for institutions to purchase the quantity of food they need from farms that are geographically local, have sales below the gross sales limit, and are independently or cooperatively owned (Baldwin, 2017; Berger et al., 2022). Similarly, RFC does not count food from local businesses as "real food" if the ingredients used by those businesses were not sourced locally (Berger et al., 2022; Cline et al., 2022). For example, products from local bakeries that cannot source their flour locally could not be counted as "real" according to the RFC standards. For this reason, the standards have frustrated stakeholders by disqualifying vendors that campus stakeholders have wanted to support (Cline et al., 2022). Others have noted that sustainable food production practices are not one-size-fits-all and cannot be established for a locality without taking into account the specific environmental context (Jablonski et al., 2020).

RFC was designed to be used by institutions of higher education. However, after using it for close to a decade, foodservice stakeholders at Johns Hopkins University want to develop their own unique standards and targets for a local food procurement program "as part of a broader picture of local, sustainable, and ethical commitments, including maintaining facilities sustainably, valuing local workers, and measuring and reducing waste" (Berger et al., 2022). Similarly, UNC has also expressed an interest in developing their own standards that they could use in place of RFC but acknowledged that it would be resource intensive. Standards and metrics created at the institutional level raise questions of long-term legitimacy and accountability (Cline et al., 2022). When questioned about whether creating their own metrics could be considered greenwashing, Johns Hopkins University dining program stakeholders indicated that the university has resources and centers outside of the dining program that would be able to support the development of metrics and keep the dining program accountable (Berger et al., 2022).

Beyond the programs' standards being difficult to apply to local contexts or failing to reflect local values, shifts in program standards can negatively impact efforts that are already underway at an institution. For example, UNC Chapel Hill made a commitment to adhere to RFC 1.1 standards and implemented purchasing practices to meet those standards. When it came time for UNC to be scored for their efforts, they were scored according to the 2.0 standards without receiving notice that the standards had changed. Thus, UNC's dining program adhered to its purchasing commitment but received a lower score due to the new 2.0 standards (Cline et al., 2022) Specifically, the RFC changes between 1.1 and 2.0 standards introduced the above-discussed income cap on farms for them to be considered "local." This change in standards caused a decrease in the amount of food purchased by UNC Chapel Hill that could be classified as "real" according to the new RFC standards. However, the decrease in the amount of food that could be classified as "real" was not associated with a change in UNC's purchasing practices. The decrease in the amount of food they purchased that could be classified as "real" was due to the fact that a geographically local dairy from whom UNC purchased had income that was above RFC's newly established threshold for it to be considered local. Purchases from the dairy could no longer be counted as local according to the new Real Food Standards (Cline et al., 2022).

Many of these programs focus on changes that are "low-hanging fruit," changes that are easier to implement (Berger et al., 2022). In some cases, the organizations focus on helping institutions find ways to "count" products that they are already purchasing, for example, by identifying products or producers that meet certain standards. This actually provides a more accurate assessment of the institution's purchasing habits than the initial assessment did. However, finding items that can be counted toward goals can yield changes in scores without encouraging changes in practices. While it is good to acknowledge good practices that are already in place, some people may—intentionally or unintentionally—make the false claim that the programs are increasing purchases of "good" or "real" food. In reality, the practices are the same, and the institutions are just able to count food that they were already purchasing. It is good that they are making those purchases, but it misrepresents the situation to describe it as an increase or a change. As with the above-described situation with UNC, this issue

can also cut the other way—an institution may actually be making positive change in their practices, but a change in scoring could lead to a lower score.

If changing standards can change institutions' scores without any corresponding change in purchasing, it could be seen to call into question the whole enterprise of scoring procurement programs. Given that the purpose of these programs is to effect change in the food system by changing purchasing practices, changes in scoring that make program look better or worse without any change to the purchasing practices undermines the motivation that brought them into existence.

In addition, some have observed that this focus on low-hanging fruit is giving universities the opportunity to avoid making some of the most difficult procurement changes (Berger et al., 2022). This observation points to an objection that has been raised in the literature, namely, that the nature of IFP replicates some of the largest problems in our food system (Goger, 2019). Like many other segments of the agrifood industry, it is dominated by a few large multinational companies that wield disproportionate control over the market (Thottathil, 2019). IFP relies on efficiency, scale, and uniformity to deliver foodservice programs for the lowest price yielding the highest profit, and some have argued that even farm-to-school programs supporting nutritious, local produce in schools recreate many of issues that already exist in our food system (Allen & Guthman, 2006).

Thus, some food systems advocates object to the entire approach of focusing on institutional settings at all. They argue that targeting IFP as a tool for social change ends up replicating or reinforcing the values that progressive food systems advocates are seeking to change—unsuccessfully trying to promote change by working within current problematic systems rather than seeking to fundamentally alter them (Klein, 2015). Similarly, institutional procurement efforts have also been criticized for reinforcing the neoliberal ideal of utilizing capitalist market values and methods to influence change, rather than pushing the change via adoption and support of nonfiscal values and means (Allen & Guthman, 2006). A key question then, is "can values-based procurement initiatives in institutions integrate with conventional supply chains while maintaining the robustness of the values and goals that motivate them?" (Klein, 2015, p. 636). We don't yet know the answer to this question, but if the answer is "no," what is the way forward?

Conclusions

Values-based IFP thus has significant promise to influence positive change on the food system, but the institutional sector also has a variety of barriers that need to be addressed in order for institutions to make changes to their policies and programs. Programs exist to help institutions identify goals and priorities, and some of these programs, particularly GFPP in the K–12 sector, have had success in creating change. These programs, however, are limited by their inapplicability to local contexts, lack of representation of local stakeholder views, and logistical difficulties, which are particularly prevalent in institutions of higher education, due to the scale and complexity of those programs, and their consumer-focused, for-profit business models.

If an institution is considering adopting a values-based procurement policy—a formal contractual agreement, such as enrolling in GFPP, or simply selecting a set of principles to use to guide purchasing decisions—the following six questions are useful to consider in evaluating options and making that choice.

1. *Institutional Sector:* Is this program or set of principles designed to be used by this sector of institutional procurement operations? If not, how hard would it be to modify or adjust them to fit this sector?
2. *Institutional Values:* Do the values and commitments embedded in this program reflect the values that this institution holds? If not, could this adoption create conflict within the institution, stakeholder groups, or the end users of the program?
3. *Agricultural Context:* Do the metrics in the values-based program match the agricultural context of the location of the institution, including requirements related to farm ownership and production practices? Can the volume and types of products

required by the program be sourced consistently with the program requirements? If not, what adjustments would need to be made, and are they feasible?

4. *Administrative Effort:* How much work will be required by the institution to participate in this program? Will additional staff or staff time be required to collect data or manage reporting?

5. *Cost:* Is there a direct cost to enroll or participate in the program? Will there be additional costs for food purchases meeting the program's specifications? If so, who will bear the burden of those costs—the consumer, institution, or foodservice management company?

6. *Operational Effort:* Will this program require additional time, effort, and training for staff to create new menus, handle minimally processed foods, and implement new policies and practices? If so, is there staff buy-in, and do they have the time, skills, and resources to take on these new responsibilities?

Each of these questions highlights the real-world difficulties and implications of adopting a values-based IFP program. There is a general tension between having standard metrics that apply across all contexts to allow for apples-to-apples comparisons between institutions and having metrics that are uniquely applicable to a local context. While one specific values-based framework may not uniquely fit a particular institution's food-service program, there is also a substantial burden of time and effort involved in building a values-based IFP framework, and individual institutions may not have the time and resources available to do so. While change is always hard, the overall goal of these programs is to make changes at the institutional level that can support broader change in local and regional food systems.

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Appendix. Comparison of Good Food Purchasing Program and Real Food Challenge Standards and Value Statements

	Good Food Purchasing Program[a]	Real Food Challenge[b]
Sustainable	"**Environmental Sustainability:** Source from producers that employ sustainable production systems to reduce or eliminate synthetic pesticides and fertilizers; avoid the use of hormones, routine antibiotics and genetic engineering; conserve and regenerate soil and water; protect and enhance wildlife habitats and biodiversity; and reduce on-farm energy and water consumption, food waste, and greenhouse gas emissions. Reduce menu items that have high carbon and water footprints, using strategies such as plant-forward menus, which feature smaller portions of animal proteins in a supporting role."	"**Ecologically Sound:** Farms, ranches, boats and other operations involved with food production practice environmental stewardship that conserves biodiversity and ecosystem resilience and preserves natural resources, including energy, wildlife, water, air, and soil. Production practices should minimize toxic substances, direct and indirect greenhouse gas emissions, natural resource depletion, and environmental degradation."
Local	"**Local economies:** Support diverse, family and cooperatively owned, small and mid-sized agricultural and food processing operations within the local area or region."	"**Local & Community-Based:** These foods can be traced to nearby farms, ranches, boats and businesses that are locally-owned and operated. Supporting small and mid-size food businesses challenges trends towards consolidation in the food industry and supports local economies."
Social and Economic Equity	"**Valued workforce:** Ensure that food suppliers respect workers' rights to freedom of association and to bargain collectively for better wages and working conditions, free from retaliation."	"**Fair:** Individuals involved in food production work in safe and fair conditions, receive fair compensation, are ensured the right to organize and the right to a grievance process, and have equal opportunity for employment."
Animal welfare	"**Animal welfare:** If animal products are a featured menu item, source from producers that provide healthy and humane conditions for farm animals."	"**Humane:** Animals can express natural behavior in a low-stress environment and are raised with no added hormones or non-therapeutic antibiotics."
Nutrition	"**Nutrition:** Promote health and well-being by offering generous portions of vegetables, fruit, whole grains, and minimally processed foods, while reducing salt, added sugars, saturated fats, and red meat consumption and eliminating artificial additives. Improving equity, affordability, accessibility, and consumption of high quality culturally relevant Good Food in all communities is central to our focus on advancing Good Food purchasing practices."	N/A

[a] Center for Good Food Purchasing, n.d.
[b] Real Food Challenge, 2016.

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Locally supported, values-based framework for a university foodservice program: Results of a Delphi study

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Abstract

Institutional foodservice programs provide food in kindergarten through twelfth-grade (K–12) school cafeterias, hospitals, prisons, and institutions of higher education. Values-based procurement prioritizes certain values or criteria in addition to price. Institutions where values-based procurement policies have been adopted have increased the proportion of procurement dollars that go to local farms and are spent on products receiving third-party certifications for sustainability, farmworker justice, and animal welfare. Several programs exist to support institutions seeking to adopt and implement values-based procurement practices. However, there have been difficulties with implementing programs that have metrics that were not designed based on the local context where the institution is located, particularly for institutions of higher education. This study used the Delphi technique to identify expert consensus on values and metrics based on the local context that could be used as the foundation for a values-based framework for a university dining program. Our study identified eight core values and six categories

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Conflict of Interest

The authors have no conflicts to disclose.

of metrics that were supported by local and regional food systems stakeholders at the University of Florida and in the surrounding community. Other higher education institutions can apply and adapt these values and metrics to their local contexts or can use our consensus-building process as a model to develop a set of values and metrics for their institutional procurement program, tailored to their local context.

Keywords
Institutional Procurement, Foodservice, Higher Education, Values-Based Supply Chains, Local Food Systems, Farm-to-Institution, Delphi, Good Food Purchasing Program, Real Food Challenge, Sustainability, Social Justice, Transparency

Introduction

The institutional foodservice sector, which serves hospitals, K–12 schools, institutions of higher education, and prisons, represents a large market opportunity; it has been estimated to account for US$200 billion in annual sales in the United States and is predicted to continue growing (Thottathil, 2019). Because of the scale of the institutional foodservices market, it has substantial buying power and thus can critically impact the food system (Louie, 2019; Thottathil, 2019). Values-based IFP prioritizes specific values or criteria in addition to economic indicators such as price (Farnsworth et al., 2019; Santo & Fitch, 2019; Thottathil, 2019).

Values-based IFP most commonly focuses on sourcing local and sustainable food to support the local economy and reduce the environmental impact of food production and distribution (Stevenson & Pirog, 2008). Local food procurement is often connected with health and nutrition by focusing on sourcing local fruits and vegetables to improve the nutritional quality of foods that are provided in institutional settings (Feenstra & Ohmart, 2012). There is an increasing interest in purchasing food from suppliers that adhere to fair labor standards and pay their workers a fair wage to support the equitable treatment of workers throughout the food system (Jones et al., 2019).

IFP is an opportunity for institutions to align their purchasing with their stated values and be transparent with consumers about their procurement practices (Farnsworth et al., 2019). Many institutions have values or missions that relate to sustainability, social responsibility, or health. Devoting their purchasing dollars to vendors and products that foster those values is a tangible way to demonstrate their commitment to those goals and values (Farnsworth et al., 2019). Consumers are also increasingly demanding transparency, particularly via third-party certifications and monitoring of these aspects of IFP (Jones et al., 2019). There are several organizations that support values-based IFP programs by providing recommendations and guidance for adopting values-based procurement commitments and monitoring progress toward goals. Good Food Purchasing Program (GFPP) is the most well-known and well-established values-based procurement program. It primarily focuses on procurement in K–12 schools. Real Food Challenge (RFC) is a program that focuses specifically on food procurement efforts in higher education. For an overview of existing values-based IFP programs, including GFPP and RFC, see Campbell (2023).

While values-based IFP has the capacity to facilitate food systems change, there are general difficulties with implementing changes in this sector and specific difficulties associated with existing values-based IFP programs (Campbell, 2023). These problems include practical concerns about what is required to participate in these values-based IFP programs. For example, RFC has been criticized for not taking into account the viewpoints of people who work in the university foodservice program (Berger et al., 2022), GFPP requires substantial staff time to collect data to share with the Center for Good Food Purchasing and funding to pay for data analysis and institutional certification (Richbart, 2017). There are also problems with the specific metrics that the programs use. For example, there is an acknowledgement that many programs, including RFC and GFPP, have yet to fully incorporate metrics and goals in areas of diversity, equity, and inclusion (Berger et al., 2022; Stoscheck, 2016). RFC standards have frustrated stakeholders because of constraints that disqualified vendors because their food did not count as "real," even though campus stakeholders wanted to support them (Cline et al., 2022). The problems

associated with implementation and metrics have been particularly acute for institutions of higher education due to their scale, complexity, and for-profit status.

These complaints point to a general issue with these programs, namely, that there is a consistent tension between programs having standardized metrics across the United States to allow for "apples-to-apples" comparison and having programs that are targeted toward and applicable to local contexts, goals, and values (Berger et al., 2022; Cline et al., 2022). The critical role that social, political, economic, cultural, and biophysical processes play in food systems and agricultural practices highlights the importance of place-based approaches to policies and standards in IFP (Jablonski et al., 2020).

The tension regarding the applicability of standardized metrics has been identified with GFPP, as the metrics developed by stakeholders local to Los Angeles have been found not to fit naturally into other environmental contexts. This lack of fit has led some to reject generalizable sustainability standards and instead to call for place-based approaches that support local, democratic, outcome-oriented strategies (Jablonski et al., 2020). For example, USDA-certified organic is considered the highest-level criterion for sustainable purchases for GFPP. However, organic production often requires the use of tillage in lieu of herbicides. In drought-prone areas using production methods that require tillage can have negative environmental impacts—meaning that what was considered as the highest priority for sustainability for stakeholders in Los Angeles can yield negative environmental impacts for other areas and climates (Jablonski et al., 2020).

Therefore, a study was needed to develop values-based IFP policies and standards that take into account the unique social, political, economic, cultural, and biophysical processes in local food systems. These policies should also take into account the specific needs and perspectives of stakeholders across the food system who are involved in or affected by a large-scale university foodservice operation. While there is a substantial body of literature regarding the contextual values and the values and motivations of stakeholders associated with farm-to-institution programs (Conner et al., 2014; Izumi et al., 2010; Rutz et al., 2018), the purpose of this study was more practical and forward-looking. The motivation for this study was that there have been difficulties with implementing existing values-based IFP frameworks at institutions of higher education. In addition, the nature of the agricultural sector in the Southeast United States is potentially incongruent with the specific metrics used by existing programs. The purpose of this study was to identify consensus from local food systems stakeholders on what values they think a university dining program in their community should support and what metrics could be used to monitor that support. In this article, we discuss the methodology and results of a community-engaged research study to identify core values and metrics that could be used to monitor a values-based university dining program in Florida. We conclude by discussing the results of our study, how they compare with existing programs, and potential avenues for application and adaptation of our results and methodology in other contexts.

Study Context

University of Florida (UF) is a large land-grant institution that is home to Florida's Cooperative Extension Service. UF comprises 16 colleges and 90 research centers and has 94 undergraduate programs and 224 graduate programs (Institutional Planning and Research, n.d.). The university has a 2,000-acre campus, with more than 1,000 buildings (including 170 with classrooms and laboratories; Institutional Planning and Research, n.d.). UF has over 30,000 faculty and staff and roughly 61,000 enrolled students; UF residence halls on campus have a total capacity of more than 7,500 undergraduate students, and its four family housing villages accommodate more than 1,000 married students and graduate students (Institutional Planning and Research, 2023).

Aramark, one of the largest foodservice providers worldwide (Jones et al., 2019), had had the foodservice contract at UF from 1996 to 2022. Despite substantial efforts in the university and surrounding community to effect change in Aramark's procurement practices over the years to support more local, sustainable purchasing, for

example, the program had seen little improvement. Some food systems advocates argued that the then upcoming change in contract was an opportunity to enshrine commitments from the foodservice provider in contractual policy (Prizzia, 2021). Beyond interests in local purchasing and sustainability, there were local protests and boycotts from food justice activists who objected to Aramark's alleged exploitation of workers (including the use of prison labor) and their general lack of transparency (Xiuhtecutli et al., 2021). Alachua County, where UF is located, had recently adopted GFPP for their public school system and jails, making that third-party certification framework a potential option for UF to consider in their new food and beverage services contract (Ivanov, 2021).

In 2019, UF commissioned a foodservice master plan to overhaul its dining program to "provide a value-added experience to all campus constituents and support the overall university's brand as it strives to become a top-5 public institution in the country" (Brailsford & Dunlavey, 2019). The master plan recognized that the then-upcoming contract change provided key opportunities. First, it provided an opportunity to better align the dining program with UF's brand and values. It also provided the opportunity to increase value to students by improving the quality, variety, and service in the program. The plan also highlighted the opportunity to leverage the university's many existing community, research, and academic resources to improve the program. The plan specifies, however, that these improvements in the dining program would need to be balanced with the cost of changes and the anticipated impact on the efficiency and operation of the program (Brailsford & Dunlavey, 2019). This balance is essential because the costs of the program are ultimately borne primarily by the students, as well as some faculty and staff who utilize the dining program (Brailsford & Dunlavey, 2019). Despite UF's recently achieved status as a top-five public university, the UF student community still struggles with substantial levels of food insecurity (El Zein, Mathews, et al., 2018; El Zein, Shelnutt, et al., 2019), making the affordability of the program a key consideration. Thus, the new dining contract provided a key opportunity to improve the quality of the dining program and to enshrine in the contract institutional commitments for values-based purchasing to address concerns about ethical issues, support local agriculture, increase program satisfaction, and improve affordability.

In light of the above-discussed issues with existing programs and the call for standards embedded in local contexts, our research team saw the public awareness of this institutional foodservice program and its associated tensions as a prime opportunity. We aimed to identify consensus on a locally supported, values-based framework for UF's dining program that takes into account the diverse perspectives of students, university operations staff, university researchers, and members of the community at large.

Methods

The Delphi technique is used to reach consensus through a structured research methodology utilizing anonymous communication with a group of individuals who have expertise in a specific topic, with the goal of leveraging this consensus to guide policy or practice (Hsu & Sandford, 2007). While there are variations in format, the standard Delphi study consists of a purposive sampling technique, multiple rounds of structured anonymous communication between participants, and thematic analysis of data (Hsu & Sandford, 2007; Linstone & Turoff, 2002). Our study adhered to the standard format, utilizing three rounds of communication from the panel (Hsu & Sandford, 2007).

The Delphi panel was composed of a purposive sample (n=32) of individuals representing local perspectives on values and priorities for a values-based procurement program. Panelists were recruited to represent the topics that are a frequent focus of values-based IFP programs. Representing the interests of farms and agriculture were local farmers, state and regional Cooperative Extension agents, and research faculty at UF who specialize in agriculture, small farms, food safety, and supply chain engineering. Representing health and nutrition, the panel had registered dietitians and UF research faculty in community health and human nutrition. Individuals specializing in university operations including business services, recreational sports, the university athletic association, student affairs, disability resources, diversity, housing,

marketing, and sustainability were included on the panel. Because the campus dining program first and foremost serves the student body, the panel included representatives of campus organizations and members of the student community, including undergraduate and graduate students, with a focus on students who had prior knowledge and experience with sustainability, food systems, and/or the dining program. The panel also included individuals who were members of organizations supporting farmworker rights and social justice, as well as representatives of the City of Gainesville and Alachua County, Florida.

Data Collection and Analysis

Delphi panel participants were invited to participate in March of 2022. The first round of data collection occurred between March and April of 2022. In the first round, participants provided open responses about their perceptions of the core values that should be used to guide institutional food and beverages procurement practices. They also responded to questions about key metrics and measures that could be used to track adherence to and progress toward values-based institutional procurement goals. The research utilized a deductive and inductive thematic coding approach with two rounds of coding. First, the research team developed a codebook based on a review of the core topics and themes in values-based institutional procurement programs, including GFPP, Healthcare without Harm, RFC, and Menus of Change. The team used the codebook to deductively identify the following codes: sustainability, local economy, workforce, fairness/justice, cultural diversity, local community, animal welfare, nutrition, and food safety. For each topic there were two codes—one for value statements and one for metrics related to the topic. Inductive codes were applied to topics that were not anticipated in the codebook. Codes that were identified inductively were operational excellence, customer satisfaction, transparency, and third-party certifications.

In the first round, two members of the research team coded the data independently, with a third member of the research team reviewing both sets of codes. In the second round, codes were organized into themes, combining some of the first-round codes into one theme, such as nutrition and food safety. The lead researcher used the coded data to create a list of the values and metrics that emerged from the first round of data. While the first round of data collection did not explicitly ask for third-party certifications, many participants included third-party certifications or programs in their responses, so third-party certifications were added to the list.

In the second round of data collection, the Delphi panelists were presented with the list of values, metrics, and third-party certifications that were developed from the round-one data collection. Panelists were asked to rate the importance of each of the value statements, metrics, and third-party certifications using a 5-point Likert-type scale (1 = *not at all important* and 5 = *very important* or 1 = *strongly disagree* and 5 = *strongly agree*) in an online survey (Qualtrics, Provo, UT). The second round of data collection occurred in July and August of 2022. An *a priori* definition of consensus as two-thirds of the expert panel selecting a 4 or 5 (important or very important, agree or strongly agree) was used for an item to be retained in the study. Items that two-thirds of the panel did not rate important or very important were removed, yielding the list of values and metrics that was distributed in the third round. The third and final round of data collection occurred in September of 2022. The panelists were presented with the shortened list of core values and metrics and again asked to rate the importance of each item.

Results and Discussion

The final results of the study found consensus around eight core values that should be used to guide university food and beverage services purchasing programs, with metrics and measures for six of those eight categories. None of the third-party certifications that were included in round two of data collection reached the two-thirds threshold of importance to be retained for the third round of data collection. The eight core values are excellence, integrity, and authenticity; fairness, justice, and workforce; environmental sustainability and stewardship; local economies; nutrition and food safety; cultural diversity; community connections and partnership; and animal welfare. The final list

Table 1. Summary of Values and Metrics for Each Round of the Delphi Study

	Initial List		After Round 2		Final Results	
Category	Values	Metrics	Values	Metrics	Values	Metrics
Excellence, Integrity, and Authenticity	12	8	11	7	11	5
Fairness, Justice, and Workforce	14	16	9	13	8	8
Environmental Sustainability and Stewardship	8	15	8	6	8	6
Local Economies	7	8	6	6	6	6
Nutrition and Food Safety	6	8	5	6	5	5
Cultural Diversity	4	6	4	6	4	5
Community Connections and Partnership	6	6	5	0	4	0
Animal Welfare	4	4	2	0	2	0
Third Party Certifications	n/a	22	n/a	0	n/a	0

included metrics and measures for only six of the eight categories of values. (See Table 1 and Appendices A and B.) While metrics were proposed in round 1 for animal welfare and community connections and partnership, no metrics were retained.

Excellence, Integrity, and Authenticity

As discussed in the introduction, transparency and accountability are important values and motivators for many of the values-based IFP programs and principles. In our analysis, we subsumed transparency and accountability under the theme of integrity and authenticity, because being transparent about program operations and providing documentation shows that the program is being operated with integrity and authenticity. Our Delphi panel believed a number of principles related to transparency and accountability should guide an institutional food and beverages services program: adoption of key performance indicators, transparency in program operations by generating publicly available verification reports for pledged metrics/benchmarks, oversight of the program in the form of an advisory board, and providing customers with increased access to information about the products purchased and sold through the dining program. In other programs, such as GFPP, transparency and accountability are considered to be the core motivation for adopting the program and the thread that runs throughout the program's values and metrics, rather than being a separate value with metrics of its own.

"Excellence," or customer satisfaction, was not a value that was prevalent in most existing values-based IFP programs, such as GFPP or RFC. For our panel, program excellence was represented in the values of providing high customer satisfaction, a pleasant atmosphere, delicious and satisfying food options, and high-quality food and service. Given that UF's dining program is a for-profit program, it is understandable that the panel would see consumer satisfaction as a core value to guide its implementation. Price-consciousness was present in the values of not only supporting the economic viability of the program, but also providing fair and competitive pricing for meal plans and ensuring the affordability of food on campus.

Identified metrics to monitor program excellence included growth in gross sales, meal plan purchases, and number of diners utilizing the program. Monitoring the cost of meal plans and food options was also identified as a metric of program excellence. Finally, monitoring customer satisfaction was identified as a key metric, which parallels the recommendations of the dining program's 2019 master plan. This metric indicates a need to increase customer satisfaction with the dining program in order to be competitive with peer institutions.

Fairness, Justice, and Workforce

The core values in the fairness, justice, and workforce theme focus not only on workers along the food supply chain but also on the treatment of employees working in the campus dining program.

Our panel's inclusion of values and metrics related to employees of the dining program differs from GFPP and RFC. Because those programs are about *food procurement*, they focus on the treatment of workers in relation to the food that is purchased by the institution, that is, farm workers. Those programs do not focus on the treatment of workers in the foodservice program itself, which is a matter of business operations rather than procurement. Our panel agreed on the importance of dignified, safe, and socially just working conditions for workers throughout the food supply chain, including people who work in the dining program on campus. For campus employees, core values included providing a competitive wage scale, supporting professional growth and advancement, and ensuring worker safety. The values also included improving job security, increasing employment opportunities for students, and supporting grievance filing and redressing protocols. Another core value under the theme of fairness was supporting food security and food access on campus.

Metrics in this category included percentage of procurement dollars paid to producers or paid for products that meet third-party standards for fair labor practices. Adherence to several of the metrics in this category is legally required, including monitoring to ensure that program meets health department requirements, tracking the number of worker safety incidents or non-compliance events, and meeting Department of Labor requirements, as well as employee pay and time monitoring. Worker satisfaction was also recognized as important, including collecting employee feedback on worker satisfaction, providing worker benefits, and establishing a living wage benchmark for employees.

Environmental Sustainability and Stewardship

The Delphi panel supported a number of sustainability values, including reducing the program's carbon footprint, use of natural resources, and waste, while increasing the purchases of more sustainable products or the proportion of purchases from vendors using environmentally sustainable practices. The panel thought it was important for a values-based IFP to align itself with the sustainability goals of the institution and to have honest marketing and communication about environmental sustainability. In the open responses in the first round of the study, a number of panelists mentioned the importance of not "greenwashing" the program by making false or misleading claims about sustainability of products or practices.

Metrics for monitoring the sustainability of the program included year-over-year improvement in standardized sustainability metrics. The panel recommended monitoring food waste, including reduction in total waste and waste-to-purchase ratios in addition to tracking food waste in pounds and creating an annual carbon footprint report. Parallel to our panel's focus on worker conditions across the entire food supply chain, tracking the above sustainability metrics requires more active internal monitoring of the operation of foodservices than GFPP and RFC require. The sustainability metrics for GFPP and RFC rely more on third-party certifications of products that are purchased by foodservice operations, such the percentage of products that are USDA-certified organic, American Grassfed Association–Certified Grassfed, Marine Stewardship Council Certified, and Animal Welfare Approved.

Local Economies

For local economies, panelists thought that having seasonal menus based on food availability in Florida was an important value, as well as supporting small-scale, family, or cooperatively-owned farms and increasing purchases of Florida-grown food items. The panel also identified core values that would reduce IFP program barriers that typically limit opportunities for small farms and food businesses. These included establishing relationships with and collecting input from local producers to identify and address salient challenges; supporting infrastructure for local procurement, such as cold storage, distribution services, meat processing facilities, and stop-gap insurance; and reducing administrative burden for local farms and food businesses.

The metrics for the local economies theme were some of the most straightforward and had the most consistent support from the panel (See table 1). These metrics included tracking the percentage

of menu items featuring in-season produce, tracking food miles from the farm to the service destination, monitoring purchasing from local farms and food businesses for year-over-year increases, and tracking the percentage of procurement dollars spent on Florida-grown products, food produced from local farms, and products from local food businesses. We also asked the panel to rate the importance of specific geographic measures for purchases. The panel agreed that sourcing food from within institution's county or adjacent counties, within a 250-mile radius, and grown within the state was important. The panel did not think that Georgia-grown, grown in the southeast US, or domestically grown were important priorities for a values-based IFP program. GFPP and RFC local food purchasing programs include requirements related to farm ownership, gross sales limits for farm operations, and local-sourcing of ingredients (Campbell, 2023). While our panel supported a value statement about small and/or cooperatively owned farms, they did not identify those characteristics as being salient for the metric of a product being considered "local." Our panel had a more inclusive definition of local, including food businesses, not just farms, as well as farms of all sizes, ownership structures, and production methods. This perspective on local farms may have been seen to coincide with the nature of the agricultural sectors in Florida and the volume requirements to sell to an institution like UF, which serves 25,000 meals a day.

Nutrition and Food Safety

As a core value, panelists thought a values-based IFP program should contribute to the overall health of students and customers by providing products of high nutritional quality while supporting diverse dietary patterns and consumer preferences. Food safety was also identified as a core value, with conducting food safety monitoring and ensuring vendors comply with food safety standards as measures. It is worth noting that many food safety policies and the monitoring thereof are required by the Department of Health, and, thus, could arguably be thought of as legal requirements rather than optional, values-based policies for institutions to adopt.

The panel also thought nutrition awareness and knowledge was an important value. Interestingly, despite early inclusion of metrics related to increasing awareness and education about nutrition as a part of the program, there was no consensus around the importance of any metrics associated with increasing nutrition awareness or knowledge. However, there was consensus on the importance of tracking the nutrition content of foods, as well as tracking the percentage of menu items providing nutrition content information and the percentage of procurement dollars spent on fresh produce and nutrient-dense foods. Unlike our panel or GFPP, RFC does not include nutrition or food safety in their standards. While our panel did have nutrition and food safety as a value with associated metrics, our panel had some differences in focus as compared with GFPP. Unlike GFPP, our panel did not focus on level of processing, that is, reducing the proportion of processed foods, but instead focused on increasing nutrient-dense foods. Under their nutrition priorities, GFPP includes "health equity," which concerns expanding food access to low-income residents or communities of color. In our study, there was early inclusion of the value of expanding access to food in the broader Gainesville community, but it did not reach the level of support required to be included in the final results.

Culturally Diverse

Key values in the theme of cultural diversity focused on the types of food products that are available in the program as well as where the products are sourced from, including supporting culturally sensitive food options. This value also focused on increasing sourcing from diverse vendors, farms, and food businesses, specifically focusing on women- and minority-owned farms and food businesses. Some of the key values in the culturally diverse category go beyond procurement practices and include internal program operations, such as adopting and strengthening diversity, equity, and inclusion protocols, supporting a culturally diverse workforce, and establishing goals for supervisor diversity to represent staff diversity.

Important metrics for cultural diversity are tracking both the percentage of procurement dollars on purchases from minority-owned farms and

food businesses as well as the number of those farms and food businesses from which the program sources products. Other metrics for diversity include tracking the number of food alternatives available for both cultural or religious food restrictions, such as kosher or halal, as well as alternatives available for voluntary diets or food restrictions, such as paleo or keto diets. GFPP and RFC have been criticized for not including metrics related to equity and diversity, making the articulation of these values and metrics from our panel an important contribution to the values-based IFP landscape.

Community Connections and Partnership

For community connections, the panel thought that it was important that the program align with the institution's stated goals and values. They also thought an important value was to maintain internal institutional partnerships with colleges, centers, and institutes and to serve both the student community and the local community external to the institution. As mentioned above, the panel thought that community connections and partnership were important values to underpin a values-based IFP program, but there was no consensus around metrics for that value.

Animal Welfare

Animal welfare was identified as a core value for a values-based IFP program, specifically with the value of supporting humane or cruelty-free offerings and increasing purchases of products and from suppliers with third-party animal welfare certifications; however, there was no consensus on metrics associated with this value. There were metrics in round two, such as tracking the number or percentage of menu items that were meat-free or the percentage of products that had a third-party animal welfare certification, but these metrics did not receive the support necessary for their inclusion in the final list of metrics. In addition, the lack of metrics for both community connections and animal welfare introduces the question of whether those items are harder to measure, whether there is less consensus about the right way to measure them, or whether panelists simply view those as important values but do not think it is important to measure or monitor any specific metrics in order to ensure that those values are supported in a values-based IFP.

Third-Party Certifications

Despite the interest in transparency and the inclusion of third-party certifications in people's open responses, none were retained after the second round in the Delphi study. This finding is perhaps the most salient difference between our results and GFPP and RFC, which rely heavily on third-party certifications. RFC has four categories of standards, and three rely on third-party certifications. GFPP has five categories of standards and rely on third-party certifications for three areas. These programs use third-party certifications to identify products that support animal welfare, environmental sustainability, and fair treatment of workers.

Summary

This study was designed to identify core values and metrics for a values-based IFP program that were rooted in the local context of the University of Florida, taking into account its large scale, operational needs, its status as a land-grant university, and the agricultural sector in the community and around the state. Additionally, bringing together the perspectives of students, food systems advocates, farmers, elected officials, managers, and others yielded a unique perspective to the resulting list of values and metrics. The list represents the ideals and values of the community as well as the business and administrative realities for a program of the scale of UF's dining program. Despite the representation from business-minded panelists, values and metrics related to justice for farm workers and wages for workers were still deemed to be important, providing evidence that the university supports some of the values that motivated the local protests leading up to the adoption of a new contract.

There are inherent limitations with using the Delphi technique. Even though we sought to have experts from all aspects of the university community on the panel, because these data are based on expert consensus, the results are not necessarily reflective of the broader university community's viewpoint. Indeed, some could argue that for mat-

ters of value in food systems, consulting only food systems experts and food systems advocates would be more appropriate than seeking perspectives of people who run the program or the students who utilize it. However, our understanding of the purpose and mission of the program, as well as our understanding of the realities of adopting and implementing policies and goals for the program, required taking into account the perspectives of the people who would be overseeing and implementing the policies and the end-users who would ultimately utilize the dining program.

While this study sought to identify metrics that could be the basis for a values-based IFP program, it is worth noting that many of the metrics are somewhat vague and still require interpretation or more specificity before they could be utilized to track the performance of a program. This level of generality may be beneficial, however, for the process of adapting these metrics and measures to other universities within the state or elsewhere. As discussed previously, highly specific metrics developed in one place may be inapplicable to other local contexts due to the social, cultural, political, and biophysical factors affecting local food systems. Thus, because these values and metrics are less specific, they may be useful for other institutions to use as the basis for a values-based procurement program that can be adapted to their local context.

A university dining program, unlike K–12 schools, has profitability and consumer preference and satisfaction as administrative mandates for its operation. It is our hope that this framework, which deeply considers the complexity and competing values inherent in a university dining program can be helpful for other universities or entities that similarly have market- and consumer-based constraints and goals in their operations. In addition, while our framework can be adapted to different local contexts, some practitioners who are involved with IFP or community food systems development may choose to follow the methodology used in this study to develop their own set of values and metrics that are rooted in the social, cultural, political, and biophysical context of their institution and community. Future research to gain a deeper understanding of the findings of this study would be beneficial, including additional qualitative research to elicit feedback from panel members on the values and metrics related to their areas of expertise. A quantitative survey could be used to assess the student body's priorities for the values and metrics identified by the Delphi panel.

Conclusions

Because of its scale and buying power, a values-based IFP provides a great opportunity for creating food systems change. However, the principles and forces that govern most IFP programs make it difficult to adopt purchasing decisions that account for non-monetary values, and institutional inertia and a rigid policy environment can make it especially difficult to create change. While change is difficult, there is increasing awareness on the part of IFP operators of the importance of using institutional dollars to support the values the organizations claim to support. In addition, due to efforts of organizations like GFPP, RFC, Healthcare without Harm, and Menus of Change, consumers and institutions alike are not only aware of the ways in which their purchases affect farmworkers, local economies, the environment, health, nutrition, and more, but they are more cognizant of the opportunities for improvement and potential metrics to track their efforts and progress. Thus, the results of this study can be leveraged by Cooperative Extension and advocacy groups as a tool to educate institutions and help them to establish goals, priorities, and opportunities for their programs to support their customers, local communities, and food system.

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Appendix A. Core Values to Guide University Food and Beverage Services Programs

Excellence, Integrity, and Authenticity

- Adoption and emphasis on Key Performance Indicators (KPIs)
- Transparency: Generate publicly available reports for pledged metrics and benchmarks
- Oversight: Create advisory board to review program performance
- High customer satisfaction
- Increased customer access to product information
- Pleasant atmosphere for students, staff, and visitors
- High-quality, delicious, and satisfying food options
- High-quality service
- Food affordability for students and university community members
- Meal plan pricing at fair and competitive rate
- Economic viability of the program

Fairness, Justice, and Workforce

- Support food security and food access on campus
- Dignified, safe, and socially just working conditions for workers throughout the food supply chain (from farm to consumer)
- Competitive wage scale for employees
- Professional growth and advancement for workers
- Ensure safety of employees by adhering to established health and safety monitoring practices
- Increase permanent and full-time employment offerings
- Increase secure employment opportunities for students
- Support grievance filing and redressing protocols

Environmental Sustainability and Stewardship

- Reduce carbon footprint
- Reduce use of natural resources
- Reduce waste
- Increase purchases from vendors or producers using environmentally sustainable practices
- Increase purchases of environmentally sustainable products or foods
- Increase availability of sustainable menus and menu items
- Align with institutional sustainability goals
- Authentic marketing and communication about environmental sustainability

Local Economies

- Seasonal menus based on food availability in Florida
- Support small-scale and/or family or cooperatively owned farms
- Increase purchasing of Florida-grown food items
- Establish relationships with and collect input from local producers to identify and/or address salient challenges
- Support needed infrastructure for local procurement
- Reduce administrative burden for local farms and food businesses

Nutrition and Food Safety

- Contribute to overall health of students and customers
- Provide products of high nutritional quality
- Support diverse dietary patterns and consumer preferences
- Ensure food safety
- Increase nutrition awareness and knowledge

Continued

Continued

Culturally Diverse

- Adopt and strengthen Diversity, Equity, and Inclusion (DEI) protocols
- Support culturally sensitive food options
- Support culturally diverse workforce
- Increase sourcing from diverse vendors, farms, and food businesses including women- and minority-owned businesses

Community Connections and Partnership

- Align with institution's stated goals and values
- Serve the student community
- Support internal institutional partnerships with colleges, centers, and institutes
- Support local community (external to the institution)

Animal Welfare

- Support humane/cruelty-free offerings
- Increase purchases of products and from suppliers with third-party animal welfare certifications

Appendix B. Metrics and Measures to Assess a Values-based University Food and Beverage Services Program

Excellence, Integrity, and Authenticity

- Monitor total number of diners utilizing the program
- Monitor program revenue growth (e.g., growth in meal plans sold)
- Year-over-year increase in sales (in dollars) by location
- Monitor costs of meal plans and food options (as compared to peer institutions)
- Year-over-year increases in customer satisfaction as measured by standardized procedures

Fairness, Justice, and Workforce

- Monitor to ensure that program meets health department requirements
- Percentage of procurement dollars paid to producers (or paid on products) that meet third-party standards for fair labor practices
- Tracking number of worker safety incidents or non-compliance events
- Workforce pay/labor time monitoring
- Ensure that program meets Department of Labor requirements
- Collect employee feedback on worker satisfaction
- Establish a living wage benchmark for employees
- Provide worker benefits

Environmental Sustainability and Stewardship

- Year-over-year improvement in standardized sustainability metrics
- Percentage of waste avoidance (reduction in total waste)
- Monitor waste-to-purchase ratios
- Annual tracking of food waste (in lbs.)
- Annual carbon footprint report

Local Economies

- Percentage of menu items featuring in-season produce
- Track food miles (distance from vendor/producer to service destination)
- Measure and monitor local farm and food business purchasing for year-over-year increases
- Percentage of procurement dollars spent on Florida-grown products
- Percentage of procurement dollars spent on food produced from local farms
- Percentage of procurement dollars spent on products from local food businesses

Nutrition and Food Safety

- Track nutrition content of foods offered
- Percentage of menu items providing nutrition content information
- Percentage of procurement dollars spent on healthy, nutrient-dense foods
- Percentage of procurement dollars spent on fresh produce
- Conduct food safety monitoring
- Ensure all vendors comply with food safety standards

Culturally Diverse

- Establish goals for supervisor diversity to represent staff diversity
- Percentage of procurement dollars spent on purchases from minority-owned farms and food businesses
- Track the total number of minority-owned farms and food businesses from which the program sources products
- Number of food alternatives for cultural or religious food restrictions
- Number of food alternatives for voluntary diets or food restrictions

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Digging in: Toward a more just urban garden land policy

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Abstract

Surging interest in urban agriculture has prompted cities across North America to adopt policies that give gardeners access to publicly owned land. However, if not carefully designed, these policies can exacerbate existing racial inequities. Drawing on theories of urban and environmental justice, we use a contextualized case comparison to explore the radical potential and practical constraints of garden land policies at two distinct institutions: the City of Minneapolis and the independently elected Minneapolis Park and Recreation Board. Based on participant observation, document review, and interviews with a range of policy actors, we argue that what appear to be minor, common-sense policy details systematically shape who benefits from the garden land policies, sometimes in surprising ways. Compared to the City, the Park Board goes substantially further in addressing racial equity. Furthermore, though both cases included public participation, we argue that the more intensive participation during the Park Board policy development process—particularly in determining the details—was pivotal in crafting a policy that reduced barriers to racial equity. The present study contributes to the growing scholarship on urban agriculture and environmental governance and offers concrete insights for actors working toward more just policies.

Keywords

Urban Agriculture, Urban Land Access, Municipal Governance, Local Policy, Food Justice, Land Justice, Racial Equity, City Parks

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Introduction

In a park on the edge of downtown Minneapolis, college students and neighbors tend tomatoes and marigolds in raised beds built over an old horseshoe court (Figure 1). Across town to the north, sunflowers tower over rows of onions, squash vines, and collard greens on a lot left vacant after a devastating tornado in 2011. In South Minneapolis, nearly two dozen garden plots are squeezed into a narrow strip next to a fire station. While each site is unique, reflecting their caretakers' varied aspirations and labors, all three are among the City's hundred-plus gardens on public land made possible by recent policies.

In response to surging interest in urban agriculture, many cities across the country have developed policies that provide access to publicly owned land. Such policies are often touted as a way to address environmental injustice and racial equity, and indeed they can offer exciting possibilities for doing so in meaningful ways. However, supporters of urban agriculture come with a wide range of political commitments and goals—what geographer Nathan McClintock calls the "radical, reformist, and garden-variety neoliberal" (2014, p. 147) contradictions of urban agriculture—and, if not carefully crafted, land policies can end up exacerbating existing inequalities. With a vibrant and diverse urban agriculture movement (Homegrown Minneapolis, 2019a) and a reputation as a progressive bastion (Thompson, 2015), but with some of the most egregious racial inequalities in the country (Minnesota Compass, 2021c; Nickrand, 2015), Minneapolis is a particularly fitting place to dig into the messy details and muddy debates over justice in garden land policy.

Figure 1. Grape Tomato Vines Reach Skyward in a Raised Bed at a Community Garden in Loring Park

We present two case studies of the urban garden policies adopted by the City of Minneapolis and the Minneapolis Park and Recreation Board, a semiautonomous institution (hereafter referred to as the City and the Park Board, respectively). This study has two aims. First, we illustrate the ways in which seemingly minor, common-sense details systematically shaped who benefited from the garden land policies. Second, we highlight the key role of public participation—particularly during the stage where the details were determined—in crafting policies that reduce barriers to racial equity. Beyond the particularities of urban agriculture policies and of Minneapolis, the study offers concrete insights for scholars and practitioners working to develop more just policies and urban futures.

Literature Review

Justice Theory

Many scholars propose justice as a normative goal in urban policy and planning, though there remains debate on its meaning in practice (Agyeman, 2013; Davidoff, 2016; Fainstein, 2010; Fischer, 2009; Harvey, 1992; Krumholz, 1982; Marcuse et al., 2009; Steil, 2018). Drawing mainly on the work of planning scholars Agyeman (2013) and Fainstein (2010), and environmental justice scholar Schlosberg (2007), we take recognition, participation, and equity as distinct but interrelated elements that form a conceptual core in justice theory.

Recognition entails the respect for and meaningful consideration of social groups differentiated on multiple grounds of identity, such as class, race, ethnicity, national origin, gender, age, and ability (Young, 1997). Rather than seeking to homogenize or reduce intergroup differences, proponents of recognition envision a pluralistic urban space with policies that afford different treatment to social groups according to their needs or interests (Young, 1990). Adequate recognition provides standing for the participation and consideration of groups' distinct interests (Schlosberg, 2004). Burgeoning academic literature has foregrounded the particular salience of race in the production of spatial inequality—or the uneven distribution of resources, opportunities, and hazards across space—in the U.S., and its importance as an analytic approach in struggles for greater justice (Anderson, 2015; Goetz, Williams et al., 2020; Lee et al., 2021; Lipsitz, 2007; Pulido, 2017; Song, 2015; Williams, 2020).

Participation or procedural justice involves opportunities for laypeople to substantively influence policymaking (Fainstein, 2010). The essential questions for participation are "who is involved, how, and on whose terms" (S. White, 1996, p. 14). There is considerable variation in the stage of policy development where participation occurs (e.g., agenda setting, design, implementation), the required time commitment (e.g., a single event versus sustained engagement), barriers for laypeople to participate (e.g., meeting times, location, compensation, caretaking responsibilities), and the degree of influence laypeople have (e.g., token participation versus decision-making power). These factors are determined both by the state's willingness to share power and the ability of laypeople to mobilize to exert pressure (Cornwall, 2008). While participation is often conceptualized as a normative spectrum from manipulation to community self-determination (Arnstein, 2019; Pretty, 1995), ambiguity, contestation, and power asymmetries are inherent in any participatory process (Cornwall, 2008; S. White, 1996).

Equity is concerned with the fairness of policy outcomes—the distribution of goods, opportunities, burdens, and risks (Agyeman, 2013; Schlosberg, 2004). Under strict equality, benefits and burdens are divided equally among individuals. In contrast, *equity* recognizes that in practice individuals and groups begin from unequal positions, and that policies based on strict equality can uphold and even exacerbate existing injustice. Instead of distributing benefits equally without regard to present status, an equitable policy prioritizes the needs and desires of the people with the fewest resources and the least power (Fainstein, 2010; Krumholz, 1982).

Clearly, recognition, participation, and equity are enmeshed. Schlosberg (2007) explains: "it is not just that political and cultural institutions create conditions that hamper equity and recognition, but that both distributive inequity and misrecognition hamper real participation in political and cultural institutions" (p. 28). For Fainstein (2010) and Fraser (1995a, 1997), distributional justice ought to

be given the most weight, but Schlosberg (2007) argues that certain elements will assume greater salience in particular contexts or moments in history.

Urban Gardening and Justice

Urban gardening is often touted as a concrete manifestation of urban and food justice (Heynen et al., 2012), where equity, participation, and recognition can be integrated. Beyond its contribution to equity concerns, such as household food security (Meenar & Hoover, 2012), many proponents view urban gardens as a way to model alternative land governance arrangements that allow for and require greater participation, such as holding land in common (Aptekar, 2015; Eizenberg, 2012; Morrow & Martin, 2019; Schmelzkopf, 2002; Staeheli et al., 2002). Furthermore, scholars have documented urban garden projects that fostered greater participation and recognition by enabling grassroots political power, self-determination, and community empowerment (Irazábal & Punja, 2009; Saldivar-Tanaka & Krasny, 2004; Sbicca, 2019; Schmelzkopf, 1995; M. White, 2010, 2011). In terms of recognition, urban gardens serve as important sites of cultural reproduction, particularly for Indigenous, migrant, immigrant, and other communities for whom the gardens may have unique culinary, medicinal, and spiritual importance (Airriess & Clawson, 1994; Saldivar-Tanaka & Krasny, 2004). However, urban gardening does not inherently contribute to justice. Urban gardeners may be motivated solely by interest in fresher food or recreation rather than broader structural change (Horst et al., 2017; Lovell et al., 2014). Furthermore, even urban agriculture projects that espouse justice goals may reinforce racial inequalities in practice (Guthman, 2008; Kato, 2013; Passidomo, 2014; Reynolds, 2014; Safransky, 2017). Additionally, urban agriculture has long been entangled with the projects of settler colonialism and racial capitalism (McClintock, 2014, 2018). Despite these seeming contradictions, urban gardening and land access have repeatedly emerged as a central concern of justice movements precisely *because* land dispossession has been central to the oppression of low-income people and people of color (Gilbert & Williams, 2020; McClintock, 2018). In sum, while urban gardening on its own is limited in addressing the root causes of injustice (Agyeman, 2013; Alkon & Mares, 2012), nevertheless, it can make important material and symbolic contributions to broader efforts of low-income people and people of color to exercise greater power in the food system and in urban space (Block et al., 2012; Horst et al., 2017).

One key to fostering more just urban agriculture is stable, long-term land tenure, a common and persistent challenge for gardeners (Diaz et al., 2018; Lavallée-Picard, 2018; Vitiello & Wolf-Powers, 2014). It is difficult for urban gardens to compete with profit- or tax-generating land uses under urban governance regimes that prioritize the principle of highest-and-best-use (Vitiello, 2022). Prioritization of profit- and tax-generating potential pushes gardens onto economically marginal land; and, even then, access is often temporary in the face of changing property markets. Uncertain tenure has substantial socio-ecological consequences. It makes it less likely for gardeners to invest in practices with significant upfront costs but longer-term benefits such as soil health, perennial crops, and water infrastructure, to develop relationships with neighbors, and to foster broader social or political change. When a community garden is successful at providing benefits to a neighborhood but lacks stable tenure, it may even contribute to increases in surrounding property values, risking the displacement of the garden or the gardeners themselves (Glennie, 2020; Sbicca, 2019).

Many urban agriculturists have sought access to publicly owned land to avoid development pressures and secure long-term tenure. Given systemic racial disparities in wealth and land ownership, providing equitable land access is one way municipalities can foster a more just urban agriculture system (Desjardins et al., 2011; Horst et al., 2017; Thibert, 2012). However, municipalities must design such policies carefully to avoid reinforcing existing injustices (Cohen & Reynolds, 2014; Jerme & Wakefield, 2013). The emerging literature on urban agriculture policy underscores the need for a ground-level understanding of how policy actors grapple with this challenge. Through case studies of the City and the Park Board, we examine whether and how policy actors sought to integrate equity, participation, and recognition throughout the policymaking process and in the final policy

language itself. In both case studies, policy actors used "racial equity" as the dominant frame to articulate goals and formulate policy alternatives. The term foregrounds racialized groups and distributive justice as critical sites of analysis. However, it was often used more expansively to include questions of participation and recognition of multiple identity categories in addition to race, including physical ability, primary language, housing status, and immigration status. While we situate the case studies in the broader academic scholarship on justice, we primarily use the frame "racial equity" to acknowledge the intellectual contributions of the research participants.

Methods

We examine garden land access policies and policymaking by the City and the Park Board using a contextualized case study approach to examine similarities and foreground differences (Locke & Thelen, 1995; Simmons & Smith, 2017). This approach is apt for probing the ways the two institutions are shaped by similar social and political pressures that are mediated by distinct missions and cultures, bureaucratic structures, participation processes, and the particularities of the individuals involved (Locke & Thelen, 1995). Data collection included participant observation at Park Board and City council meetings, public planning meetings, and community group meetings from 2015 to 2019. In addition, in the fall of 2019 semi-structured interviews were conducted with 35 elected officials, staff, and community organizers and gardeners who participated in the policymaking processes, and we collected plans, reports, meeting minutes, and draft and final policies from public websites and at planning meetings. In analyzing the data, we employed a semi-open iterative coding strategy (M. Williams & Moser, 2019) to allow themes to emerge while keeping a keen eye on how seemingly minor details of policies and policymaking processes can influence racial equity.

Minneapolis Context

Straddling the Mississippi River in the upper U.S. Midwest, Minneapolis has a temperate climate with a growing season from about May through September (Minnesota Department of Natural Resources, 2021). The nationally recognized Park Board manages 6,800 acres (2,750 hectares) of parks, ornamental gardens, golf courses, and trails, accounting for 15% of the City land area (Minneapolis Park and Recreation Board, 2020; Trust for Public Land, 2020). In 2015, when data on vacant lots was last publicly available, the City was the single largest owner of vacant land, with more than 700 parcels primarily intended for future multifamily or business development (Shoquist, 2015).

Minneapolis has roughly 430,000 residents, of whom 37% are people of color (U.S. Census Bureau, 2021). Though the metropolitan region boasts high overall levels of educational attainment, median income, and homeownership, these aggregate measures mask deeply entrenched racial inequalities (Table 1; Minnesota Compass, 2021c, 2021d; Nickrand, 2015; Thompson, 2015). Public policies have inscribed these racial inequalities on the landscape. Racial covenants, redlining, interstate highway construction (often deliberately routed through Black and Brown communities, with racialized use of eminent domain), discriminatory siting of public housing, and other policies created distinct areas of poverty and affluence that closely correspond with racialized groups (Figure 2, Goetz, Damiano et al., 2020; Mapping Prejudice, 2021; Metropolitan Council, 2015; Nelson et al., 2020; Shelton, 2018). In the run-up to the 2007–2008 financial crisis, banks disproportionately targeted Black homeowners for subprime mortgages, deepening the racial homeownership gap and further concentrating vacant parcels in a handful of neighborhoods (Metropolitan Council, 2015). These broad contours of racial inequalities shape the landscape of possibilities for urban gardening.

Urban gardening has a long history in Minneapolis, punctuated by a few notable upswings in discursive and material support. For example, in the 1910s the Minneapolis Garden Club led a massive beautification campaign that eventually grew to encompass 400 acres. The social reformers who founded the garden club sought to reshape the physical and social landscape, and prominent real estate developers provided enthusiastic support—sometimes in combination with racial covenants—to boost property values (Walker et al., 2023). During the Great Depression, the Family Welfare

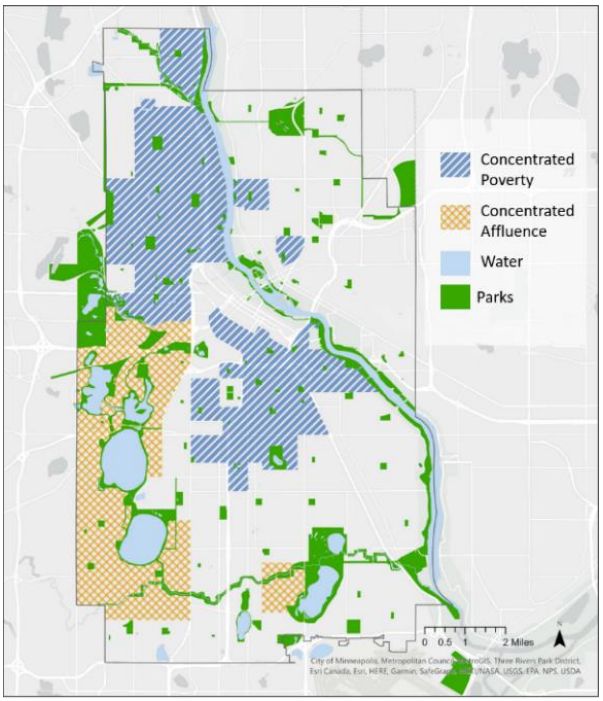
Table 1. Selected Measures of Racial Inequality in Education and Wealth in the Minneapolis–St. Paul Metropolitan Area (MSP)

		Metro-wide	White People	People of Color	Gap
Education					
High School On-Time Graduation	%	82.8	88.8	74.0	14.8
Bachelor's Degree (age 25+)	%	45.4	49.3	32.3	17.0
	(+/-)	(0.5)	(0.6)	(3.2)	
Wealth					
Median Income	$	84,000	90,500	59,000	31,500
	(+/-)	(1,646)	(2,105)	(4,157)	
Poverty	%	8.4	5.2	16.4	11.2
	(+/-)	(0.5)	(0.3)	(1.8)	
Homeownership	%	68.2	75.0	42.0	33.0
	(+/-)	(0.5)	(0.5)	(3.5)	

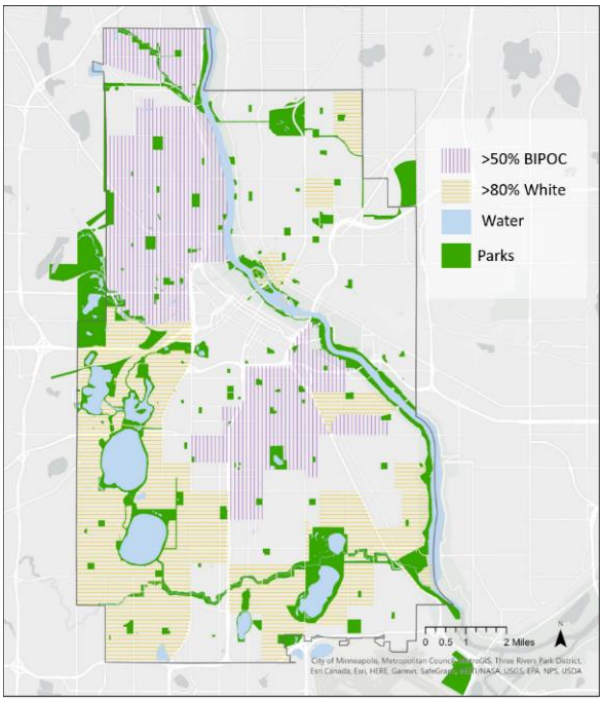
Source: Minnesota Compass, 2021d.

Figure 2. (a) Areas of Concentrated Poverty and Affluence (ACP and ACA), and (b) Areas of Racial Concentration

(a)



(b)



Note: ACP tracts >40% have a household income <185% federal poverty threshold. ACA tracts = estimated market value of owner-occupied homes (EMV)/region EMV >1.67 or % with income at least 500% of the federal poverty line(POV500)/region POV500 > 1.67 (Metropolitan Council, 2021). Definitions of racial concentration are drawn from Department of Housing and Urban Development (>50% Black, Indigenous, and people of color) and by Goetz et al. (2019) (>80% White).

Association managed a massive unemployment relief garden tended by hundreds of families (Salsberry, 1931). Local leaders also promoted patriotic gardening campaigns during both World War I and II (Pack, 1919; "Victory Garden Goals Doubled" 1943). Over the following decades, urban gardens attracted interest from apartment dwellers, counterculture hippies, and immigrant communities which included the growing number of Hmong refugees (Wascoe, 1981). By the 1990s, Minneapolis ranked second nationally in community gardens per capita (Lawson, 2005). By 2016, there were 295 community gardens and urban farms on public or private land in Minneapolis (Homegrown Minneapolis, 2017).

Around 2010, a loose coalition of gardeners and community organizers began advocating for better access to public land to grow food. Some gardeners had been able to access City or Park Board land for some years on an ad hoc basis, but access often hinged on well-resourced and well-connected individuals to champion the projects. Advocates hoped that formal policies would increase land availability and make the process more transparent and equitable. The Homegrown Minneapolis Food Council—an advisory group established in 2012 and made up of community members, City staff, and elected officials—served as the key forum for discussing land access policies (City of Minneapolis, 2011; Homegrown Minneapolis, 2019a), and the Park Board eventually created its own urban agriculture advisory committee a few years later.

Access to Public Land for Gardens in Minneapolis

We begin with a brief overview of each case and then examine the details of the respective policies and their implications for justice. While Table 2 summarizes key elements of the City and Park

Table 2. Key Elements of the City's Garden Lease Program and the Park Board's Community Gardens Policy

	City	Park Board
Land		
Eligibility criteria	Market-based	Neighbor interest & site conditions
How much	Varies. ~80-100 2020: 88 sites, ~10 ac (4 ha)	Growing. 2020: 8 sites, <1 ac (0.4 ha) Total of 17 sites planned.
Where	Clustered in low-income areas	More evenly distributed
Tenure	1-, 3-, 5-year leases w/ termination clause	Site tenure: indefinite; Individual tenure: no guarantee
Direct financial costs	~$600	$0
Fees	$51	—
Liability insurance	$400 (est.)	—
Water access	$150 (est.)	—
Infrastructure (Raised beds, fencing, pathways, etc.)	Gardeners provide	Park Board provides
Materials and tools (Seeds, plants, compost, woodchips, etc.)	Gardeners provide most	Park Board can often provide substantial aid
Site maintenance	Gardeners maintain entire site, year-round	Gardeners maintain garden plots during growing season
Application form(s)	Lengthy, complex, dense legal language	Short, simple, straightforward
Selection criteria	• Community garden > market garden • Proximity to garden site • Returning lessees > new applicants • Willingness to share lot • If all else equal, decided by lottery	• Minneapolis resident • Edible garden > ornamental • Connection to park • Lack of access to other garden space • If all else equal, decided by committee evaluation of open-ended responses

Board polices, we limit discussion to three illustrative examples: land availability, costs to gardeners, and application selection criteria. Throughout, we highlight the crucial dynamics of participation in each case and their impact on the final policy language.

Overview of City and Park Board Policies

The City's Garden Lease Program allows community and market gardeners to lease some vacant City-owned parcels (we focus in this study on community gardeners). It was launched in response to the 2009 Homegrown Minneapolis report, drawing from feedback from over 100 community groups, which identified land access as a top priority for strengthening the local food system (City of Minneapolis, 2009, 2010). The City acted quickly, launching a pilot program the following year with 21 parcels. In 2015, the City directed staff to draft a formal policy and the Land Access Committee of the food council provided comments and recommendations. By the end of the year, the City council had approved new parcel selection criteria, application requirements, and lease terms (City of Minneapolis, 2015a, 2015b). With these changes, the number of available lots shot up to over 100 but has fluctuated since (Homegrown Minneapolis, 2017, 2019b). The policy does not fit comfortably within a single department, requiring coordination between the Department of Community Planning and Economic Development (which owns most of the parcels and executes all leases), Public Works (which owns some of the largest parcels), the Sustainability Department (whose staff handle public outreach), and Homegrown Minneapolis (which makes policy recommendations).

The Park Board's community garden policy applies to gardens within parks, as well as a few scattered tax-forfeited parcels (we focus on the former). The Park Board policy development process began later and lasted substantially longer than that of the City. From initial community engagement in 2012, it was nearly eight years before the pilot program was launched, compared to a single year for the City (see Appendix A for a more detailed timeline). Staff presented a draft Urban Agriculture Activity Plan (UAAP) to the board of commissioners in early 2014. Public testimony convinced Commissioners to amend the final plan to include explicit racial equity goals and metrics (MPRB, 2014b, 2014c).[1]

By 2015, the UAAP Implementation Team—made up of staff and community members—convened to develop a garden policy. This allowed gardeners and community organizers to engage in long-term, intensive participation, not only debating overarching policy goals but also directly shaping granular policy details. Furthermore, several organizers brought their experiences with the City's policy to the Park Board and insisted on defining some implementation procedures. Previously, implementation procedures were set internally by staff, so allowing public input at this stage in the policy process was a major departure for the Park Board, an important point to which we will return. The 2019 season was a pilot program with four gardens tended by staff and volunteers. By 2021, the policy was in full swing, with eight community gardens and plans to add nine more over time. Similar to the City policy, the Park Board requires substantial collaboration between departments, including Planning, Environmental Stewardship, Asset Management, and Recreation, which are responsible for policy development and funding, staffing, maintenance, and on-site oversight, respectively.

Land: How Much, Where, and for How Long?

The two institutions differ substantially in how they determine what land is available for gardening, with important implications for justice. The City primarily bases its decision on a parcel's lack of development potential while the Park Board primarily decides based on neighborhood interest, site conditions, and funding availability. This difference is in part a result of the distinct missions, cultures, and political leanings of the institutions, but perhaps more importantly because of the underlying legal

[1] Among 38 people who provided comments, 23 urged the Park Board to delay adoption until racial equity was incorporated while nine urged adoption as written. Of the remaining commenters, only two expressed concern about gardens.

structures that constrain what the City and Park Board may do with land they own.

When the City department of Community Planning and Economic Development (CPED) acquires a parcel, typically it "seeks to quickly return the property to a tax-generating use" (Berkholz, 2009, p. 10) and has often acquired the parcel from the state or county on the condition that it is returned to private ownership. Thus, CPED offers only lots that are undevelopable, undersized, or that "pose marketing challenges" through the Garden Lease Program (City of Minneapolis, 2015a, p. 1). Using lack of development potential as the guiding criteria led to several challenges. First, the selection process does not consider suitability for gardening. A 2016 volunteer assessment found that nearly a quarter of available lots had deep shade, no water access, or other challenges. Unsurprisingly, nearly all of these challenging parcels remained unleased. Second, in the context of racialized spatial inequality, the use of market-based criteria led to a clustering of available lots in neighborhoods with some of the highest proportions of people of color and people in poverty (Figures 2 and 3; Minnesota Compass, 2021a, 2021b). This distribution could potentially expand gardening opportunities for residents of these neighborhoods, but proximity is not the same as genuine access. Other aspects of the policy—such as costs, complex requirements, and others discussed below—can make it disproportionately difficult for low-income people and people of color to participate in the program even when there are eligible lots nearby. Third, there was a spatial mismatch between available lots and demand for garden lots. Several parcels in South Minneapolis received multiple applications, while some suitable parcels in other parts of the City received none. Fourth, availability of lots is tied closely to shifting market conditions. From 2016 to 2020, the number of lots available ranged from 80 to 100. City staff predicted that 25% of garden lots could be developed from 2020 to 2025.

Furthermore, land tenure is largely short-term and tenuous. The City offers leases that last one, three, or five years, but can terminate leases at the end of any growing season, which leaves gardens on CPED-owned parcels especially vulnerable to shifts in property markets. (The few eligible parcels owned by Public Works are typically held permanently, but gardens may be displaced by other departmental mandates such as infrastructure maintenance.) Indeed, even when the total number of lots has remained stable, there has been substantial turnover in the particular lots available through the Garden Lease Program. When selling a parcel before the lease term, the City sometimes offers displaced gardeners an alternative site. However, gardeners asserted that this does not adequately account for the loss. They cannot transfer their investments in soil health or relationships with neighbors to a new site. Garden sites are not fungible.

The Park Board's mission and enabling legislation provide it with much wider leeway to acquire and hold land for public use in perpetuity. For gardens on existing parkland, rather than competing with the exchange values of land, gardening is largely weighed against other recreational uses. (The Park Board does hold some tax-forfeited parcels for community gardens, but this is relatively rare.) Potential garden sites are identified through the park master planning process, based primarily on interest from neighborhood residents and site characteristics. These factors avoid several concerns about spatial distribution, site quality, and tenure involved in the City's policy. However, the Park Board policy poses other challenges related to the amount of land available, engagement of under-resourced groups, and tenure for individual gardeners. First, in terms of land availability, demand for garden plots far outstripped supply. In 2020, there were 130 plots across eight garden sites, but the Park Board received twice that number of applications. Nine additional park sites are planned, but it will take several years to build them. As to where land is available, the Park Board's garden sites are distributed more evenly than the City's (Figure 3). Second, gauging community interest through the master planning process is undoubtedly a positive step toward matching demand for garden space with access to land. However, the Park Board faces common challenges in engaging underrepresented groups, such as non-native English speakers and low-income people. Third, under the Park Board's policy, *garden site* tenure is assured, but advocates were split on whether an *individual gardener's plot* tenure should be guaranteed year-to-year. Some saw

long-term tenure for individuals as the foundation of responsible soil management practices and lasting social bonds. Others were concerned that guaranteeing the same plot year-to-year could lock out newcomers and over time disproportionately favor white, well-off residents. This second faction proposed giving no preference for returning gardeners; eventually, the implementation team and Park Board staff settled on this approach, which means that there is no guarantee an individual gardener will have a plot from season to season.

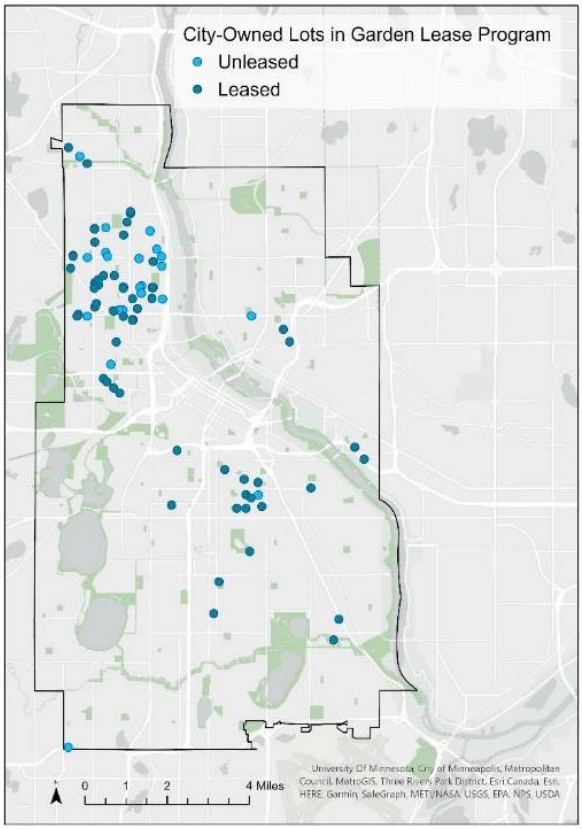
Costs: What Are Gardeners' Responsibilities?

Costs for gardeners to access land through these policies can create barriers that exacerbate race- and class-based disparities. As such, they reflect an institution's (un)willingness to commit resources to reduce systemic barriers. Overall, the City's policy involves higher financial, in-kind, and labor costs for gardeners than the Park Board's policy.

Under the City's final policy, leasing a typical garden site involves roughly $600 in direct costs before the season begins. This includes $51 in administrative and annual lease fees.[2] The City also requires gardeners to carry a US$1 million liability insurance policy, which costs roughly US$400 per year (A. Diamond, personal communication, 2021).[3] Once a parcel is leased, gardeners incur

Figure 3. (a) City-Owned Lots Available Through the Garden Lease Program are Largely Clustered in North Minneapolis; (b) Park Board-Owned Sites for Community Garden and Urban Agriculture—Existing and Planned—are More Evenly Distributed

(a)



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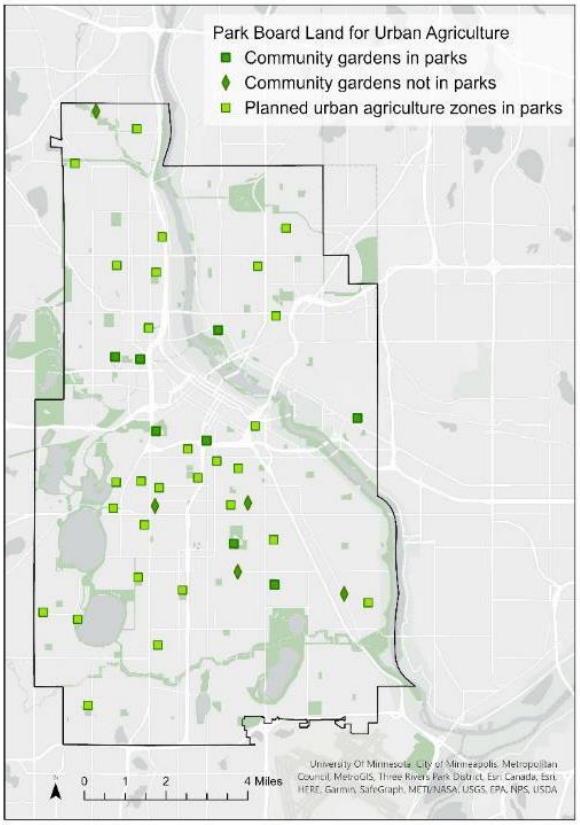

[2] Initially, the City also recommended a refundable $250 damage deposit. Public comments and a formal recommendation from Homegrown forcefully argued that the additional cost represented a substantial financial barrier. Instead, the City agreed to charge gardeners if parcels required grass reseeding when the lease expired.

[3] The Homegrown Council and community members objected to the insurance requirement because of the high cost burden, but a powerful council member insisted that it was necessary to protect the City risk.

additional costs for access to water from a public fire hydrant (a US$150 upfront cost, plus metering) or they may reach a private agreement with neighbors to access water. Gardeners also assume costs for plants, soil amendments, tools, and temporary infrastructure such as raised beds, fencing, and pathways. However, Homegrown staff are often able to coordinate deliveries of free or low-cost compost and recruit outside partners to offer free seeds.

Regarding labor, the City lease agreement requires gardeners to mow all lawn areas in the summer and clear snowy sidewalks in the winter. Many community members objected to this requirement because it involves costly equipment and additional labor, some occurring outside the growing season, that is not directly related to gardening. However, by shifting maintenance to gardeners the City saved an estimated $3,600 per leased parcel, precisely what made the policy attractive to some elected officials. One council member stated, "In terms of all the other good stuff with regards to healthy foods and all that, that's great and all. For me, the important part of this is save [the City] money" (Minneapolis City Council, 2015). This provision prioritizes cuts in municipal spending over reducing financial barriers to land access.

The Park Board policy involves no fees or liability insurance, reducing upfront financial costs to gardeners by hundreds of dollars compared to the City policy. This was primarily a result of insistence by organizers on the implementation team. Many gardeners lauded this as making the policy more equitable, though some staff suggested a modest fee (e.g., US$10) to ensure greater follow-through among participants, a tactic that had increased attendance for other space-limited programming.

Another major point of contention arose around funding for garden construction. Initially, the Park Board followed the City in making gardeners responsible for the labor and costs of creating the gardens, while many community organizers and some staff advocated for more funding, especially for expensive infrastructure such as accessible paths and water access. The Park Board was reluctant to commit additional funds until an internal vetting process revealed that the Park Board's existing liability insurance would only cover employees or contractors engaged in construction, but not garden volunteers. In the end, the Park Board agreed to fully fund garden construction, allocating US$75,000 per year. By covering construction and liability insurance, the Park Board dramatically decreased direct costs to gardeners compared to the City policy. However, it also limits how quickly the program can grow under current budget allocations. For reference, a single water line costs roughly US$30,000, 40% of the annual budget allocation for gardens. Furthermore, it gives the Park Board more power in determining the design and layout for gardens, whereas gardeners have considerably more freedom under the City's policy.

Regarding other costs, similar to City policy gardeners provide most plants, tools, and other materials. However, the Park Board is often able to offer a selection of transplants from their own greenhouses or suppliers. Unlike the City, the Park Board policy does not require gardeners to invest in any maintenance beyond their garden plots.

Application Selection: Who Can Garden?

The application process determines who can access the benefits of the policy, which is fundamental to questions of equity and recognition. Under the City's policy, applications typically represent a group of gardeners—which may be organized formally through a neighborhood organization or church, or informally as a few neighbors interested in gardening together—whereas under the Park Board's policy applicants are typically individual gardeners. While the policies are not precisely analogous, comparing the application processes is still helpful for interpreting the intended beneficiaries and potential barriers.

The application for the City's program is a multi-step process, includes dense legal language, and requires a fiscal sponsor as well as proof of insurance. Organizers report that the process is especially challenging for gardeners with limited English proficiency, or limited knowledge of, trust in, or time to navigate City bureaucracy. Staff eventually developed a helpful 26-page handbook for prospective gardeners; while the handbook is clear and well-designed, the fact that it is necessary underscores the complexity of the process.

At first, the City did not clearly define how staff would select prospective lessees when multiple garden groups applied for the same lot. Despite well-intentioned staff, the lack of clarity allowed room for doubt to grow among gardeners, leading to distrust and accusations that the process was inequitable. Now the Garden Lease Program materials explicitly list four criteria staff use to select applicants. First, community gardens receive priority over market gardens. Proximity is also considered: garden organizers who live closest to the desired lot receive priority. Garden groups with existing leases receive priority over new applicants. Fourth, if multiple applicants for the same parcel meet all the above criteria, applicants who are willing to share the lot receive priority. If no party wishes to share it, the lease is awarded by lottery.

For the Park Board, staff initially considered applicant selection as a *procedure* to be determined internally without public consultation, similar to City policy. However, community organizers on the implementation team continually pressed to expand the scope of their work to include application selection procedures, and the Park Board eventually assented. The implementation team quickly rejected a first-come, first-served approach over concerns that it would favor people most likely to hear about the opportunity through the Park Board's website and email lists, which according to the Park Board's own analysis skewed whiter and wealthier. The implementation team also considered a lottery approach where any on-time application would have an equal chance of being selected—the same process used to grant use of many other park amenities (e.g., berths in canoe storage racks). Community organizers viewed this approach as formally *equal* but not *equitable*; that is, it did nothing to affirmatively address inequalities.

Instead, advocates proposed using criteria to rank applications. The first three were uncontroversial, giving preference to applicants who (1) are Minneapolis residents, (2) plan to grow food rather than ornamentals, and (3) have a connection to the site (e.g., proximity to home, school, or work).[4] Defining a criterion to address racial equity was a much thornier question. Advocates initially discussed criteria such as income, race/ethnicity, homeownership, and citizenship status, but these posed a number of challenges. First, it was impossible to agree on their relative importance. In addition, the Park Board's legal counsel warned that considering race in the provision of benefits would risk violating the constitution. Furthermore, many advocates worried that such detailed questions could feel invasive, stigmatizing, and potentially threatening, particularly for undocumented immigrants. Instead, the implementation team eventually settled on a criterion that prioritized applicants who do not otherwise have access to garden space. This decision passed legal muster and many advocates felt it to be a reasonable—if imprecise—proxy for disproportionately low rates of land ownership among low-income people and people of color. If necessary, based on the number of applicants and plots available, a committee of staff and community members then considers open-ended questions, such as why the applicant wishes to garden. Compared to the City's application, the Park Board's application is quite simple, consisting of a handful of questions that fit on a single page.

In summary, regarding recognition and equity, advocates at the City and the Park Board continually sought to center the needs and wishes of gardeners who are low-income or people of color in determining the details of the policies. This approach included arguing for more land, secure and long-term tenure, lower costs, equity-informed applicant selection, and other terms intended to reduce barriers to land access. Many staff and elected officials at both institutions also voiced support for these goals. However, at the City, although community members helped get the policy on the agenda, they were primarily limited to an advisory role; decisions about specific policy details and procedures remained internal to City staff and council members. Furthermore, even if elected officials had evinced a greater willingness to protect land permanently for urban agricultural use, it would have required establishing new legal structures to do so. Ultimately, the City took relatively small

[4] This was designed to be more inclusive than proximity to home address by accounting for other place-based connections and avoiding exclusion of people without stable housing.

steps, such as reducing some fees and lengthening some lease terms, to address community member concerns.

In contrast, at the Park Board's implementation team, community members participated directly in setting the policy terms, though the process was more protracted and openly contentious at times. The result was a Park Board policy that goes much further: it attempts to match land availability with community interest, funds garden construction, has a short and simple application, and includes selection criteria that aim to address inequality in land access. Indeed, a Park Board planner proudly described the final policy as "a collective vision" that "reflects community voice." Community participants were less effusive but still positive; one stated, "This is a huge thing for the Park Board to do, but it's not happening out of the goodness of their heart. It took a lot of pushing, a lot of training…It is not perfect but it's way better than a lot of the outcomes we've seen previously." The policy cases illustrate both the surprisingly large influence that seemingly minor details can have on racial equity and the ways public participation, particularly at the stage where policy details and procedures are set, can contribute to more equitable policy.

Discussion and Conclusion

Drawing on theories from urban planning and environmental justice, this paper explores the radical possibilities, thorny tradeoffs, and contentious disputes involved in providing access to public land for gardening. Urban agriculture is often imbued with a taken-for-granted goodness in policy discussions, which can serve to gloss over questions of power and justice. A close examination of the policy development process and the policy details helps to re-politicize the policy, revealing the underlying agendas that are ultimately served (Hammelman, 2019; Swyngedouw, 2015). In these cases, the details of the City's policy reveal an emphasis on cutting costs, preserving the ability to sell parcels for development, and a reluctance to commit substantial resources to reducing barriers to garden land access. What Schmelzkopf (2002) describes as the "hegemonic project of the government to maximize exchange values" (p. 323) is visible both in the political attitudes of key City council members and the deeper structures that constrain City policymaking. In contrast, the Park Board's statutory authority includes permanently holding land for public use, loosening the grip of the otherwise dominant market logic. Ultimately, the City policy suggests a view of gardening as marginal to its core functions, while the Park Board policy views gardening as squarely within its scope.

A justice lens highlights how concrete policy details distribute benefits and burdens, the degree of public participation, and the social groups that may be (mis)recognized. Practitioners—elected officials, staff, gardeners, and community organizers—involved in garden land policies can incorporate equity concerns by carefully considering access and barriers to long-term tenure including not only proximity, but also the complexity of the application process, fees, and other requirements. Practitioners must also take into account the distribution patterns of soil and air pollution, as well as access to other resources necessary for growing food, such as water, compost, soil testing, and raised beds. As the present cases illustrate, substantive participation by gardeners is essential. There should be opportunities to meaningfully shape land access policies at all stages, from goal setting through evaluation, as well as to determine garden sites (at all stages, from design through day-to-day maintenance). Based on my findings, we contend that participation processes for urban garden policies should also be sensitive to potential variation in availability of participants with respect to the local growing season. We argue that addressing recognition requires leeway for a wide range of gardening practices, aesthetics, cultural meanings, and ways of relating to other-than-human species. Furthermore, recognition requires accounting for historical and ongoing traumas experienced by many in terms of land, agriculture, and food, including land dispossession, enslavement, forced migration, and labor exploitation. Policies should include provisions for redress and repair. Finally, the present study illustrates the value of attending to the ways in which equity, recognition, and participation are linked. Rather than arguing over the relative importance of recognition versus distributive concerns (Young, 1997; Fainstein & Fainstein,

2013; Fraser, 1995b, 1997) or of participation and the discursive turn (Fischer, 2009), these elements were tightly bound in both policy cases.

While much of the scholarly literature emphasizes the role of public engagement in defining broad goals and shaping the policy agenda, the present case comparison illustrates the importance of public participation throughout the policy development process, including during the implementation and evaluation stages (Bryson et al., 2012; Cooper et al., 2006). At the City, Homegrown Minneapolis members facilitated a community evaluation process to formulate recommendations presented to the City council, some of which were eventually adopted. At the Park Board, advocates worked to expand their scope of influence to include setting some implementation and evaluation procedures. The role of participation in the City and Park Board cases reflects the insights of Majone and Wildavsky (1995) about the contingent nature of policy and the power that lies in implementation:

> If problems are best understood through solutions, then implementation includes not only finding answers, but also framing questions. Reformulating problems means changing solutions. Policy ideas in the abstract … are subject to an infinite variety of contingencies, and they contain worlds of possible practical applications. (p. 149)

In spelling out Park Board procedures, advocates sought to protect their vision of the policy's intent by laying out terms and procedures in much greater detail than is typically done, thus narrowing the space for staff to impose their own interpretations of what the policy should be. In conducting an independent policy evaluation, advocates sought to assert their own benchmarks of success and underlying visions for the policy. We do not wish to over-romanticize participation or to argue that more participation is always better. These cases highlight many of the complexities, nuances, and difficult tradeoffs involved in participatory policymaking that other scholars have identified (Bryson et al., 2012; Slotterback & Lauria, 2019). Through the act of gardening, community members already participate directly in the practice and implementation of any land access policy, and gardeners may not have an interest in other stages of the policy process or be able to afford an investment of unpaid time. In the present study, most advocates who could sustain engagement with the policy process over the long term were community organizers with paid positions at nonprofits. On one hand, this reduced the burden of unpaid labor for community members. On the other hand, the organizers were largely white and well-educated, raising questions about the representativeness of participants, which is a challenge for any uncompensated public engagement process.

The study has several limitations. First, these cases represent only one particular period in time. My fieldwork ended in the fall of 2019, the pilot year of the Park Board policy, do the case study does not cover policy implementation. Second, data collection ended before the COVID-19 pandemic and the attendant economic instability, as well as before the uprisings following the police murder of George Floyd. Nevertheless, the present study provides a window onto one strand of racial justice activism and policy work preceding these multiple overlapping crises. Future research should explore the influence of these dynamics on urban agriculture land access policies.

Urban garden projects can advance social justice (Irazábal & Punja, 2009; Saldivar-Tanaka & Krasny, 2004; M. White, 2011) but can also exacerbate existing injustice (Guthman, 2008; Kato, 2013; Reynolds, 2014; Safransky, 2017). If protecting public land for gardening is to contribute to a more just urban agriculture system, we must attend to *how* land is protected and *who* has the power to make such decisions. This study contributes a rich ground-level examination of policy language and development processes to the growing scholarship interrogating the role of urban planning and policy in supporting urban agriculture (Cohen & Reynolds, 2014; Halvey et al., 2021; Hammelman, 2019; Horst et al., 2017; Jerme & Wakefield, 2013; Meenar et al., 2017; Pothukuchi, 2015; Thibert, 2012). The goal of increasing public land for gardening attracted support from policy actors with quite different underlying values and purposes in mind. During the policy development process, contentious debates over policy details laid bare

tensions among these underlying values and whose agendas would ultimately win out. This case study comparison illustrates how what would appear to be minor details can uphold or undermine racial inequality. Policies must be deliberately designed to reduce structural barriers and ensure that benefits flow to the most marginalized communities. The best chance of doing so comes from the meaningful participation of gardeners from such communities throughout the policy process.

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Appendix. Timeline of Land Access Policies at the City of Minneapolis and the Minneapolis Park and Recreation Board

City		Park Board
Homegrown established as a temporary initiative	**2008**	
Report identifies land access as key priority based on engagement with 100+ community groups	**2009**	
Pilot garden program makes 21 lots available	**2010**	
	2011	Internal committee formed to oversee the development of an urban agriculture plan
Urban Agriculture Plan is approved, which formalizes the Homegrown Food Policy Council. It also eases several zoning restrictions on urban agriculture.	**2012**	Public engagement through events, surveys, and meetings collected feedback from 1,000+ people
	2013	
	2014	Adoption of the draft Urban Agriculture Activity Plan (UAAP) is delayed until stronger racial equity language could be added
47 lots available **Formal Garden Lease Program is approved** with changes to eligibility criteria, fees, leases	**2015**	
85 lots available, but 29 remain unleased (assessment finds that 30 have major challenges)	**2016**	UAAP Implementation Team drafts policy and collects public feedback
	2017	
80-100 lots available each year, <10 ac (4 ha) but 20-35 remain unleased (likely because of unfavorable growing conditions)	**2018**	Community Gardens Policy is approved
	2019	**Pilot program begins** (mostly as demonstration)
	2020	4 sites, <0.5 ac (<0.2 ha)
	2021	8 sites, <1 ac (<0.4 ha)

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Engaging, empowering, and evaluating farm-to-school projects with photovoice

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Abstract

This case study describes how we used photovoice as an engagement, empowerment, and evaluation tool in a farm-to-school project with food service staff in rural Ohio. We explain why we chose the visual narrative approach, working in a school setting, addressing institutional review board protocols, training, building trust with participants, and the outcomes. We provide lessons learned and suggestions for how other farm-to-school projects can use this tool for broader engagement, empowerment, and evaluation, especially when working with hard-to-reach or vulnerable populations.

Keywords

Farm-to-School, F2S, Photovoice, Evaluation, Food Service Staff, Empowerment

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Introduction

The farm-to-school (F2S) movement encompasses a diverse set of projects, goals, and approaches. However, fundamentally, most projects involve the integration of local food into school meals. F2S research and best practices literature examining project implementation, engagement, and evaluation tends to focus on farmers, food service directors, and students (Conner et al., 2011a; Conner et al., 2011b; Janssen, 2014; Prescott et al., 2020; Roche et al., 2015; Taylor & Johnson, 2013; Vogt & Kaiser, 2008;). Little research or evaluation has been done on the lived experiences of the food service staff who actually carry out the F2S cafeteria initiatives, which are critical to long term success and project sustainability (Izumi et al., 2010; Stokes & Arendt, 2017). While surveys and assessments can determine if learning objectives have been met (Caffarella & Daffron, 2013), they are an extractive form of data collection, especially when used with vulnerable populations such as food service staff. As an alternative to conventional quantitative and qualitative data collection techniques, photovoice has become a popular and effective tool for engagement, empowerment, and evaluation in active research, extension, community, and economic development, and is an effective strategy for expanding the ways in which professionals can better connect with their communities (Budig et al., 2018; Keller & Mott, 2020). However, using photovoice in schools where minors are present can present unique challenges. In this case study, we provide an overview of how we used photovoice as a community-based participatory research, engagement, and evaluation tool in a F2S project with food service staff in two school districts in a rural Ohio county.

Setting the Stage: Objectives of the Wayne County, Farm to School Project

Wayne County is a rural agricultural county in northeast Ohio with 116,038 residents. While FFA and 4-H are active in the county, there had been no formally coordinated F2S programing until 2018. The "Cultivating a Farm-to-School Community in Wayne County, Ohio" initiative was designed as a holistic project built around local food purchasing, nutrition education, and rural economic development, and providing new partnerships between schools, farms, local non-profits, Ohio State University (OSU) Wayne County Extension, and OSU's College of Food, Agriculture, and Environmental Sciences Wooster campus, which houses both the Ohio Agriculture Research and Development Center (OARDC) and OSU's Agriculture Technical Institute (ATI).

Agriculturally rich, Wayne County ranks third in the state for total value of agricultural products sold and ranks in the top ten for production of fruits and berries, cattle and calves, milk, and poultry and eggs (U.S. Department of Agriculture, National Agriculture Statistics Service [USDA NASS], 2017). Wayne and neighboring Holmes County are home to one of the largest Amish settlements in the country; two Amish produce auctions aggregate fresh high-quality produce in bulk for buyers throughout the state from April through November. While agriculture is the backbone of Wayne County's economy, many members of the community face high rates of food insecurity and obesity. Wayne County's youth obesity rates are higher than the state averages. Additionally, the county has an overall child food insecurity rate of 22.6%, and food insecurity was ranked as one of the top four areas of concern in the 2014 Wayne County Community Health Assessment (Wayne County Health Department, 2014). This project worked with two school districts, and four schools within them, with the highest poverty and highest free and reduced meal rates in the county. The schools participating in the project had a total of 2,181 students enrolled and have free and reduced meal rates ranging between 45.8% to 75.5%

The collaborating faculty, extension educators, nonprofits, and schools provided topical and scholarly expertise on F2S, community and economic development, rural sociology, social work, agriculture communication, family and consumer sciences, Supplemental Nutrition Assistance Program (SNAP) education, sustainable agriculture, and soil science. Funded through a U.S. Department of Agriculture Farm to School Grant and an OSU Connect and Collaborate Grant, the goals of the project involved each school developing an individualized farm-to-school plan and

increasing the variety of local fruits and vegetables in school meals.

Early on, the team recognized that the majority of food service staff do not have a culinary background and are unsure of how to prepare fresh fruits and vegetables into meals that children will eat. Part of the grant funding supported repeated hands-on training for food service staff. In this paper, we describe how we used photovoice to engage and empower food service staff, while also evaluating their experience and satisfaction with knife training workshops, local produce quality, introduction to new recipes, meal preparation, and overall project activities. This project was intended to last 20 months between 2019 and 2021, however the project was cut short due to COVID-19 in March of 2020, and the final community photo exhibit scheduled for spring 2020 did not occur. We describe all activities leading up to the cancelled event.

Why Use Photovoice as a Tool for Engaging with Food Service Staff?

There is little research or evaluation of the lived experience of food service staff who implement the F2S cafeteria initiatives that are critical to long term success and project sustainability (Izumi et al., 2010; Stokes & Arendt, 2017). The structure of school food service positions can create a stress point that fractures and limits F2S initiatives. Many school districts' food service staff, not including food service directors, are outsourced, work part-time hours, are paid low wages ranging from US$4 to US$6 an hour less than those employed directly by the school district, and rarely receive benefits like paid sick leave or health insurance (Jacobs & Graham-Squire, 2010). Additionally, food service staff have relatively little power or authority and are often excluded from decisions that impact their work (Stokes & Arendt, 2017). Recognizing these structural conditions, we chose photovoice because of its function as a tool for empowerment (Budig et al., 2018; Bugos et al., 2014) and as a tool to tangibly connect food service staff to the project, amplify their experiences, and provide them with a voice and ownership over the project.

Photovoice is a participatory and emancipatory visual narrative approach wherein participants themselves both illuminate and work to solve aspects of their lives and challenges that are generally ignored by society and literature (Sutton-Brown, 2014; Wang & Burris, 1997). As such, photovoice provides opportunities to broaden food systems and farm-to-school projects by asking food service staff to tell us about their realities; giving these individuals a space to interact and reflect with peers in similar situations and involving them as active developers of recommendations both realistic and acceptable to them.

There already exists extensive guidance on photovoice, including step-by-step planning of a photovoice activity, debriefing picture taking, ensuring participants' privacy and physical safety, and ensuring photo rights (Evans et al., 2022; Jongeling et al., 2016; Wang & Redwood-Jones, 2001). Still, scholars have noted that practical guidance is needed to help researchers develop a photovoice project, particularly to allow researchers' adherence with the principles of both photovoice and human subject reviews (Lenette et al., 2018; Teti, 2019; Yanar et al., 2016; Becot et al., 2023). Furthermore, every photovoice project generates a unique set of situational ethical and methodological dilemmas for both the participants and those initiating the activity (Lenette et al., 2018; McDonald & Capous-Desyllas, 2021).

In photovoice, participants perform the role of researchers and knowledge creators by taking pictures and debriefing them. Participants then often take on the role of educators and advocates by curating a photography exhibit targeted at their communities and decision makers, calling attention to their realities and asking for solutions (Sutton-Brown, 2014; Wang & Burris, 1997). Despite the broad appeal among academics and community-based organizations, both logistics and navigating risks to participants can make photovoice challenging to implement. In turn, these limitations can inhibit the emancipatory nature of photovoice. Unique considerations associated with picture taking and sharing must be made. Organizers of a photovoice project need to consider, among many things, the safety of participants when taking pictures, the consent process to take pictures of other people, especially if minors are involved; picture rights and ownership; and possible negative judg-

ments made about participants or their community (Sutton-Brown, 2014; Becot et al. 2023). In designing and implementing this project, we found that there are unique challenges particular to the school setting, where minors are present, that are not described in existing published photovoice resources. We present how we used photovoice as a tool for engagement, empowerment, and evaluation in a vulnerable school setting.

Training and Implementing Photovoice with School Food Service Staff

Prior to launching the project in fall of 2019, we worked with school administrators to hold a spot on the agenda for their summer, district wide, professional development day that would introduce the project to all food service staff. During the morning portion of the meeting, we introduced the project, explained Institutional Review Board (IRB) protocols, and practiced photography through an active learning approach. In the afternoon, staff attended the first cooking professional development workshop. By utilizing a pre-scheduled meeting day and time, we were able to overcome travel barriers and ensure that staff were compensated for their time.

To reduce any anxiety associated with photography, we recruited a photographer from OSU's communications department to assist with the training and group discussion of ethical photography guidelines. We ensured there was ample time for all staff to practice handling the cameras, taking pictures, and downloading them. As a group, we discussed the angles, emotions, and stories each picture told. Having a professional photographer not formally affiliated with the project emphasized this as a professional development activity and increased the fun factor associated with the training.

To engage staff and evaluate the project, we asked food service staff to take pictures of their work preparing, cooking, and serving food related to the F2S project, and requested that they include photos of both the joys and the challenges associated with the F2S activities they were a part of. We met with each school's food service staff once a month for approximately 30 minutes during the workday to review photographs and interview the staff as a group. We visited the school a few days before the meetings to transfer photos from the school's camera to a secure online storage folder and printed the photos for the meeting. We provided each cafeteria with a notebook for staff to record notes and individual reflections. When unable to acquire photos before meetings, photos were downloaded and reviewed via laptop. Staff shared their perspectives and titles for each photo during interviews.

Ethical Photography Guidelines in a School Setting

The literature on photovoice provides varying guidance on exactly what type of camera to use, and many refer to participants using personal cell phones (Bugos et al., 2014; Jongeling et al., 2016). Reflecting on the ease of photo-sharing through cell phones via texts, emails, and social media, we quickly realized IRB confidentiality protocols could not be ensured. To alleviate this issue, we purchased point-and-shoot digital cameras that were easy to use, durable, and water resistant to withstand the school kitchen environment. The cameras were approximately US$130, available through big-box stores, and were tagged with university labels.

Bugos et al. (2014) emphasize the importance of photovoice training to include project and population-specific strategies that assist participants in navigating the ethical challenges of taking photos of others. Given the focus of our project, we instructed staff to only take pictures of F2S participants over the age of 18 who agreed to be photographed and only of the body parts they agreed to be photographed. All photos needed to be taken on OSU digital cameras. Participants were provided copies of their digital photos on request.

Most significantly, we co-created guidelines for ethical photography within each school kitchen. This process empowered the staff to help set the ground rules for how and when to take pictures, each staff member's comfort level with having their photo taken, and how we debrief about the pictures (e.g., individually or as a group). This approach helped to create a shared sense of ownership of the project. We describe our protocols and include samples of our Approved Human Subject Informed Consent that can be adapted for other projects in the Appendix.

Engagement

As an engagement tool, photovoice allows community members to take on the role of researcher and knowledge creator (Glaw et al., 2017). To minimize anxiety and increase engagement, we asked the same questions for each photograph and printed the list of questions for reference. Specifically, we asked participants to tell us: What is happening in this photo? Why did you take a photo of this? What does this photo tell us about your life and work? How can this photo provide opportunities for us to improve the farm to school project? How would you caption this photo?

Initially, participants were hesitant to share their interpretation and meaning behind each photo and would ask us what we saw. To connect with participants, the lead researcher drew on her experience as a line cook to describe how she saw "uniformly hand diced vegetables" along with observations and affirmations such as "Wow that takes skill and time, tell me about what you were doing." While Keller and Mott (2020) note that it is important for facilitators to avoid imposing their own words or ideas, we found it was necessary during the first few interviews to share simple observations and respect for the work food service staff was doing, so that we could overcome perceived power imbalances and build relationships based on trust. We consistently implemented active listening and thoughtful questioning, validating thoughts and feelings, and showed respect for the limited time and hard work food service staff do by being flexible and working around their schedules, which varied greatly over the course of the project.

Over time, we found the participants no longer needed our observations and were confident and comfortable explaining their photos. For example, the photograph in Figure 1 shows the staff enthusiastically adding fresh local ingredients to their veggie bags, and the associated quote *"not coming out of a can"* reflects their positive assessment and desire to repeat this F2S recipe. As staff were increasingly encouraged to share their perceptions, both positive and negative, they began to speak openly. Their creativity and photos improved as they became more invested in communicating their experiences, requiring fewer prompts at interviews.

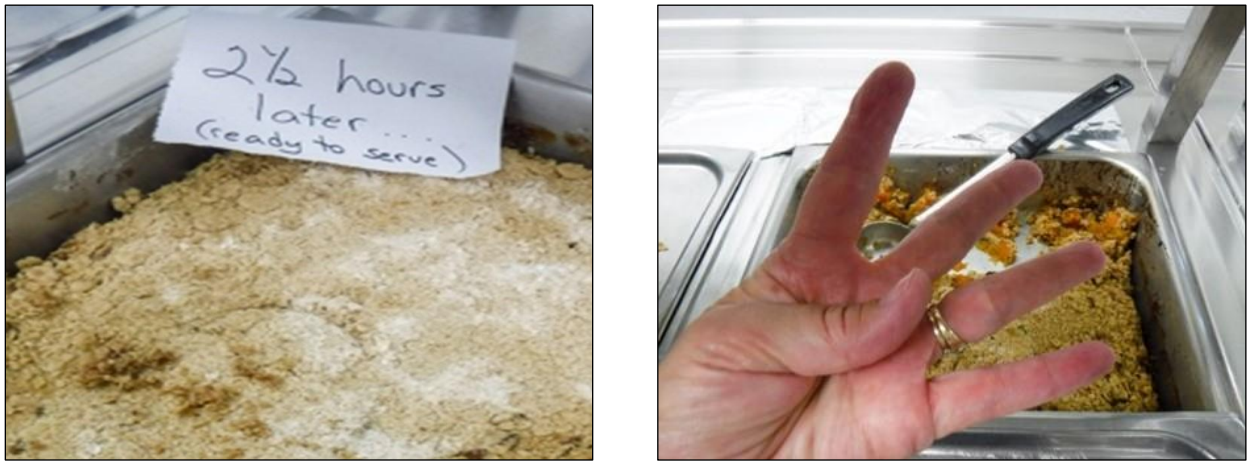
Evaluation

Food service staff communicated messages through their photos that surveys would not detect. For example, Figure 2 shows staff documenting the result of a project recipe by adding in signs showing that the butternut squash (a difficult and time-consuming ingredient) dish took several hours to make, and at the end of the day barely any students had tried it. The project included a recipe evaluation component, including recipe success, student feedback, ease of preparation, recipe feasibility, skills acquired or utilized, time management, and food quality. The two photos in Figure 2 represent a visually dynamic evaluation constructed by the food service staff to demonstrate the substantial time spent cooking the dish and their frustration at having so few students take the dish. In the

Figure 1. "Not coming out of a can": Photovoice Picture Depicting Food Service Staffs' Positive Assessment of a Farm-to-School Menu Item

Photo by Wayne County F2S Project Participant #3

Figure 2. "Felt like we only served four servings out of 100": Photovoice Pictures Enabling Food Service Staff to Share Their Frustration and Feedback with Certain Farm-to-School Project Recipes



Photos by Wayne County F2S Project Participant #3

debrief, staff shared that they would not repeat this recipe due to the challenge of preparing a time-intensive dish that was not well received by students.

Empowerment

Photovoice amplifies voices and cultivates new avenues for problem solving, empowering those involved to recognize their skills for community leadership and scholarship (Budig et al., 2018; Keller & Mott, 2020). Food service staff were encouraged to reflect on and discuss their observations, which empowered them to share insights into the project's practicality. Over the course of the project, staff became more comfortable sharing the structural barriers, such as limited time and limited staff, that contributed to their wariness of the project. As these feelings and issues were acknowledged and validated by the team, staff became more open and honest about which parts of the project were working and which were not. For example, Figure 3 showcases how staff were able to use photography to evaluate and reflect on F2S recipes and school tastes. The staff labeled one of the pictures in Figure 3 as "thumbs down," explaining that "butternut squash is hard to cut up. Did not have enough time.," while labeling the second picture "thumbs up" because "Apple and orange slices go well. Thumbs up for fresh fruit."

These photographs demonstrate the growing sense of empowerment among the food service staff, as they shifted from passive participants who felt required to participate in the project, to active team members energized by the photovoice process and their new ability to share their likes, dislikes, and preferences for various elements of the F2S project.

To celebrate the project, staff were going to curate a community photography exhibit at the end of the 2019-2020 school year, selecting photographs and quotes to display and turn into photobooks. The intent was to share their experiences and build relationships across the community by inviting school staff, school administrators, school families, teachers, county officials, and local food and agriculture organizations. Unfortunately, we were unable to implement this phase of the project due to COVID-19.

Conclusion and Lessons Learned

Photovoice and other creative community-based participatory research methods can be utilized to collaborate with communities, engage with community knowledge, and foster relationships (Budig et al., 2018; Glaw et al., 2017). The utilization of photovoice in this F2S project supported engagement by connecting with school food service staff in a unique way, evaluating and analyzing the project from the perspective of those implementing the changes, and empowering and elevating the

voices of those most impacted by the project. Our experience with photovoice suggests that this is an effective strategy for engaging and evaluating F2S projects and for more broadly empowering our communities, especially vulnerable populations, while embracing innovative methods of engagement and evaluation.

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Figure 3. Photo Taken by Food Service Staff to Demonstrate Attitudes Toward Recipes and Ingredient Preparation

The staff member explained in (a) "Thumbs down: Butternut squash is hard to cut up. Did not have enough time." In (b) "Thumbs up: "Apple and orange slices go well. Thumbs up for fresh fruit."

(a)

(b)

Photos by Wayne County F2S Project Participant #5.

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Appendix. Example of Farm-to-School Photovoice IRB

The Ohio State University Consent to Participate in Research

Study Title: _____

Researcher: _____

This is a consent form for research participation. It contains important information about this study and what to expect if you decide to participate.

Your participation is voluntary.
Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate. If you decide to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose: "Growing a Farm to School Community in Wayne County" is a unique collaboration between _____ and Ohio State University.

This research is being done to understand how the unique perspective food service staff have in implementing the farm to school project. Food service staff in this study will take pictures of their work preparing, cooking, and serving food to school children. Participants will take pictures of how they receive and implement the produce, recipes, equipment, and training supplied by _____. Participants will take photos of the assets and benefits they see in participating in farm to school programming, and also document the barriers that make it harder to engage in the farm to school project to help us learn more about how to better support food service staff in promoting farm to school in their cafeterias.

Procedures/Tasks:
We are asking food service staff members of the _____ and _____ to participate in the photovoice study.

Participants will come to the scheduled project monthly meetings. The number of meetings may be adjusted based on participant feedback and project needs. The meetings will take place in your school in a room food service staff feel most comfortable in that will provide confidentiality and privacy. The project will last the 2019-2020 and 2020-2021 school years. This time period includes a community photo exhibition.

You will take part in a participatory photography project. You will learn (1) how to take photographs and (2) how to analyze the content of these photographs.

Over the course of the project, you will take pictures of things in your school that you think promote a healthy lifestyle, celebration and awareness of local foods and farmers, and document how your own feelings about cooking with local foods and new recipes. You will also document the things that make these goals harder. Each cafeteria will be provided with a notebook for staff to record notes and individual reflections.

You will be asked to only take pictures of farm to school participants over age 18 who agree to be photographed and only of the body parts they agree to be photographed. Please do not take photos of minors, even your children. If you have children and would like to include them in your pictures, please do not take

pictures of their faces, or of anything that may identify them. Please respect the privacy of those in the community.

As part of this research, we will be audio recording meetings for the photovoice project to help us review the discussion and understand more about why participants took their photos.

These recordings will be used for the purposes of this research and will not be used for any other reason.

At the end of the project, you will select several photos that you are willing to have displayed or placed into a photobook and for an exhibition that will be shared in the community. You will be asked to provide captions and descriptions of the photos. You will be invited to take part in the photo exhibition.

Duration:
The project will last the 2019-2020 and 2020-2021 school year. This time period includes a community photo exhibition. Monthly meetings will last 30 minutes and occur during the working day.

You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with _____(Your Institution)_____.

Risks and Benefits:
There are no direct benefits to you by participating in this study. However, you may enjoy participating in this project. There are benefits to society including:

1. This study will provide academics, school administrators, school boards, parents, and the local community with the voice of food service staff on how the farm to school project is being implemented, about the opportunities, challenges, and solutions food service staff identify.
2. This information may also be useful to other community-based organizations, academics, Extension, food service staff, and school districts interested in starting and expanding farm to school projects.

There are minimal risks to you if you decide to participate in the study. There are no right or wrong answers during the discussions of the photos you take. You will not have to discuss anything that you find uncomfortable, and you may withdraw from the study at any time.

Although we will tell all participants that our conversations should not be talked about outside of the photovoice meetings, since it is a group project, we cannot guarantee that. To minimize this risk, researchers will explain to all participants why it is important to maintain confidentiality.

All photos will be taken on OSU digital cameras. Only OSU team members will be downloading the pictures onto OSU password protected laptops. If you would like a copy of your photo(s) we are happy to provide you with the digital copy. If there is a staff member other than yourself in the photo, we will first check with them that they are okay having their photo shared.

We will also explain the possibility of a person being identified as a photovoice participant through their choice of photos to display. We will review each participant's photo choices and quotes and confirm that any individual in the photo is comfortable displaying the photos they choose. Also, no personal identifying information will be collected during the activity. If transcripts of the recordings from meetings are made, any personal identifying information that is discussed will be deleted from the transcripts.

Confidentiality:
Efforts will be made to keep your study-related information confidential. All information collected will be kept on password protected computers and in locked offices on the _____ campus. However, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups (as applicable to the research):

- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency supporting the study.

Will my de-identified information be used or shared for future research?
Yes, it may be used or shared with other researchers without your additional informed consent.

Participant Rights:
You may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at _____(this institution)_____, your decision will not affect your grades or employment status.

If you choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights you may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at _____ reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of research participants.

Contacts and Questions:
For questions, concerns, or complaints about the study, or if you feel you have been harmed as a result of study participation, you may contact the principle investigator _____
by phone at _____ or by email _____
His/Her/Their mail address is _____.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact the Office of Responsible Research Practices at _____.

Signing the consent form

I have read (or someone has read to me) this form and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of participant	Signature of participant
	AM/PM
	Date and time
Printed name of person authorized to consent for participant (when applicable)	Signature of person authorized to consent for participant (when applicable)
	AM/PM
Relationship to the participant	Date and time

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent	Signature of person obtaining consent
	AM/PM
	Date and time

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Reflection on the Groceries to Graduate scholarship program at Missouri Southern State University

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Abstract

In recent years, myriad universities have sought measures to alleviate the burden of nutrition insecurity among undergraduate in order to improve student health and academic success, as the prevalence of nutrition insecurity on college campuses has gained attention from researchers. At Missouri Southern State University (MSSU), faculty launched the Lion Co-op Center for Nutrition Security (LCCNS) in 2018, which focused on research and included a free food and personal hygiene pantry that all students, staff, and faculty were eligible to use. In 2020, the LCCNS piloted the Groceries to Graduate (G2G) scholarship program, which provides advanced undergraduate students (those who have earned 60+ credit hours) in good standing and with financial need with scholarship tokens that can be used as currency at the Webb City Farmers Market, located three miles north of campus. The objective of this program

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was to increase low-income undergraduate access to fresh produce and reduce their financial burden of purchasing high quality food, therefore improving academic outcomes. This reflective essay examines the preliminary findings we obtained about the first two years of the scholarship program. It assesses the methods of communicating with students about the scholarship program, token usage, availability of fresh produce, and student academic success. The initial findings suggest that while the model needs improvement, the scholarships are meeting student needs for access to nutritional food. This market-based solution gives students currency (tokens) so that they can buy directly from local merchants, a model that with some revision may provide a workable model for small universities to address nutritional insecurity among students.

Keywords
Groceries, Graduation Rates, Scholarship, Token, Farmers Market, Nutrition Security, Retention, Academic Success

Background

In August 2018, three professors at Missouri Southern State University networked with each other through the office of institutional effectiveness after all three became concerned about food insecurity on campus. According to surveys conducted in 2018 through MSSU's first-year orientation course (University Experience 100) and the department of kinesiology's Lifetime Wellness courses, 25% of MSSU undergraduates reported that sometimes or often in the past 12 months, "I worried whether our food would run out before we got money to buy more," 21.6% reported that sometimes or often in the past 12 months, "The food we bought just didn't last and we didn't have money to get more," and 30.6% reported that sometimes or often in the past 12 months, "We couldn't afford to eat balanced meals." These questions, taken from the U.S. Department of Agriculture (USDA) short-form survey for assessing food security (USDA Economic Research Service [ERS], 2012), indicate that approximately a quarter of the MSSU student population experiences low-to-moderate food insecurity.

During the fall 2018 semester, the professors launched the Lion Co-op, a food and personal hygiene pantry open to all students, faculty, and staff at MSSU. The professors designed the Co-op pantry to serve as a stop-gap measure for students and staff with immediate needs, many of whom live in local counties within the tri-state region (Missouri [MO], Kansas [KS], and Oklahoma [OK]). The population of Jasper County, MO, in which MSSU is located, is 13.3% food insecure (Bass et al., 2019), above the national average of 10.2% in 2021, or 12.5% for households with children (USDA ERS, 2022). Other local counties where MSSU students and staff are residents have a food-insecure population of over 10%: Barry, MO (13%), Bourbon, KS (12.8%), Cherokee, KS (13.4%), Craig, OK (15.9%), Crawford, KS (14.3%), Delaware, OK (15.6%), Jackson, MO (16.2%), Labette, KS (13.8%), Lawrence, MO (12.8%), Mayes, OK (15.4%), McDonald, MO (13.8%), Newton, MO (12%), and Ottawa, OK (16.5%) (Bass et al., 2019; Hake et al., 2022). In addition to the Co-op pantry, the founders established the Lion Co-op to focus on experiential learning, offering classes, internships, and student-faculty research to investigate more systemic solutions to food insecurity on university campuses and in the tri-state region. In spring 2022, the current faculty advisors renamed the pantry the MSSU Lion Co-op Center for Nutrition Security and moved it to its current location in Spiva Library, one of the central hubs of the campus.

In spring 2020, the professors participated in the Congressional Hunger Center's End Hunger in 30 Challenge through Universities Fighting World Hunger (Congressional Hunger Center, 2020). The 30-day online course highlighted the Houston Food Scholarship Program (HFSP), a partnership with Temple University's Hope Center, which provided grocery scholarships to students in the Houston Community College system (Goldrick-Rab et al., 2020). The HFSP report noted many complications with its pilot program: the supply of produce was unsteady, and participating students did not experience a decrease in food insecurity. Nevertheless, the concept of a grocery scholarship intrigued the MSSU professors because it offered an alternative to the food pantry model. A grocery

scholarship also allows the LCCNS the possibility of addressing one of the campus's target areas: low four- and six-year graduation rates, of approximately 20% and 33% respectively (MSSU Institutional Effectiveness, 2022). It was decided that a grocery scholarship that targeted advanced undergraduates could improve students' chances of finishing their degree.

Whereas the HFSP attempted to bring groceries to campus and tracked rates of food insecurity, the LCCNS Groceries to Graduate (G2G) program uses a token-based system, sending students to a permanent farmers market, and it measures their graduation rates. While not specifically targeting college students, Hunter College's New York City Food Policy Center has undertaken a similar grocery voucher project to handle food insecurity exacerbated by COVID-19. This project, Meals for Good, is similar to the G2G token scholarship model (Gallanter et al., 2022).

Literature Review

Many scholars have recently turned their attention to the problem of nutrition insecurity on college and university campuses. While there is substantial variation in numbers, studies conducted between 2009 and 2016 suggest that at least 10% and perhaps as many as 75% of college students (with an average of about 42%) face some level of food insecurity. These rates are approximately twice as high as the general population (Brito-Silva et al., 2022; Broton, 2020; Bruening et al., 2017; Watson et al., 2017). For Missouri, surveys conducted in the midst of the Covid-19 pandemic suggest that approximately 45% of college students in the state are food insecure (Chrisman et al., in press). While most studies rely on student answers to USDA survey questions to measure the status of campus food insecurity, a recent study asserts that looking beyond the USDA measures and including "factors like housing, time limitations, commuting needs, and the stigma surrounding poverty" (Peterson & Freidus, 2020, p. 125) would provide scholars with a more accurate understanding of the scope of nutrition insecurity on campuses.

The causes of food insecurity among college students vary. The Great Recession that began in 2008 appears to have prompted a rise in food insecurity, but factors specific to attending college, particularly the rapidly increasing costs of attendance coupled with inadequate financial aid, make students especially vulnerable. Independent students, commuter students, undocumented students, first-generation students, and international students are typically more likely to experience risk, especially during semester breaks when regular sources of food on campus can be less available (Bruening et al., 2017; Watson et al., 2017; Wolfson et al., 2021). Race and ethnicity are factors as well, with Black and Hispanic students having rates at least 1.5 times higher than white and Asian students and that can be as high as 3.5 times for Black students in the southeastern United States. Indigenous students are also at higher risk (Alexis et al., 2020; Fausto, 2022; Reeder et al., 2020). LGBTIA+ students also experience food insecurity at higher rates than their heterosexual or cisgender peers, and they more often lack family support to mitigate their financial troubles (Henry et al., 2023; Willis, 2019). Another complicating factor is that college students underutilize Supplemental Nutrition Assistance Program (SNAP) benefits, at least in part because there are specific criteria for students that may make them unaware of their eligibility. (Fausto, 2022).

College students may face additional risk factors and effects regarding nutrition security that are specific to their population. Many students commute and/or share living space with others, which leaves them with insufficient time or space to prepare nutritious meals (Peterson & Freidus, 2020; Watson et al., 2017). Students who live on their own (or with roommates) may also lack the life skills necessary to budget, purchase, and prepare nutritious foods (Knol et al., 2018). A study at a midsized university in southern Appalachia found that food insecurity could contribute to weight gain among college students, because they purchased cheaper, more processed foods, overate when food was available, and prioritized quantity of food over its nutrient contents (Huelskamp et al., 2019). Beyond the short- and long-term health consequences of nutrition insecurity, scholars also point out that enjoying food within a community promotes social cohesion for students, so that ensuring food security in ways that promote social inter-

action is important (Watson et al., 2017). Students who are food insecure risk becoming more isolated from their peers.

Perhaps unsurprisingly, food insecurity has deleterious effects on academic performance. Multiple studies have shown that nutrition insecurity is closely associated with lower grade-point averages for undergraduates; one study found that they are more likely to be in the lowest 10% of academic achievement (Weaver et al., 2019). At another university, "75% of students with a GPA equivalent grade of D/F were food insecure, compared to 42.4% of those with a GPA equivalent grade A" (DeBate et al., 2021, p. 570). Black, Hispanic, and first-generation students who are food insecure are at higher risk of underperforming academically (Camelo & Elliott, 2019; Weaver et al., 2019). A study has suggested that students with severe food insecurity are six times more likely to discontinue their studies than other students (Silva et al., 2017). For retaining students and ensuring they stay on track to graduate, a study conducted at Amarillo College concludes that community colleges and universities must address the obstacle of food insecurity (Lowery-Hart et al., 2020).

Even in cases where students struggling with nutrition insecurity perform satisfactorily in individual courses, studies suggest that the combination of nutrition insecurity and financial stress makes it more difficult for students to progress through their degree program and graduate. Students who have high levels of student loan debt—or even the perception that they have high levels of debt—are less likely to finish their degrees (Britt et al., 2017). Compounding this problem is the fact that students who receive financial aid, especially loans, are more likely to experience food insecurity (Adamovic et al., 2022). Universities that want to increase retention and graduation rates need to work toward solutions that increase financial aid and access to food that do not require repayment.

To increase access to food, many colleges and universities have attempted a variety of approaches, including establishing food pantries on campus. Students who live on campus and/or have lower food security are most likely to use pantries. However, a study conducted at Texas Woman's University (Brito-Silva et al., 2022) suggests that even when campuses open pantries, students continue to face barriers in using the resources. Brito-Silva et al. found that pantries alone cannot adequately meet student needs because they have limited hours, uneven supply, and many students assume they do not qualify to use the pantry. They also found that the stigma attached to pantry usage inhibits students (Brito-Silva et al., 2022). Even when students are regularly using a pantry, the stock of groceries available is typically limited to shelf-stable items, so it is difficult for students to regularly get the fresh, healthy options they need (Brito-Silva et al., 2022). This problem is not unique to campus pantries; in general, pantries tend to stock shelf-stable, calorie-rich foods rather than focusing on nutrient-rich options (Huerbin et al., 2020).

Some colleges and universities have established campus farmers markets instead of or in addition to food pantries. Unlike food pantries, which primarily provide emergency relief for students facing acute hardships, campus farmers markets serve the primary function of connecting students with healthier choices. Campus markets have the most success at either private institutions or those with "strong agricultural ties" (Ward et al., 2014, p. 82). Farmers benefit from the campus "infrastructure to facilitate marketing and logistics" (p. 82) and students, faculty, and staff have the opportunity of "purchasing fresh food directly from farmers while contributing to small businesses in their community" (p. 82). Nevertheless, there are significant challenges with this model. A study conducted at East Tennessee State University found that the establishment of a student-led farmers market proved difficult to sustain due, in part, to timing restrictions caused by the academic calendar and a product liability coverage requirement that put a financial burden on vendors; students, as well, were sometimes unfamiliar with methods to prepare varieties of produce, such as beets, that were seasonally available (Ward et al., 2014).

Programs designed to make fresh foods available to students with identified food insecurity have not yet had unqualified success. A study conducted at a community college in Houston offered selected students a chance to choose up to 120

pounds of fresh food per month from a campus market. But the supply of the available foods varied weekly, less than half of the students who were eligible regularly participated, and there was no marked alleviation of food insecurity nor was there a notable change in diet (Hernandez et al., 2021). A similar program at Texas Woman's University offered students a food scholarship that provided pre-packaged totes of nutritious foods to scholarship recipients. In practice, the produce varied in availability and sometimes did not stay fresh long enough for students to eat it. The study noticed a difference in students' dietary intake over the ten-week duration of the study, but there was no significant change in student level of food insecurity (Alexis et al., 2022).

The literature demonstrates that nutrition insecurity is an immense problem on university campuses across the United States, effecting student well-being and academic success. It contributes to low retention and graduation rates and is immensely difficult to address at the campus level. One could reasonably question why MSSU undertook yet another small-scale scholarship program, when evidence suggests that it is hard to find a model that works. The answer is, in part, practical: MSSU needs to find ways to retain and graduate students, and the administration supports trying creative solutions; a grocery scholarship program is one possible solution, while working in tandem with others. Moreover, the Groceries to Graduate program does not simply replicate models that have not worked at other universities. Rather, it uses tokens that operate as currency to connect students with local merchants who sell nutrition-rich foods regularly (albeit seasonally). Because it uses an existing farmers market, it requires little cost to operate. The first two years suggest a small correlation between scholarship users and graduation. It could be that Groceries to Graduate can provide a model for other schools that are too small to host a market on campus but also need to find ways to increase financial aid to students and facilitate access to food.

Our Process

In fall 2020, faculty advisors with the MSSU Lion Co-op met with the university foundation, financial aid and institutional effectiveness offices to develop a plan to pilot a program that would provide scholarship funds to advanced undergraduates with documented financial need. Because the HFSP report had indicated that bringing a temporary grocery store with fresh produce to campus could be a complicated model, Lion Co-op committed to finding a way to connect students to a more established source of fresh produce with a year-round, reliable selection of items. To this end, the Co-op partnered with the Webb City (WC) Farmers Market. The market is open weekly on Saturdays throughout the year as well as Tuesdays and Thursdays in the spring and summer months. The WC Farmers Market has a demonstrated commitment to facilitating food access by enabling Supplemental Nutrition Assistance Program (SNAP) and Women, Infants, and Children (WIC) participants to use a token currency system to buy fresh produce, dairy, and meat from its vendors, who must grow produce within 50 miles of the market (Webb City Farmers Market, 2023, p. 2). The WC Farmers Market agreed to partner with the Co-op by allowing G2G recipients to use special tokens as currency at its market and subsequently invoice MSSU the amount of the tokens spent at the market each month.

Where other research has attempted to measure changes in students' dietary intake and their degree of food insecurity, the G2G program research project is primarily concerned with whether receiving the scholarship has a positive effect on graduation rates, although alleviating nutrition insecurity of recipients is intertwined with the goal. Tracking graduation rates among scholarship recipients is a straightforward process, but there is no way to truly isolate the scholarship factor to definitively measure its effect on retention and graduation. Similarly, because the program is in its early stages, the number of students participating is relatively small, with seven recipients the first year and 34 the second, which makes extrapolating meaningful conclusions from the numbers difficult. As a result, and because one of the researchers is trained as a historian and is comfortable with textual analysis, the G2G project has relied on surveys and focus-group responses to analyze the effectiveness of the scholarship program.

The Pilot Year

The Lion Co-op piloted the G2G program during the 2020–2021 academic year with financial support from the W. R. Corley Memorial Trust grant and the Missouri Scholarship and Loan Foundation. Through institutional effectiveness and financial aid, the Co-op received names of 17 undergraduates with 90+ credits (senior standing), Pell Grant eligibility, and low Estimated Family Contribution (EFC). Both Pell-Grant eligibility and low EFC are indicators that students might also be food insecure. The credit hour indicator enabled the Co-op to target students who were close to graduation. After the 17 students were identified, the financial aid office and the Co-op sent them letters and followup emails explaining the new G2G Scholarship and notifying them that they were eligible to apply.

Seven students accepted the scholarship. During the pilot program, the financial aid office and the Co-op awarded the students with $320[1] scholarships partitioned over three disbursements of tokens to be picked up from the MSSU bursar window. The Co-op asked students who participated in the program to complete short introductory and exit surveys to provide feedback on the G2G program. All recipients took the introductory survey, and while they overwhelmingly welcomed the scholarship opportunity, only three indicated that they had shopped at the WC Farmers Market before receiving the scholarship. Students indicated that the access to fresh produce was part of the appeal, stating that their regular grocery stores did not often have high quality produce. Other students suggested that the scholarship was welcomed because it alleviated part of the financial burden of buying groceries.

The disbursement process did not go successfully. Many students did not pick up all their disbursements from the bursar, and the WC Farmers Market did not see many tokens in circulation at its weekly markets. Because most recipients did not complete the exit survey, it is impossible to know what prevented them from picking up and using the tokens. All seven recipients graduated successfully (100%), as seen in Table 1. But because so few picked up their entire disbursement, it is impossible to conclude that graduations were affected by the scholarships. It is possible that the amount of the scholarship, $320, was too high, which would explain why the students did not pick up disbursements they did not need. Moreover, only 41% of the eligible students we identified expressed interest in the scholarships in the first place.

The Second Year

For the 2021–2022 academic year, the Lion Co-op received grant funding from the W.R. Corley Memorial Trust, the Church World Service CROP Walk, and the Boylan Foundation to fund multiple G2G scholarships. The financial aid office and the Co-op awarded each $200 scholarship (a revised amount) in four, sequential, monthly $50 token disbursements to be picked up at the bursar window. The financial aid office and the Co-op distributed the scholarships on a rolling basis, with applicants who met the qualifications being awarded the scholarship after they applied.

Because reaching out to students via letter and/or email had a low response rate during the pilot year, Lion Co-op printed fliers and targeted students during Priority Registration in the fall 2021 semester. We considered that the response rate had been low because students either ignore email and/or question the legitimacy of the scholarship offer. But Priority Registration is an MSSU program that gives preference to currently enrolled students (in order of class standing) to enable them to register early for the subsequent

Table 1. Graduation Numbers for 2020–2021 Groceries to Graduate (G2G) Recipients

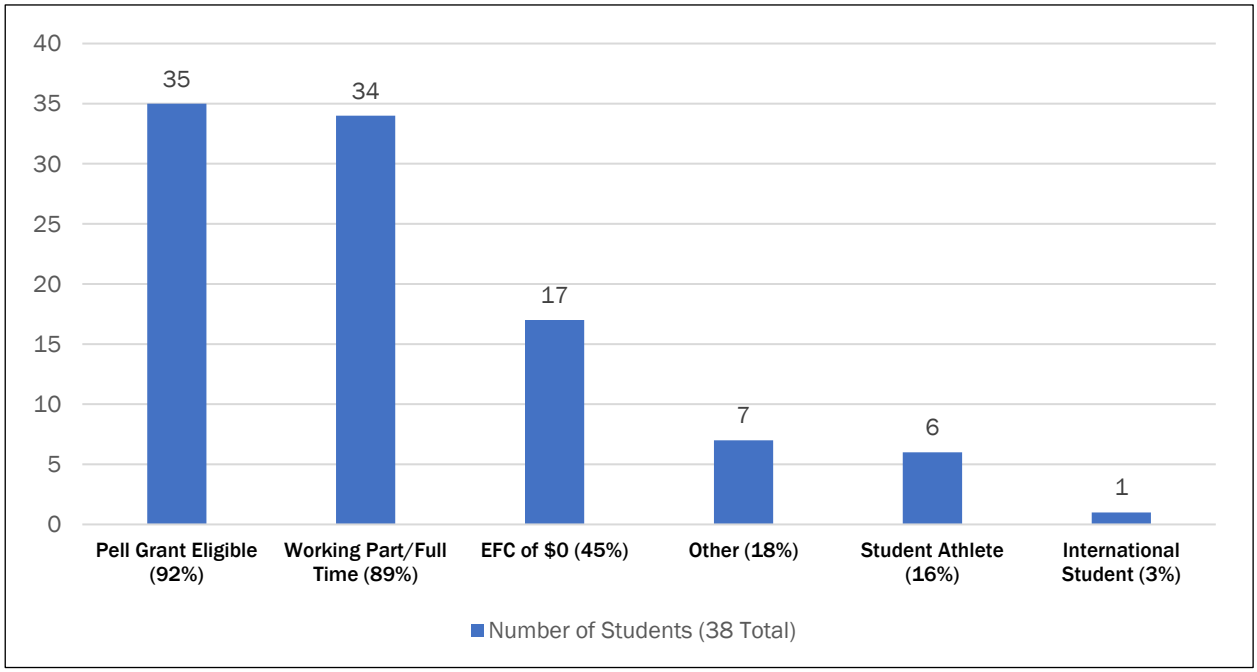
Fall 2020	Spring 2021	Fall 2021	Spring 2022
3	0	1	3

[1] All currencies are in U.S. dollars.

semester. Students are encouraged to meet with their academic advisors before registering to ensure that they are making progress toward their degree. These meetings allow advisors, who typically have an established relationship with students, to reach out with information about the G2G scholarship. The Co-op perceived that students would be more receptive to information from a trusted academic advisor, whereas they typically do not closely read email and written communication from the university. The Lion Co-op provided printed fliers to the departments of kinesiology, psychology, social work, and social sciences, all of which work closely with the Co-op, and gave fliers to students advised by Project Stay and the Advising, Counseling, and Testing program. Project Stay advisors work specifically with first-generation college students, a group at risk for food insecurity. Advising, Counseling, and Testing advises undecided students, general studies majors, and regularly sees students who are experiencing stress or crises. The Co-op also sent electronic fliers to faculty advisors via email and notified other students through their Blackboard course sites. The Co-op invited interested students to apply for the G2G scholarship through a Microsoft Form, in which students self-reported their enrollment status, earned credit hours, and whether they fit into any of the following categories: Pell Grant eligible, EFC of $0, international student, student athlete,[2] working part/full time, and any other factor they believed would make them eligible for the scholarship. In the last category, students remarked that they lived alone, participated in Project Stay, or were a stay-at-home parent. The results are recorded in Figure 1.

Of the students who applied for the scholarship, the Co-op only turned down those whose enrollment could not be confirmed or who had not earned at least 60 credit hours (changing eligibility from 90+ credits to 60 allowed us to increase our pool of eligible students to include those with junior standing). Over the academic year, the Lion Co-op awarded 37 G2G scholarships at $200 each.[3]

Figure 1. Student Population Qualities (Self-Reported)



[2] MSSU is a Division II school with many athletes on partial scholarships. They are more likely than other students to live on campus and are more likely to be living on campus when dining services are unavailable. They have been frequent users of the Lion Co-op's food pantry, so recording whether they also apply for the G2G scholarship is helpful.

[3] Not all scholarship recipients picked up all four of their $50 token disbursements. Three recipients picked up no disbursements, four

The recipients who completed an exit survey mostly identified as women (76%), and the vast majority lived off campus (90.9%). This cohort of scholarship recipients is more racially diverse (20% American Indian, 10% African American, 10% white, Hispanic) than the rest of campus, and is diverse in sexual orientation, 36.4% identifying as homosexual, asexual, or bisexual.[4] The data also reveal that recipients are much more likely to be Pell Grant-eligible (95%) than the campus as a whole (56%) (MSSU Institutional Effectiveness, 2022).

After students received the scholarship and had an opportunity to use tokens, they were asked to participate voluntarily in an exit survey with the USDA questions about food insecurity. These questions, which are used nationally as well as at MSSU, help the Co-op to gauge what level of food insecurity recipients of G2G scholarships are experiencing relative to their peers. Eleven of 34 students responded, and their answers show a moderate level of food insecurity. Most salient, the students expressed worry about running out of food and making decisions to purchase cheap food and unbalanced meals (Figures 2–4) despite doing most of their shopping at grocery stores or superstores rather than relying heavily on convenience and discount stores. In other words, nutrition insecurity served as a motivating factor for students who applied to participate in the scholarship program.

Figure 3. Responses to question "To what extent do your meals include cheap foods because you are running out of money to buy food?" (*N*=11)

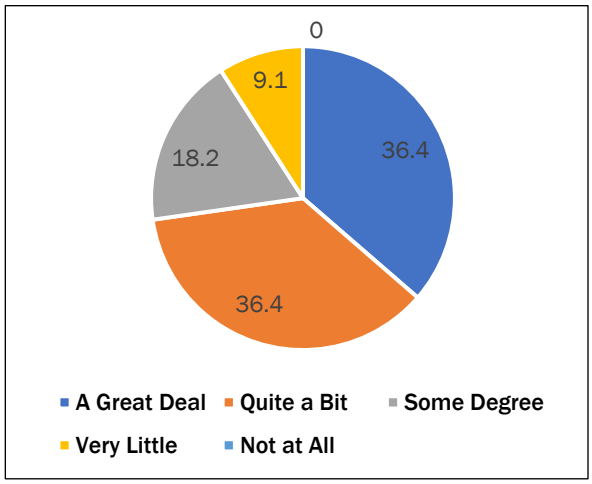


Figure 2. Responses to question "To what degree have you worried that food at home would run out before you got money to buy more?" (*N*=11)

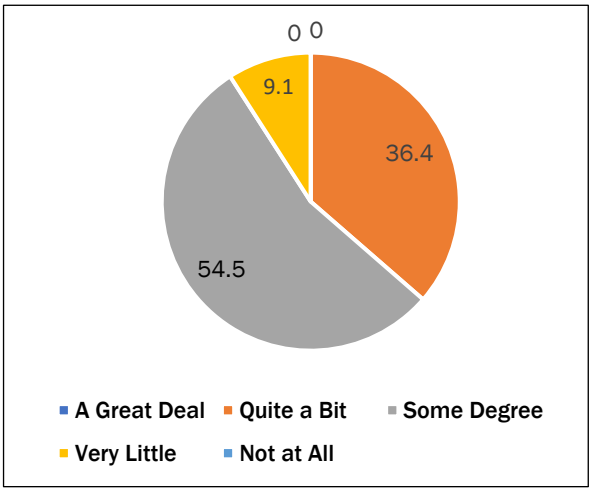
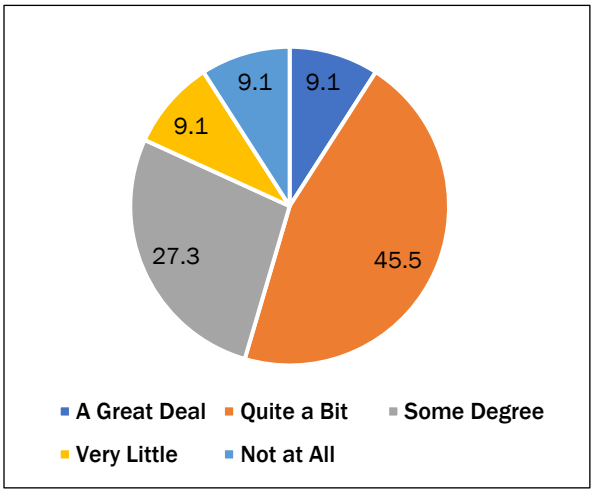


Figure 4. Responses to question "How often were you not able to eat a balanced meal because you didn't have enough money?" (*N*=11)



picked up only one disbursement, three picked up two disbursements, eight picked up three disbursements. Total token disbursements were $5,500, which equals about 27.5 scholarships.

[4] MSSU's student population is approximately 26% BIPOC, according to data from 2021; 18.5% of the students identify as either Hispanic, Native American, or Black/African American, and 61% identify as women. MSSU does not report student sexual orientation or gender identity.

Monthly token usage at the WC Farmers Market for 2021–2022 was more reliable than token usage during the pilot year. A majority of the recipients who completed the survey reported that they had personal transportation that allowed them to get to the market (81.8%). While 63.6% of them had shopped at the market before, 36.4% of the students added the market to their options for buying groceries. Multiple students pointed out that the disbursements did not last all month. The vast majority of recipients who responded to the survey emphasized that the scholarships provided access to "healthier filling foods," "healthy groceries," and "fresh vegetables instead of canned ones" (72.7% included words like "healthy," "fresh," or "balanced" in their discursive responses). Essentially, for students who have the skills and the desire to prepare meals using fresh ingredients and locally sourced protein, the scholarship gave them the opportunity to do that. However, students did note the seasonal shifts in the market. One survey respondent pointed out, "I've only been able to go once since it's only open one day out of the week and due to the season, there aren't many fresh items in season. The variety isn't great to choose from." While this was only one response, it does suggest that there are limitations to shopping at a farmers market.

Periodic token usage reports from the WC Farmers Market demonstrate that scholarship recipients during the second year shopped at the market with much greater frequency than during the pilot year. However, while usage patterns, as seen in Table 2, suggest that students were able to get more products at the market in the summer and fall than in the winter months, they also indicate that some recipients may save their tokens for times when the market stocks produce and meats that suit their needs best (the tokens do not expire once they have been disbursed). The source of data to track usage are the invoices, which come irregularly from the WC Farmers Market. In the first two years, there was no mechanism for tracking which students always picked up disbursements and then used them regularly, although we have subsequently been able to ascertain that 38 token disbursements were not picked up (totaling $1,900).[5] In addition to indicating that the market is better

Table 2. 2021–2022 Token Usage at Webb City Farmers Market

1/23/21–7/31/21	9/11/21–11/06/21	11/20/21–12/24/21	1/8/22–1/29/22	2/5/22–3/5/22	3/12/22–4/30/22	5/7/22–7/30/22
Leftover Disbursements from AY 2020-21	5 scholarship students + leftover disbursements	19 scholarship students receiving 36 disbursements during the invoice period	15 scholarship students	18 scholarship students	14 scholarship students receiving 21 disbursements during the invoice period	8 scholarship students receiving 15 disbursements during the invoice period
2,240 tokens disbursed by MSSU	250 tokens disbursed by MSSU (2265 in circulation)	1,700 tokens disbursed by MSSU (3639 in circulation)	750 tokens disbursed by MSSU (3626 in circulation)	900 tokens disbursed by MSSU (4267 in circulation)	1,050 tokens disbursed by MSSU (5079 in circulation)	750 tokens disbursed by MSSU (4854 in circulation)
225 tokens used (10%)	326 tokens used (14%)	763 tokens used (21%)	259 tokens used (7%)	238 tokens used (5.5%)	975 tokens used (19%)	1,420 tokens used (29%)
~8 tokens used/week	~36 tokens used/week ~7 tokens used/student/week	~127 tokens used/week ~7 tokens used/student/week	~65 tokens used/week ~4 tokens used/student/week	~47 tokens used/week ~3 tokens used/student/week	~122 tokens used/week ~9 tokens used/student/week	~109 tokens used/week ~14 tokens used/student/week

AY = Academic Year
Invoice periods note: Each token is worth US$1.00

[5] Because of this limitation in the first two years, we have started working with the bursar in our current, third year, to track which students are not picking up their tokens. Still, our only mechanism for tracking usage will be the invoices we receive from the market.

stocked in the fall than in the winter, this table also suggests that the students who reached out about the scholarships early in the semester were more committed to using the tokens than those who found out about the scholarships during registration appointments with their advisors.

In April and May 2022, the Co-op invited all students who received a G2G scholarship during the 2021–2022 academic year to participate in one of two focus groups which were held over Zoom. Overall, six students participated. The Co-op asked the students a series of questions:

- How has the process of picking up tokens worked? What could be improved?
- Has communication from the Co-op been clear? What could be improved?
- How convenient is it to use the WC Farmers Market?
- Are you able to get items you need at the WC Farmers Market?
- To what extent do you think your grocery buying has changed because of the scholarship?
- Have you been able to devote more time to your studies this year?
- What challenges have you faced using the tokens?
- Other thoughts?

Overall, the students reported adequate communication and a clear process of receiving the token disbursements (although a student with young children did note that stopping twice on campus—once at the Co-op and once at the bursar—necessitated unloading children two times). The students voiced satisfaction with the WC Farmers Market but pointed out that the supply of produce varied significantly during the winter months and when the weather was bad (rainy or snowy). This year, protein was less reliable than vegetables. While the scholarship disbursements of $50 did help offset some cost, all students continued to rely on a grocery store, especially late in the month. One participant said that with a big family the tokens lasted about two weeks, and then the family used a grocery store for the rest of the month. One student commented that they used the market for meat and produce and used Aldi and Walmart for their other groceries. Two students commented that they used the market items as the base of meal preparation and used items from Food 4 Less or other grocery stores to complement their market purchases.

Students reported in the focus groups that their scholarly progress toward their degrees remained steady, ranging from "great" to "OK." While the scholarship is a small amount, one student noted that "it's a help; not a huge help, but every little bit helps." While it does alleviate some financial strain, one student pointed out that it takes additional time to travel to the market in addition to a grocery store. Another student suggested that her family had found a way to work around the time constraints: unlike the Lion Co-op's food pantry, which requires a student ID to use, the tokens require an ID only at disbursement. They can subsequently be used by any family member at the market. This student's parents used her tokens to buy food on Saturday mornings while the student stayed at home and studied.

Graduation rates for the entire 2021–2022 G2G scholarship cohort cannot be determined yet. So far, 20 scholarship recipients have graduated out of 41 recipients, a percentage of 48.8 (Table 3). This suggests a positive correlation between receiving the scholarship and graduating successfully, as compared to the MSSU student population.

Conclusions

In the first two years, the Groceries to Graduate scholarship program served a small number of undergraduate students at MSSU, but the initial feedback from the program suggests that students

Table 3. Graduation Numbers for 2021–2022 G2G Recipients

Fall 2021	Spring 2022	Fall 2022	Spring 2023	Fall 2023	Spring 2024
1	10	3	6		

who receive the scholarship are likely to increase their access to nutrition-rich foods and to graduate successfully. That the students self-select by choosing to apply for the scholarship most certainly affects these results. It could be that students proactively working toward graduation also purposefully seek out scholarship opportunities; perhaps they would have graduated without the scholarship. It is also clear from survey and focus group responses that the students who chose to apply for the scholarship prefer nutrition-rich produce and meats and have the skills to prepare them. According to the WC Farmers Market manager, the "market has loved the energy the college students bring with them to the market. They are curious about some of our less known [*sic*] vegetables, like luffa, and excited to learn how to prepare them at home (WC Market Manager, personal communication, July 26, 2022). Nevertheless, the early data suggest that the scholarship can alleviate some hardship for advanced students working to finish their degrees, and it does so in a way that does not require students to choose between eating healthy foods and accruing more student debt.

The G2G scholarship program has also allowed the Lion Co-op to attempt to meet the needs of a different student population than that the organization serves at the Lion Co-op pantry. In fact, at least one recipient was unfamiliar with the Co-op's pantry, although other recipients noted that they were combining shelf-stable items from the pantry with produce and meat purchased with market tokens. But the pantry tends to carry items that are microwavable or otherwise easily prepared (especially in dormitories), and its inventory varies based on what is available through donations and our suppliers. The scholarships connect students to fresh foods that allow off-campus students to cook in kitchens. The scholarship program empowers recipients to make personal choices about the groceries they purchase from the market, which is less common for food insecure people who regularly have little choice in the assistance they receive. Conversely, "the MSSU students … [thank] the farmers and beekeepers they purchase things from. The few I [the market manager] have talked to have mentioned that this program has introduced them to what farmers markets are, and they love shopping with local producers" (WC Market Manager, personal communication, July 26, 2022). Scholarship tokens go directly to local producers and back into the local community. As Joe Palmer of Fairhaven Farm explains, "The program is a win for everyone. It brings new shoppers to the market, so farmers win. It brings fresh food to students who don't have any, the kids win" (WC Market Manager, quoted in personal communication, July 26, 2022).

And yet the low usage rates of the tokens suggest that scholarship recipients still face significant barriers when trying to use the tokens at the market. Recipients generally have their own transportation, so that is not a significant barrier. However, picking up the tokens from the bursar's window and then planning time to shop at the market in addition to other grocery trips potentially limits student access to the market, according to focus group responses. Removing these barriers to token usage continues to be our focus, and we have expanded our exit survey for the third cycle of the scholarships, asking for questions about accessibility to better understand the impediments. Likewise, the Co-op is considering other local producers/vendors who might be willing to partner with it on similar token systems, voucher systems, or weekly/monthly produce subscriptions. These types of expansion could increase both access and usability of the scholarships.

In addition to increasing usage among scholarship recipients, the Co-op continues to work to improve its ability to recruit applicants. The current model, which relies on academic advisors to recruit students to apply, works more efficiently than emails or letters from financial aid, which students seem to ignore most of the time because the volume is so overwhelming. Building trusting relationships with students through academic advisors seems to be key to the success of the scholarships (and most certainly crucial to student retention and graduation). Expanding these recruitment/informational conversations to all departments on campus is one of the goals of the Co-op's scholarship program over the next five years. We also directly speak to students about the scholarships during outreach events like MSSU's Campus Involvement Day and through announcements on

campus social media. Likewise, research at other universities suggests that we need to work with other offices on campus, such as the deans of students and admissions, to determine where MSSU's specific retention issues arise. While a study conducted in southern Florida suggests that students in their third and fourth years of undergraduate study are at greater risk of food insecurity (DeBate et al., 2021), a study from a western university found that students struggled earlier in their path toward their degrees (Camelo & Elliott, 2019). It could be that MSSU needs to revise its eligibility to include those who have made less progress toward their degrees.

In addition to increasing access, securing financial sustainability continues to be a long-term goal of the project. The small grants are annually available, and they allowed us to launch the program. In April 2022, we hosted an Empty Bowls fundraiser on campus to raise funds for the scholarships. We plan to host this fundraiser annually as it was well-supported by local businesses and well-attended (we sold approximately 125 tickets both years). The Co-op is also in the early stages of securing larger funding sources, including grants, that would enable the organization to increase the number or dollar amount of the scholarships.

Overall, the Groceries to Graduate scholarship program remains a small project focused on increasing access to nutrition-rich foods for advanced undergraduate students in a region where levels of food insecurity are higher than the national averages. We believe that our model may prove useful for other small universities working to alleviate nutrition insecurity among their students. While we observe that our model shows promise at helping students on an individual level, we find ourselves in agreement with other scholars who have called for more robust studies of the effectiveness of interventions on college campuses (Davis et al., 2021), and we are committed to continuing to study and revise our model to ensure that it fosters student well-being and academic success.

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Food access in Kalamazoo, Michigan: A spatial analysis

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Abstract

Healthy and affordable food is a universal human need. In the U.S., food access is often limited in low-income areas as opposed to medium- and high-income areas. To address disparities in the availability of healthy foods, the dispersion of food access points needs to be quantified and documented. Nutritional quality and consistency of availability vary across different types of food access points, including permanent grocery stores, farmers markets, community gardens, food pantries, and convenience stores. Accessibility is also determined by the means of transportation available or required to get to food access points (public transit, driving, or walking). In this geographic information systems (GIS)-based analysis, we identify differences in accessibility to distinct types of food access points—reliable, seasonal, and lower quality—between low-income and higher-income tracts in the City of Kalamazoo, Michigan. We found that all full-service grocery stores are accessible via bus routes in the City of Kalamazoo; however, 11% of people reside in low-income areas with low access to these grocery stores—beyond the 0.25-mile walkable distance to bus routes. We then asked whether the addition of community gardens, food pantries, and farmers markets, on the "plus" side, or convenience and dollar stores, on the "minus" side, changes the food access landscape in this community. We found that the "positive" access points served areas that already had access to grocers, while "negative" access points filled the access gap in lower income areas. More than twice as many low-income residents had walkable access to convenience stores—which provide lower-quality and highly processed food—with 81% of them being located within low-income tracts. Geographical analysis of

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low food access and low-quality food access is important to identify structural patterns, but it needs to be paired with interview-based community assessments to ascertain how residents actually procure their food.

Keywords
Geographic Information Systems, GIS, Public Transit, Food Access, Grocery Stores, Farmers Market, Community Gardens, Convenience Stores, Income Data, American Community Survey (ACS), Food Environment

Introduction

Food access is a fundamental human right and should be prioritized on a national and local scale. Food insecurity is defined by the U.S. Department of Agriculture (USDA) as the inability of a household to acquire food that meets the nutritional needs of its members. This inability is present on a national scale, with 33.8 million people categorized as living in food-insecure households in 2022 (USDA, 2022a). Lack of access to food is proven to have detrimental health effects, including increased risk of obesity, heart disease, diabetes, mental disorders, and other chronic diseases (U.S. Department of Health and Human Services [HHS], 2023). Alongside these negative health impacts, food insecurity has been associated with an economic burden of over US$167.5 billion annually (Shepard et al., 2011). These long-term impacts of a lack of access to healthy food are not only detrimental to the health and well-being of individuals, but to society.

Food insecurity occurs for a variety of reasons, one of which is barriers to food access points. Areas with low access to affordable, healthy food are referred to as "food deserts" and are often associated with a higher percentage of residents experiencing poverty (HHS, 2023). Other authors have used the term "food apartheid" to reflect the systemic injustice, resulting from government policies and discrimination, that has led to inadequate access to social services (Brones, 2018). The formal definition of low grocery store access is defined as at least 33% of the population being greater than one-half mile from the nearest grocery store (USDA, 2022b). However, this definition does not adequately consider the amount of time needed to obtain groceries and cook a meal that meets the nutritional needs of a household. Previous studies have shown times of five minutes and distance of around a quarter of a mile to be a more reasonable threshold than that of the USDA-defined one-half mile (Kotval-K et al., 2021; Steuteville, 2017; Yang & Diez-Roux, 2012).

Government programs such as the Supplemental Nutrition Assistant Program (SNAP) have been implemented to relieve the economic burden of food access for low-income families. According to the USDA, in Michigan, 13% of the state population receives monthly benefits from SNAP, with the national average at 12% (Center on Budget and Policy Priorities [CBPP], 2023). Even though SNAP is widely used, not all food access points accept its benefits, as they do not stock required items (Ross et al., 2018).

Food access points vary in nutritional quality of food, reliability, and affordability. Grocery stores—defined as retail stores that carry healthy food options (such as fresh fruit, vegetables, fish, and poultry)—are seen to be a reliable permanent resource (U.S. Census Bureau, 2022). Food pantries, community gardens, and farmers markets provide additional locally sourced yet affordable resources while promoting a sense of community (Ferris et al., 2001; Kantor, 2001). However, community gardens and farmers markets are limited due to their seasonality, and food pantries can be unreliable, with food that is often close to expiration and lacking protein (Kordon et al., 2022; Long et al., 2023). Convenience stores are retail businesses with a wide range of common items, including frozen prepared foods; however, they typically provide unhealthy food options, like high-fat items and sugary drinks (Xin et al., 2021).

Public transit, vehicle ownership, and walkability (sidewalks, infrastructure, bike lanes, etc.) influence accessibility to these food access points. These factors vary throughout cities and are heavily influenced by the financial situation of households. Studies in cities such as Grand Rapids, Michigan and Portland, Oregon have shown that there are more food access points in wealthier census tracts, and that higher costs are associated with socioeconomically disadvantaged tracts

(Breyer & Voss-Andreae, 2013; Kotval-K et al., 2021). In particular, low-income areas tend to have more convenience stores that offer lower-quality food (Chenarides et al., 2021; Hilmers et al., 2012).

In addition to affecting socioeconomically disadvantaged populations, food insecurity has been shown to have disproportionate effects on persons from racial and ethnic minorities. An analysis examining trends in food insecurity from 2001 to 2016 found that food insecurity rates for both non-Hispanic black and Hispanic households were at least twice that of non-Hispanic white households (Odoms-Young & Bruce, 2018). These racial and ethnic disparities are associated with historical factors, including residential segregation, poverty, and neighborhood deprivation. The history of "white flight" during the periods of 1950s-1980 can be seen in many northern urban communities (Boustan, 2007). In Kalamazoo, Michigan, a mass movement of wealth and industry away from the city center led to a disinvestment in food access for urban areas in the city (Shultz-Purves, 2013).

We chose to explore the geography of food access in the City of Kalamazoo due to its size, historical background, variation in income among census tracts, and because we live in this city. We aimed to study food insecurity by examining the distribution of public access to different food purveyors (Leroy et al., 2015). By spatially examining accessibility of reliable nutritious foods (grocery stores), unreliable but healthy food sources (seasonal pop-ups), and lower quality food sources (convenience stores), we highlight areas in which food security in Kalamazoo can be improved.

Methods

All data used in our analysis were obtained from publicly available online sources. We used the open source software QGIS-LTR (3.22) to conduct all spatial analyses and create our maps.

Proportional Census Tract Calculation

Since some census tracts crossed the City of Kalamazoo boundary, we calculated the proportion of those tract areas that fell within the City of Kalamazoo, and, assuming that the populations were homogeneously distributed within the tracts, adjusted the population size within the city portion of the tract accordingly. We used similar proportional estimates of population for all areas in our study.

Classification of Income Data

American Community Survey (ACS) data from 2018 was joined with census tract data using the software QGIS-LTR (3.22). To quantify the income data, we grouped the ACS 2018 median incomes into seven categories: $15,000–$24,999, $25,000–$34,999, $35,000–$44,999, $45,000–$54,999, $55,000–$64,999, $65,000–$74,999, and $75,000–$84,999.[1] The ACS defines low income as any income falling below the median, and hence the census tracts that fell below the median income in Kalamazoo ($44,296) (U.S. Census Bureau, n.d.) were categorized as low income (Figure 1).

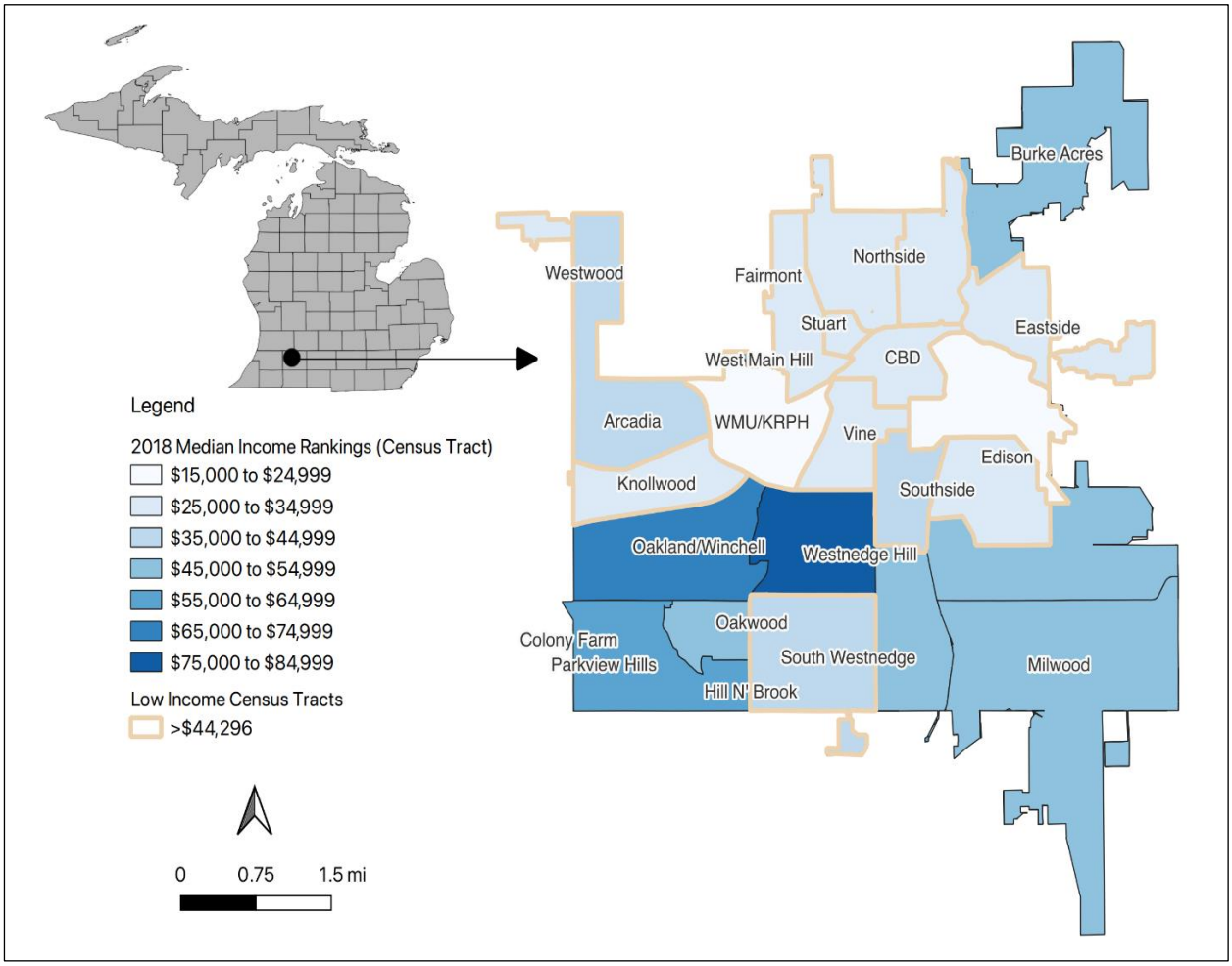
Classification of Grocery and Convenience Retailers

Grocery stores and convenience stores were classified using the North American Industry Classification System [NAICS] (U.S. Census Bureau, 2022). NAICS classifies supermarkets and other grocery retailers as serving canned and frozen foods, fresh fruits and vegetables, and fresh and prepared meats, fish, and poultry. Convenience stores are primarily engaged in retailing a limited line of groceries that usually includes milk, bread, soda, and snacks. We used the function My Maps in Google Maps to mark the location point for each retail store. Google Maps, reviews, descriptions, and photos were used to determine the food items sold at each store. We researched convenience and grocery stores located in Kalamazoo, Michigan and then further determined if each retailer fit the NAICS classification for either a convenience or grocery retailer. Other websites were also used to ensure all retailers fitting either the grocery or convenience NAICS classification were accounted for in the City of Kalamazoo. Eleven grocery stores are located within the City of Kalamazoo and 14 grocery stores were included that are outside the City of Kalamazoo, with a total of 25 grocery stores mapped in our study. Twenty-five

[1] All currencies in this article are in US$.

Figure 1. Map of the City of Kalamazoo Census Tracts Showing 2018 Median Income

Income rankings were divided into 7 categories: the darker the shade of blue, the higher the median income. Low-income tracts were categorized as any tract that fell below the 2018 median income of $44,296, and these low-income tracts are outlined in beige. Names refer to neighborhoods within the city. CBD = Central Business District (downtown).



convenience stores are located within the City of Kalamazoo and six convenience stores were included that are outside the City of Kalamazoo, with a total of 31 convenience stores mapped in our study. We included the 14 grocery and six convenience stores that were within 0.25 miles of the city limits to ensure all accessible points were included.

Acceptance of Supplemental Nutrition Assistance Program (SNAP) Benefits

SNAP provides nutrition benefits to supplement the food budget, and we wanted to ensure that we represented each convenience and grocery store with the correct benefits. To ensure each convenience and grocery retailer accepted SNAP, the USDA SNAP retailer locator was utilized (USDA, 2019) and cross checked with the list of retailers. All convenience and grocery stores included in our study accept SNAP.

Low-Income and Low-Access (LI-LA) Areas

We define "low-income and low-access" (LI-LA) areas as those within the City of Kalamazoo that were both low income, as defined above, and more than a 0.25-mile walk to a bus stop. There are 21 bus routes in the City of Kalamazoo, and each bus route was traced using the My Maps tool in Google Maps. The bus routes were then transferred to QGIS as a KML file. The USDA uses a definition

of 0.50 miles as "access," considering that residents living within 0.50 miles of a resource are willing and able to walk that distance to access it (USDA, 2022b). Other studies, however, show this definition as unrealistic, and show commute times of five minutes with a quarter mile to food access points as more common (Kotval-K et al., 2021). Therefore, we used a 0.25-mile buffer around bus routes to estimate access to a grocery store. The low income (less than the average 2018 median income of $44,296) census tract layer was clipped with a polygon representing a 0.25-mile buffer around all bus stop routes using the QGIS "Clip" tool. The resulting low-income areas that did not fall within a 0.25-mile buffer were then considered low-income and low-access areas. We estimated population sizes within the LI-LA areas based on proportional area, again assuming homogeneous density of residents within the census tracts.

Supplemental Resource Access

Community gardens, food pantries, and farmers markets are a means of supplemental access to food for many individuals. We asked if these resources expanded access for the LI-LA parcels identified in previous steps. We identified every community garden, food pantry, and farmers market in the City of Kalamazoo on Google Maps and uploaded the layer to QGIS as a KML file. Within the city, we generated 0.25-mile buffers around these additional access points as above, assuming as before that this distance represents a reasonable distance for residents to walk to these food sources. We clipped the LI-LA layer again with this new buffer layer, since additional walkable zones around additional sources of quality foods would increase access and therefore decrease the size of the LI-LA.

Greater Barriers to Access

In our QGIS analysis, we did not consider obstacles residents might face when walking to bus stops or directly to grocery stores: availability of walking paths or safe sidewalks, crosswalks, presence of graveyards, schools, or industrial sites, etc. To investigate some of these obstacles for a subsample of the city, we selected the highest income tract and lowest income tract for comparison. The census tract that had the highest income (tract 12) was in the Westnedge Hill, Oakland, and Winchell neighborhoods (Figure 2) with a median income of $76,339. The lowest income tract (tract 15.04) had a median income of $21,786 and was in the neighborhood that encompassed the Western Michigan University (WMU) and Kalamazoo Regional Psychiatric Hospital (KRPH) campuses. Because this tract is comprised of university student housing and we did not account for dining halls, we also examined the second lowest income tract (15.07) with a median income of $26,045, located on the Eastside of Kalamazoo. Using the "Random points inside polygon" tool in QGIS, three random points within each of these three tracts were created. We used the Kalamazoo County roads layer (Michigan GIS Open Data, n.d.) to determine the street address nearest to each randomly selected point, and used Google Maps to determine the time it would take a resident to get to the grocery store. Time of day for the estimate was set to Saturday April 15th at 12 noon. For each point, the time spent driving, walking, and riding the bus to the nearest grocery store or supermarket was recorded (Table 1; Figure 2). Estimates do not include wait time at bus stops, which are similar throughout the transit system.

Results

There are 28 census tracts in the City of Kalamazoo. Fifteen of these tracts were categorized as low-income: any tract where 50% or more of households fell below the 2018 median income of Kalamazoo, MI ($44,296). The other 13 tracts were identified as medium to high-income (Figure 1). The total population within the City of Kalamazoo is 80,047 people. Of that total population, 53,845 people fall into low-income tracts (67%) and 26,202 people fall into medium to high-income tracts (33%).

All grocery stores in Kalamazoo fall within a 0.25-mile buffer of the city bus routes. We classified the low-income areas that fall outside the 0.25-mile buffer around the bus routes as LI-LA (Figure 3). Only 6,015 (11%) of the 53,845 low-income residents of Kalamazoo fall within LI-LA areas. However, most households (88%) use their own vehicle to get to the store (Ver Ploeg et al., 2015). Therefore, in addition to bus transportation, we

Figure 2. Case Study: Time Comparison of Grocery Store Access Based on Income

Three census tracts were mapped (15.04, 9, and 12) on QGIS to estimate commuting time to the closest grocery store on a Saturday at 12:00 PM from the averages of three random points (Table 1). Kalamazoo bus routes are shown in gray and a Google Maps overlay is present.

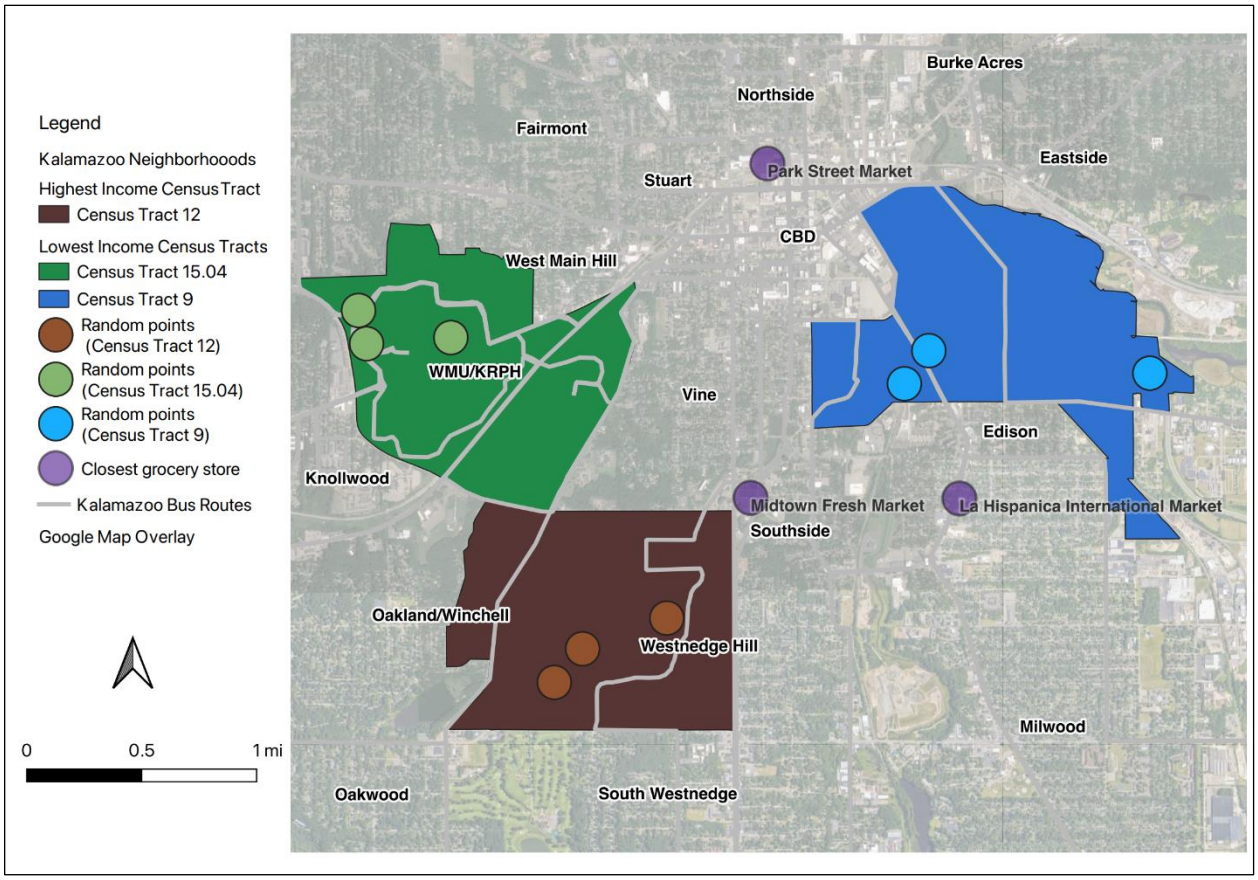


Table 1. Access to Grocery Stores from Three Random Points in Each of the Three Census Tracts

Time and distance to stores by car, bus, and on foot are shown for the highest-income tract (12, brown in Figure 3), and the two lowest-income tracts (15.04 and 9). Measurements are in miles or minutes:seconds.

Census Tract	15.04	Standard Deviation	9	Standard Deviation	12	Standard Deviation
Mean Distance Of Closest Grocery Store (Miles)	2.33	0.12	1.00	0.28	1.33	0.25
Driving (Average time in minutes:seconds)	8:20	2:37	3:30	2:32	4:20	0:48
Bus Commute (Average time in minutes:seconds)	21: 40	1:41	12:40	14:10	24:49	18:50
Walking (Average time in minutes:seconds)	40:00	3:34	19:20	9: 25	21:00	9:09

also looked at accessibility by car and walking. We estimated the time it would take to travel to the nearest grocery store by either bus, foot, or car for residents in the highest income tract and the two lowest income tracts within the City of Kalamazoo (Figure 2). We found nearly double the driving time and double the walking time in the lowest income tract compared to the highest income tract (Table 1). Since that lowest income tract comprises of students at Western Michigan University, who

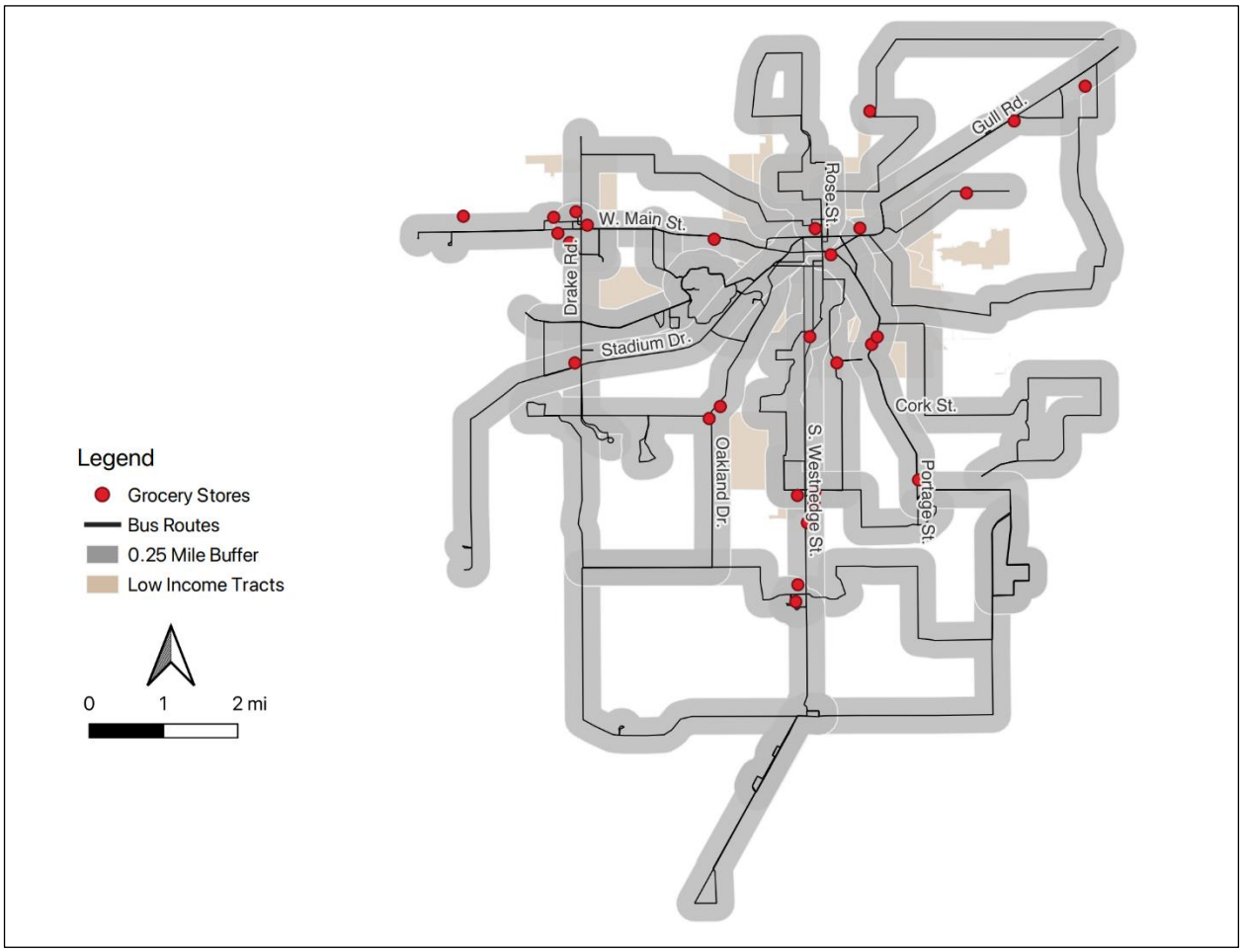
may be low-income but also may have access to dining halls and do not represent typical residents, we also considered the second lowest income census tract (Tract 9). For that comparison, we did not find a clear difference in bus, walking, or driving access to grocery stores.

Solutions to improve healthy food access include encouraging the establishment of farmers markets, community gardens, and food pantries (Kotval-K et al., 2021). We looked at the location of the community gardens, food pantries, and farmers markets in relation to the areas of LI-LA to grocery stores by bus (see Figure 3). With a 0.25-mile walkable buffer around these food access points, we found that they assisted an extra 537 people out of the 6,015 people (9%) within the areas of LI-LA (Figure 4; see light green areas for improved access to healthy food options within low-income areas). With the addition of these alternative healthy food resources, 5,478 people (91% of LI-LA) are left without access to healthy food options (almost 7% of the total city of Kalamazoo).

We then looked at food retail stores which promote unhealthy eating—convenience stores, corner stores, and dollar stores (Xin et al., 2021). We will refer to all of these mentioned unhealthy food access points as convenience stores. We identified 31 convenience stores by the NAICS classification within the City of Kalamazoo and

Figure 3. Grocery Store Access via Bus Routes in Kalamazoo, Michigan

Grocery stores were classified using the NAICS classification system and were mapped in red. All bus routes within the City of Kalamazoo were mapped with a 0.25-mile buffer in gray. The 0.25-mile buffer indicates walkability to and from a bus route. Low-income tracts (census tracts in the city that fell below the 2018 median income) are depicted in beige.



within a 0.25-mile distance outside of the City of Kalamazoo (Figure 5).

Of these retailers, 25 convenience stores with 0.25-mile walking buffers fell into low-income tracts (81%). We compared low-income and medium and high-income tracts and their access to convenience stores. Of the 53,845 people within the low-income tracts, 14,446 people (27%) fall within a 0.25-mile walkable radius of a convenience store, compared to only 2,336 (12%) of the 26,202 people in medium to high-income tracts. We also compared access to grocery stores between low-income tracts and medium to high-income tracts. Of the 26,202 people that fall into medium to high-income tracts, 1,443 people (6%) fall within a 0.25-mile walkable radius of grocery stores, compared to 6,296 of the people (12%) who fall in low-income tracts with access to grocery stores.

Discussion

This study reveals some important insights into food access in our city. First, we found that only 11% of residents in low-income census tracts do not have access by public buses to full-service grocery stores. In the City of Kalamazoo, all grocery stores fall within a 0.25-mile walkable radius of the bus routes. Households who use or qualify for food assistance programs like SNAP are more likely to rely on public transit, walking, or a ride from a friend or family member to get their

Figure 4. Map of Areas with Low Income and Low Access to Grocery Stores with Community Gardens, Food Pantries, and Farmers Markets

The low-access areas are based on the low-income areas outside the 0.25-mile buffer of Figure 2 and are shown in darker green. Alternative points of food access were mapped. A 0.25-mile buffer around these alternative food access points was mapped, and the low-access areas that overlapped with these points are shown in light green.

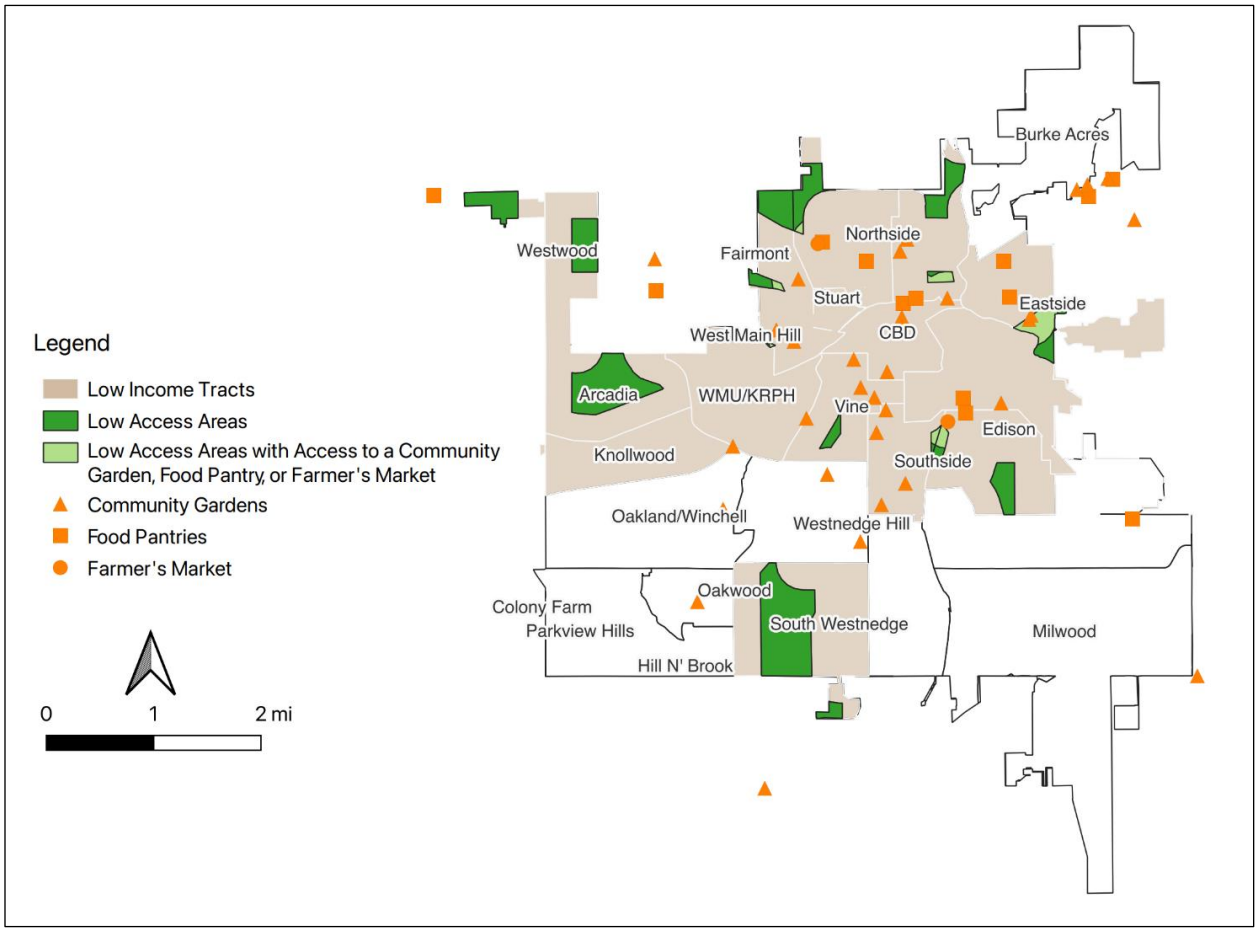
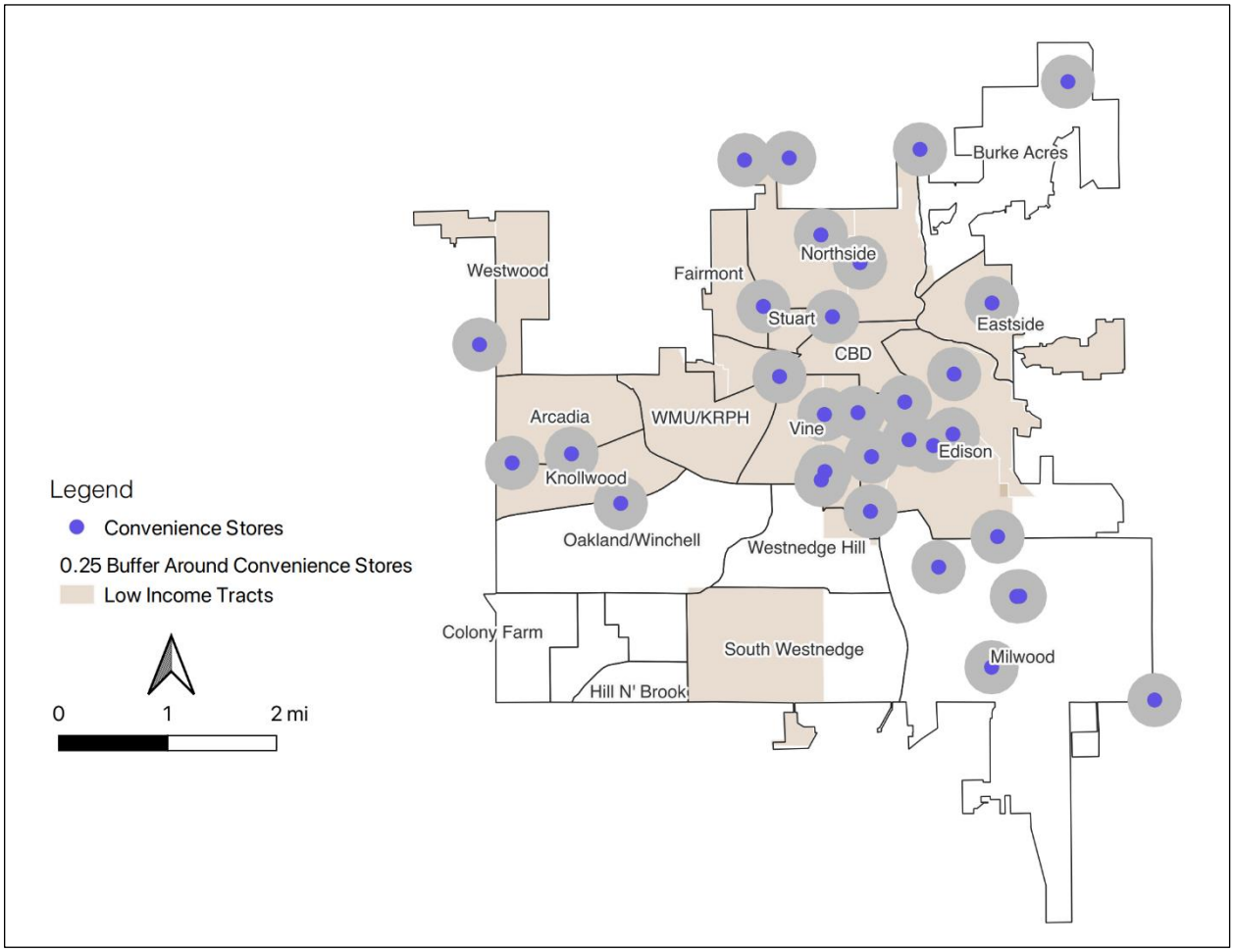


Figure 5. Map of Convenience Stores with 0.25-Mile Buffer in Kalamazoo, Michigan

Convenience stores classified through the NAICS classification system were mapped in purple with a 0.25-mile buffer shown in gray. Low-income tracts (any tract that fell below the 2018 median income of $44,296) are shown in beige.



groceries than more well-off residents. A USDA survey found that 68% of SNAP recipients drove their own car to the grocery store compared to 95% of households who earn too much to qualify for these programs (Schmitt, 2015). Although households who qualify for or collect food assistance benefits sometimes must rely on other means of transportation besides their own car to get their groceries, most people do not use public buses to get to the store, regardless of income (Jiao et al., 2011; Ver Ploeg et al., 2015).

Our case study looked at possible ways for Kalamazoo residents to get to the nearest grocery store, either by car, walking, or bus. The lowest income tract (Tract 15.04; composed mostly of Western Michigan University students) had nearly double the amount of driving and walking time compared to the highest income tract (Tract 12). Overall, there was no difference in driving or walking time between the second lowest income tract (not university students, Tract 9) and the highest income tract (Tract 12). This case study, using random points within tracts, may not capture the most prevalent patterns of transportation to the nearest grocery store in low-income compared to high-income tracts. Future studies should incorporate interviews that can more clearly assess the ways people get to food access points.

While supermarkets are the major grocery resource for U.S. households, the availability of

other healthy food options has increased (Ma et al., 2018; USDA, 2022a). Other points of healthy food access include community gardens, food pantries, and farmers markets, which provide additional access to healthy foods, but are seasonal and often unreliable, meaning that families cannot always count on them for weekly needs (Du Toit et al., 2022). Furthermore, not all residents feel a sense of belonging at farmers markets. For example, Russomanno and Tree (2021) found that shoppers who received SNAP benefits reported feeling excluded at farmers markets. We found that in the areas of low income and low access to grocery stores by bus (LI-LA), these seasonal food resources added little additional access, only aiding an extra 9% of low-income residents. We suggest that these permanent and nutritious access points, particularly food pantries, could be better placed in low bus route access locations.

The proximity to food retailers influences where and how people shop. Limited access to healthy food options like grocery stores can result in residents relying on smaller stores like convenience stores (Ver Ploeg et al., 2015). In this study we included dollar stores, which have greatly expanded nationally (Dollar General, Dollar Tree, and Family Dollar), gas stations, and corner stores in our definition of convenience store because all of these retailers stock foods that tend to be higher in calories and lower in nutrients, and also lack fresh produce (Xin et al., 2021). Households that are low income with limited access to grocery stores are more likely to spend more money at convenience, dollar, and drugstores compared to households with easier access to grocers (Ver Ploeg et al., 2015). In Kalamazoo, we found that the residents within the low-income areas had more walkable access (defined as a 0.25-mile radius) to convenience stores (27%) compared to medium to high income residential areas (12%). This difference aligns with past research and highlights that convenience stores tend to be found in low-income areas within Kalamazoo. Residents in low-income tracts are less likely to own a car (Rhone et al., 2017), and, therefore, may purchase food at a more conveniently located retailer with less healthy food options.

Disparities in access to food among census tracts are a great concern because access influences dietary choices, which in turn influence rates of obesity and other chronic diseases. Research has suggested that residents with better access to grocery stores and limited access to convenience stores have healthier diets and less risk of obesity (Larson et al., 2009; Rose & Richards, 2004). Reduced access to healthy food choices for low-income households is linked to poor diet quality (Ziso et al., 2022).

Other barriers to sustainable food access consist of lack of nutritional and culinary education, kitchen access, and time spent shopping and cooking meals (Soliah et al., 2019; Wolfson et al., 2019). Education around food security through nutritional education and peer education, community-based participatory research, and policy changes in supplemental nutrition programs can help to create better access to food. An example of this can be seen through the creation of meals with a variety of seasonal fruits and vegetables purchased from affordable farmers markets (Ziso et al., 2022). Acknowledging areas of low food access as we have done in Kalamazoo is the first step toward improvement. City planners can help regulate placement of convenience stores while appealing to more permanent grocery stores using tax breaks or other incentives. Cities can also increase the well-being of residents by sponsoring education programs about food (Ziso et al., 2022) and by facilitating the placement of more permanent food access points with healthy food options in these LI-LA areas.

We recognize that our study does not incorporate interviews. We made assumptions based on previous literature to understand barriers to food access in our city. Interviews with the local residents and with leaders of community gardens, farmers markets, and food pantries are necessary to fully understand the story of food access in Kalamazoo. Future work should incorporate such qualitative research to better understand how people get their shopping done, and whether these habits vary based on census tract and income. We did not account for the presence of barriers to access from infrastructure such as graveyards, parks, and school campuses in our analysis, instead assuming that census tracts were homogenous with adequate

well-maintained sidewalks. We also recognize that the realities of mid-western winters might seriously change food shopping habits. Our analysis was strictly geographic in nature and did not incorporate processes or policies that may ameliorate or exacerbate lack of food access. For example, during the COVID-19 pandemic, many food pantries delivered meals to families, and many services now exist for door-to-door deliveries. Future studies might investigate how different household income levels take advantage of such delivery services, as well as look into the public-school nutrition programs, which may supplement food access for families with children.

A lack of access to food is not natural (as the term "food desert" can imply), but the result of historical and persistent economic and structural actions such as redlining, transportation planning, zoning, and other city planning decisions (Kotval-K et al., 2021; Zhang & Debarchana, 2016). In the City of Kalamazoo, bus routes provide wide access to grocery stores; likely the stores were sited on widely used transportation corridors when they were established in the late 20th century (Shultz-Purves, 2013). Using geography only, we have identified areas within the City of Kalamazoo where 7% of the population has no easy access to healthy foods. We have also shown that these same areas have the easiest access to highly processed, less nutritious foods via convenience and dollar stores. We hope that community leaders, working with city planners and residents, can focus improvements to food access infrastructure in these areas.

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Farming for sociologists: A new key text for rural sociologists

Book review by
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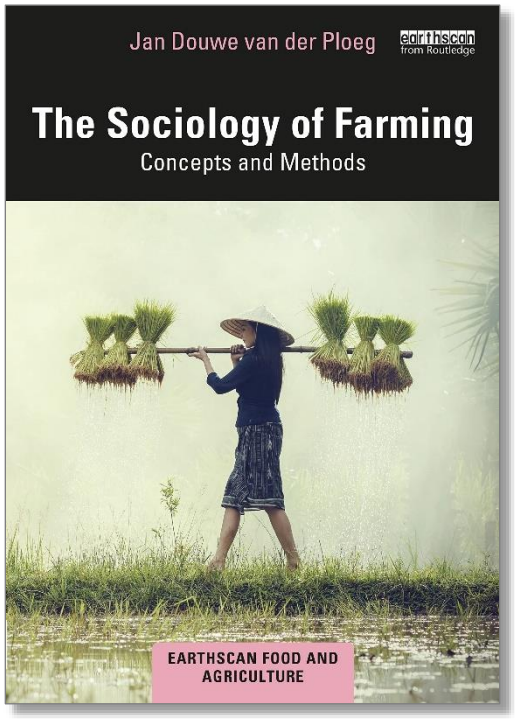

Review of *The Sociology of Farming: Concepts and Methods* (First edition), by Jan Douwe van der Ploeg. (2022). Published by Routledge. Available as hardcover, paperback, and eBook; 326 pages. Publisher's website: https://www.routledge.com/The-Sociology-of-Farming-Concepts-and-Methods/Ploeg/p/book/9781032321875

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"What is farming for? What are the objectives? How should it relate to nature and wider society?" (p. 121) asks Jan Douwe van der Ploeg in his new book, *The Sociology of Farming: Concepts and Methods*. As an accomplished interdisciplinary scholar making significant contributions to the fields of rural sociology, agroecology, and peasant studies, van der Ploeg offers emerging and seasoned scholars alike an overview of the wide array of challenges and opportunities in contemporary agrifood systems research.

Examples of applied, interdisciplinary, and creative methodological approaches make for an accessible, structured reading experience that thoughtfully guides the reader through rich and substantial content. Chapter by chapter, readers are routinely asked to orient themselves to questions of power, particularly when presented with what is "right" in agriculture. Through discussions of rural development, market dominance, and peasant struggles, the text provides a critical foundation for future study directions.

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The concept of co-production—an "ongoing encounter, interaction and mutual transformation of man and living nature" (p. 2)—guides van der Ploeg's examination of the social structures that shape farming practices and the ways in which farmers are tied to their land through connections to communities, economies, policies, and cultures. This co-production framework motivates the sociology of farming as a study "urgently needed [for] changes in agricultural sciences" (p. 45) and serves as a "vehicle for change" (p. 288) so desperately needed to resist the forces of capital. Van der Ploeg asserts that production at the intersection of farmers and nature necessitates the inclusion of farmers' social realities and epistemologies. Drawing from this stance, the co-production model positions farmers' knowledge as legitimate (p. 31)—a perspective that gives emerging rural sociologists clear conceptual guidelines to support applied and community-engaged scholarship.

However, the book is not without limitations. Notably missing (especially from an American lens), is a meaningful discussion of race and Indigeneity, particularly in the context of land access. And while van der Ploeg considers the role of women in farming and the long-standing history of devaluing women's contributions to agriculture (pp. 106–108; 260), gender is presented narrowly (e.g., farming women are referred to as "farmers' women" and situated in the "background" of the agricultural process [p. 10]).

These absences are important when the crux of this text challenges mainstream ideas about what the study of agriculture is and how it ought to be done. Of course, van der Ploeg cannot, and does not, claim to be able to include all topics of interest or concern within the field. Rather, his aim is to provide a sample of theoretical and methodological tools for readers to pursue those topics themselves. And yet, for an ambitious book like this to leave normative claims untouched seems lacking, especially in the current critical context.

For example, van der Ploeg acknowledges the unique position of agricultural workers as a "third class" who operate in a "non-capitalist segment of the capitalist society" (p. 24), but he does not significantly delve into the tension this creates as farmers *do* generally exist in a capitalist society. He goes on to assume the family farm as the "best" model for co-production because "the notion of profit becomes irrelevant" (p. 25). This runs contrary to a central "duty" of the sociology of farming that, according to van der Ploeg, is to reckon with the fact that since agriculture is dynamic across time and space, we must explore the many possibilities and perspectives of what "optimal" farming might be (pp. 152–153).

To point to family farms as the most ideal farming model without discussion of race and gender undervalues the labor of women and ignores questions about land acquisition and holdings. Relations of capital are not absent on family farms, as van der Ploeg suggests (p. 25). The family farm works as a third class because labor is not "paid." Yet capital is acquired, at least in some part or potentially, through racialized and gendered forms of oppression. While the family farm does not have wage workers, realized ownership and labor demands are not shared equally. Further, access to family farmed land is not neutral. While family farms throughout history have been the outcome of many emancipatory struggles, they have also been the impetus for dispossession and oppression. The sociology of agriculture ought to interrogate if the family farm remains—or ever has been—the best mode for a balanced system of co-production.

A thorough consideration of power in agriculture must include an ongoing engagement with environmental justice, gender, and race scholarship. While this literature is not sufficiently included, van der Ploeg does give readers tools to raise these challenges themselves through a plethora of methods and conceptual text boxes that offer ideas, ask questions, and point to exciting areas of growth in agrifood systems research. This in itself is an accomplishment as meaningful as addressing the various potential challenges to the text's normative assumptions. *The Sociology of Farming* spells out the importance of a sociological perspective of farming and champions the call for methodological creativity. It is as inspiring as it is critical—an important read for every rural sociologist, agroecologist, and agrifood systems scholar.

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Finding justice in the food movements

Book review by
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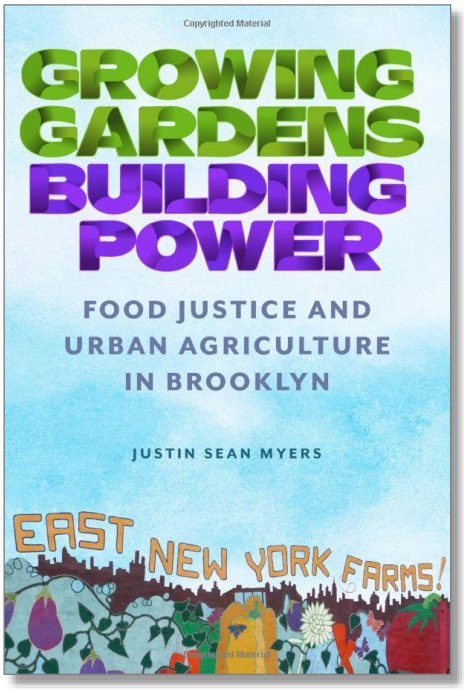

Review of *Growing Gardens, Building Power: Food Justice and Urban Agriculture in Brooklyn*, by Justin Sean Myers. (2022). Published by Rutgers University Press. Available as cloth, paperback, EPUB, and PDF; 250 pages. Publisher's website: https://www.rutgersuniversitypress.org/growing-gardens-building-power/9780813589008

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Justin Sean Myers' *Growing Gardens, Building Power: Food Justice and Urban Agriculture in Brooklyn* documents the emergence and development of urban agriculture in East New York. Using food as a lens, the book presents a detailed account of a community's collective effort to confront its racialized history of segregation and disinvestment and simultaneously fight for food sovereignty and social justice.

The first chapter provides an overview of the landscape in East New York, setting the tone for the rest of the book by pointing out the white, affluent, and exclusive status quo of the current food movement—one that fails to recognize the assets and needs of marginalized communities. The chapter advocates for a new discourse that not only addresses the intersectionality between the food movement and the "broader social, political, and economic structures and institutions" (p. 14), but also integrates a narrative of procedural, substantive, and distributive justice (p. 16). Building on these notions, chapter 2 examines the social, political, and economic roots of food inequities in East New York, detailing the institutional practices over the past century that have limited working-class communities of color through the systemic underdevelopment of housing, education, employment, and the discriminatory enforcement of criminal justice.

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In direct response to some of these policies and programs, the emergence of community gardens and, consequently, farmers markets in East New York are documented in chapters 3 and 4 as bottom-up initiatives that bring fresh produce to the local community at affordable prices. In exploring the role of food assistance programs in the farmers markets, Myers again stresses the urgency of establishing a counternarrative that prevents the stigmatization of such programs, calling for collective responsibility to achieve a social equity politics.

Looking specifically at East New York Farms! (ENYF!), a local organization that has long played a role in developing urban agriculture and youth programs in the area, chapter 5 discusses the limitation of the current funding streams in the food justice movement, which could be improved through a shift toward tax-based public funding to give local organizations more agency and, ultimately, to reshape the philanthropic funding landscape. Drawing on Walmart's failed attempt to expand to East New York, chapter 6 explains the importance of demand-side politics in addressing food inequities, especially the focus on creating high-road jobs in the local community while providing healthy food access. This leads us to the last chapter, in which Myers summarizes the six major issues previously touched upon in the case of East New York that shape the broader food justice movement: the conceptualization of food inequities, right to the land, social and economic welfare, work ethics, affirmative practices, and labor politics.

Growing up and living in affluent, predominantly white communities (p. 157), Myers never shies away from his positioning as an outsider to East New York. The book begins with Myers leaving his apartment adjacent to Prospect Park, a location that grants him convenient access to the "the flagship Brooklyn farmers market" (p. 2), an epitome of the white, affluent, and exclusive food movement that he sets out to criticize. We then follow him along the 3 train, going all the way to the end of the line to East New York where there is another farmers market—or rather an entire foodscape—that differentiates itself from the above and is simultaneously marginalized by it.

This short journey provides a geographical understanding of where East New York is within New York City as much as a sense of distance from it, not only to Myers, "a nonlocal white male" (p. 159), but also a potentially privileged readership, including myself. To avoid imposing an othering gaze and reproducing power inequalities, Myers volunteered at ENYF!, working on "building relations with the gardeners and staff members" (p. 159) for approximately a year before formally conducting interviews with them. Although the book targets an audience of academics and policymakers, *Growing Gardens, Building Power* draws on a considerable number of direct quotes from residents and ENYF! staff members, allowing the people to speak for themselves. This methodological approach shows remarkable congruence with Myers' aim to include the residents, particularly those in working-class communities of color, in the structure of decision-making and to secure their rights to food and the city. In this sense, the book's opening has another connotation, that is, the possibility and necessity for us all to come closer, one stop at a time, to underserved and underrepresented neighborhoods—a move that marks the beginning of the joint effort of academics, grassroots organizations, and local communities as we work toward more inclusive and just food systems.

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Can you have it your way? The consequences of racial capitalism in fast food in America

Book review by
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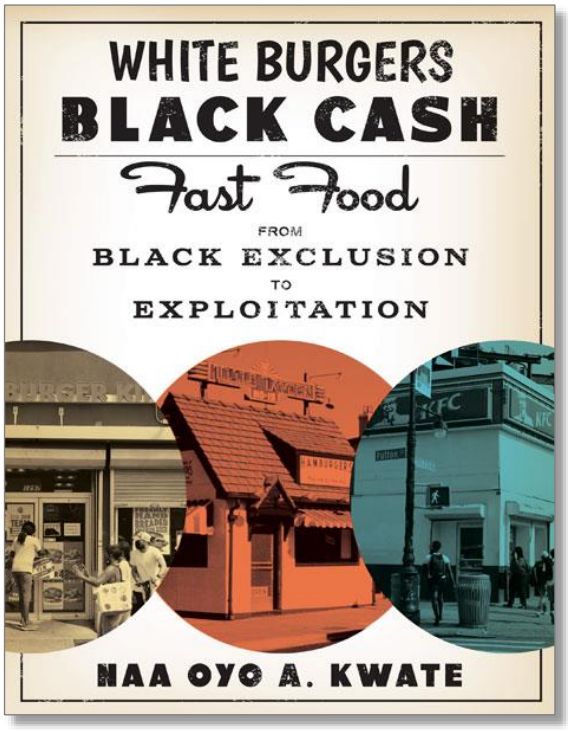
University of Wisconsin-Madison



Review of *White Burgers, Black Cash: Fast Food from Black Exclusion to Exploitation*, by Naa Oyo A. Kwate. (2023). Published by University of Minnesota Press. Available as hardcover and Kindle; 472 pages. Publisher's website: https://www.upress.umn.edu/book-division/books/white-burgers-black-cash

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White Burgers, Black Cash deftly traces the intertwined history of fast food, race, and capital in America. The goal of this monograph is to chart the racial and spatial pathways fast food has traveled, from its genesis in the early twentieth century to the contemporary moment—where it has become heavily concentrated in Black communities. From the onset, Naa Oyo A. Kwate sets the tone for the rest of the study, stating, "Fast food has always been a fundamentally anti-Black enterprise" (p. xiii). The introduction shows how the anti-Blackness of fast food goes beyond health disparities, and instead is rooted in the subordination of Blackness throughout history. The book sets out to outline the history of fast food's color line, with an emphasis on three cities: New York, Chicago, and Washington D.C. The book is segmented into three major sections: "White Utopias," "Racial Turnover," "Black Catastrophe."

In "White Utopias," the history of what is re-

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ferred to as the "first and second generation of fast food" is told, with reference to the first restaurants that established the culture of fast food in America. This first section emphasizes the Whiteness of these initial restaurants, noting that the names (e.g., White Castle), the staff, the neighborhoods in which they were located, and even the bread adulated and prioritized Whiteness. The section goes on to expand on the ways Black people were excluded from these spaces as patrons, staff, operators, and owners.

The second and third chapters demonstrate how fast food restaurants avoided Black space by placing their restaurants in areas where Black customers could not be reliably served. As fast food moved to the suburbs, Kwate argues that it continued to espouse a racial logic in which Black people were not welcome in the suburban oases created to advance the American dream. Fast food companies sought to escape what they understood as the fraught space of urban areas—simultaneously dodging Black clientele. Respectability politics proved to be a force that meant that, although fast food was not readily available to Black patrons, it was not welcomed unequivocally, either. Part of this ambivalence was due to scholars who espoused dietary modification as a means of racial progress. Avoidance of fast food could be used as a tool to bolster respectability in Black families. It was thought that eating appropriately could "discipline their bodies for political purposes" (p. 42). W. E. B. Du Bois and Booker T. Washington were among the Black scholars who encouraged Black people to attain racial progress through avoidance of unhealthy foods and "knickknacks" (p. 42; referring to cheese, crackers, desserts, and pork). "White Utopias" convincingly charts an argument that reorients the assumption that Black people lacked the taste and self-control required to resist fast food. Instead, Black people were excluded from fast food and were included only once it became profitable.

The second section, "Racial Turnover," expertly details how real estate, capital, and the object of celebrity were used to further subjugate Black communities. This section demonstrates the shift into what is called the "second generation of fast food" wherein fast food companies began to see urban centers as problematic, thus favoring White, suburban locales. However, the second-generation fast food chains began to encounter regulatory and community challenges to the installation of new fast food restaurants in the suburbs; unsurprisingly, their attention turned back to urban centers. Once fast food chains realized that there was money to be made off Black communities, there was an influx of locations popping up and advertising dollars being spent catering to Black customers. "Racial Turnover" illustrates the willingness of corporate fast food chains to offload financial risk to black operators.

The final section, "Black Catastrophe," details the disastrous consequences of fast food's racist legacy on Black communities up to the contemporary moment. From their exclusion from fast food spaces in the 1960s, to their subjugation and exploitation in the '70s and '80s, this section emphasizes the shift in the purpose of fast food, that is to say, the shift from fast food as a simple business to fast food chains using real estate as a means of territorial demarcation. Fast food's cultural imagery began to shift from that of Whiteness to that of Blackness. Fast food's expansion into Black spaces was facilitated by the systemic racism that kept real estate values where Black people lived low. This allowed fast food chains to spread into Black communities despite contestation.

The argument of this section can be summed up as it is articulated in Chapter 12: Black urbanites became casualties of the war between fast food chains in the corporations' attempts to secure capital. Fast food chains were sure to take advantage of the increased poverty and joblessness, and the crack cocaine epidemic of the '80s. To borrow a term from Kwate, the effects of this "Blaxploitation" in fast food are still seen and felt in the current day. "Black Catastrophe" presents the third and current "generation" of fast food—a gentrified version of fast food that uses clever marketing and celebrity endorsements to its advantage in order to continue attracting customers. Recent examples include female rappers Saweetie and Megan Thee Stallion featured in McDonald's and Popeyes commercials and social media campaigns, respectively.

In the book's conclusion, the contempt shown for Blackness through the medium of fast

food is sharpened to a knife edge. This is achieved by reiterating how fast food controls territories, segregates markets, and extracts resources, all to the detriment of Black communities. The narrow definition of fast food employed in this book—limited almost exclusively to fried chicken and hamburgers—creates a more focused argument in regard to the cities presented; however, the consideration of the full scope of fast food across diasporic communities in the U.S. may complicate the arguments presented in the book.

While not stated as a primary goal, this book offers little in the way of potential policy changes or solutions to abate the ravaging of Black communities via fast food. That being said, *White Burgers, Black Cash* is critical reading for those interested in the racialized histories of food and the interactions of capital, race, space, and consumer culture. Additionally, it should be required reading for any food historian, or food studies scholar.

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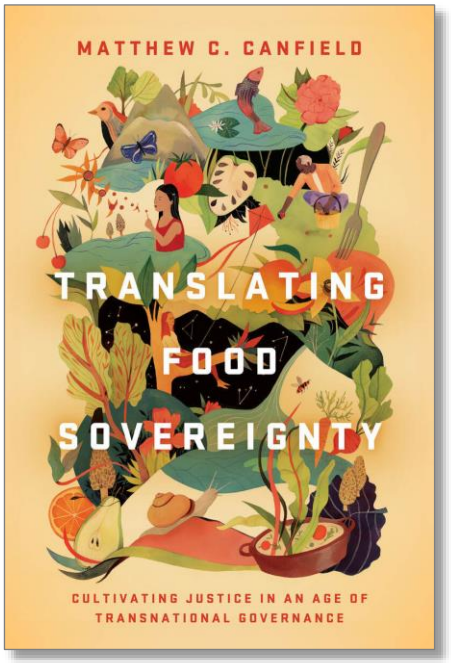
Nourishing hope: Unraveling the path to justice in the global food system



Book review by
Mallory Cerkleski *
Pisa Scuola Normale Superiore

Review of *Translating Food Sovereignty: Cultivating Justice in an Age of Transnational Governance*, by Matthew C. Canfield. (2022). Published by Stanford University Press. Available as hardcover, paperback, and Kindle; 280 pages. Publisher's website: https://www.sup.org/books/title/?id=32739

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In an era marked by widespread food insecurity and escalating concerns about climate change, *Translating Food Sovereignty: Cultivating Justice in an Age of Transnational Governance* by Matthew C. Canfield offers a timely and thought-provoking analysis of the global food system. Canfield explores the emerging food sovereignty movement, which challenges the dominant agro-industrial model and advocates for local and democratic control over food systems. As the reader progresses through the book, it becomes evident that Canfield embodies the essence of both a generalist and a specialist. With a wealth of experiences spanning from "formal" to "informal" and encompassing both legal and practical dimensions, each perspective presented feels remarkably comprehensive and worthy of serious consideration.

The food sovereignty movement originated in 1996 from members of Via Campesina, an international organization representing peasants. It emphasizes three main points: "Self-representation by peoples movements, a commitment to local and

* Mallory Cerkleski recently graduated with her MA from the University of Gastronomic Sciences (Pollenzo, Italy), where she focused her studies on the intersections of food, history, anthropology, and politics. Her research focuses on the perceptions of food systems and food distribution in socialist/post-socialist states as well as broader topics of food sovereignty, food justice, and food movements specifically with a decolonial or post-colonial lens. She is now pursuing her Ph.D. in history at Pisa Scuola Normale Superiore. She can be contacted at +1-305-509-2957 (WhatsApp) or mallory.cerkleski@gmail.com.

Indigenous forms of knowledge, and the promotion of autonomy within food systems" (p. 19). Canfield's research delves into contemporary calls for food sovereignty amid the rise of corporate-driven governance models facilitated by neoliberal globalization. The result: *governance from below*. While some may consider such ideas utopian, Canfield's work challenges this perception and demonstrates that justice and systemic change exist within a tangible domain.

Within the realm of legal anthropology, scholars have generally explored how international human rights gain practical significance in diverse local contexts. In this vein, Canfield's approach aligns, but with a particular focus on the strategies employed by social movement actors. He emphasizes their efforts in articulating claims of justice and creating networks that challenge neoliberal forms of governance on a transnational scale, showing the power and potential of collective action in driving change.

Canfield uses a strong theoretical approach, with each concept being paired with extensive fieldwork case studies. The theoretical concepts start with the main point of the book, which is "translation." Canfield argues that food sovereignty can be understood as a set of "social practices of translation" (p. 7). While Canfield points out other scholars' use of the term translation being "an interpretive process in which individuals and communities exercise power by constituting networks based on shared meanings, knowledge, and relations" (p. 18), Canfield suggests that there has not been a significant explanation of *practices* of such translation. Therefore, his contribution to the field is to show not just which, but how, these practices "serve as a form of mobilization in the blurred boundaries of transnational governance" (p. 19).

From this theoretical lens, we can follow Canfield's nuanced approach as he delves into historical perspectives to create contemporary meanings of food sovereignty for activists. He illuminates efforts to assert the food sovereignty principles laid out above across various levels of governance, encompassing the local, regional, and global domains. The book begins with his engagement with two organizations in Seattle, Washington. The initial three chapters focus on food sovereignty activism in the Pacific Northwest, providing a historical overview of alternative food activism in the region, including achievements like state certification of organic foods in the late 1970s. He then delves into the activist mobilization of food sovereignty frames from the late 2000s, particularly examining their involvement in a regional food policy council. Then, he explains his participation in an activist campaign supporting local farmworkers organizing within a multinational food brand's supply chain and "asserting greater control over their lives and labor and about working toward transformative change" (p. 118). As the book goes on, Canfield shifts his focus beyond the Pacific Northwest and follows activists as they embark on campaigns and form alliances on a transnational level. One of these campaigns shows activists challenging the promotion of commercialized food biotechnology, the Super Banana, in Uganda, while the other case explores the mobilization of food sovereignty movement frames within the United Nations' Food and Agriculture Organization's Committee on World Food Security. Canfield's insights lead the reader in the end "to understand that these activists were radically recalibrating their horizons of social justice and developing new practices of mobilization in response to the metamorphosis of capitalism and regulation in an era of neoliberal globalization" (p. 5). Despite the distinct settings, the book ensures contextual understanding by densely footnoting relevant scholarly literature, a notable strength of the work. However, readers may encounter some transitional complexities between the chapters as the author uses many different case studies spanning space and time.

In conclusion, this book adds much to the field of food sovereignty as a movement, as it not only uplifts the voices of the most marginalized, but shows the power they can possess in their collectivity. Additionally, it aids academics across disciplines by giving insight into new theories and methodological approaches. Until encountering Canfield's perspective, the literature surrounding food sovereignty appeared isolated and disconnected. Scholars tended to emphasize the term "food sovereignty" in the context of Latin America, while opting for different terminologies such as "food justice" in the United States (Motta, 2021).

Canfield's expertise in socio-legal studies and his deep engagement with the food sovereignty movement through detailed ethnographic research make this book a distinctive contribution to the field. It offers a new perspective on how different groups of people communicate globally and work together for a common goal, instead of the siloing effect some theorists have, ultimately providing a fresh and vital viewpoint.

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Appetizers in development economics

Book review by
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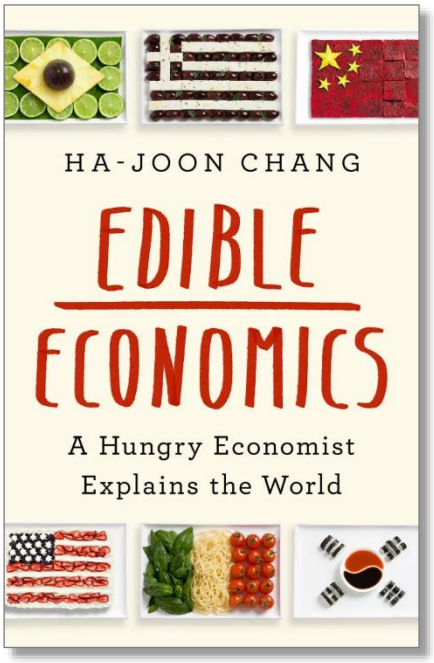

Review of *Edible Economics: A Hungry Economist Explains the World*, by Ha-Joon Chang. (2023). Published by PublicAffairs. Available as hardcover, paperback, and eBook; 224 pages. Publisher's website: https://www.hachettebookgroup.com/titles/ha-joon-chang/edible-economics/9781541700567/?lens=publicaffairs

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In *Edible Economics*, South Korean development economist Ha-Joon Chang argues against the neoliberal philosophy that "has normalized self-serving behavior" (p. xxii). He contends that the discipline of economics is a determinant factor in idea creation and in the organization of our lives, and therefore it is useful to understand how economic theory translates into reality. He also believes that a broad understanding of economics can help "make our society a better place to live for us and the coming generations" (p. xxiv). Food, the author admits, does not fit seamlessly into this objective and is instead a device to reel in the attention of the reader before expanding on development economic theory. The marriage between personal food stories and economics can sometimes feel disjointed; the reader may wonder how a chapter beginning with the history of rye leads to Otto von Bismarck's establishment of the welfare state. But, with Chang's palpable gregariousness, love of food, and general self-awareness, his essays succeed in making economics more "edible."

Chang's most compelling and trenchant arguments are critiques of the neoclassical and neoliberal conceptions of free-trade and freedom itself. Chang challenges the idea that economic freedoms are more important than social and political freedoms. Further, he argues that neoclassical economics tends to favor the proprietor class, with the freedom of others "at best ignored and at worst denounced as counter-productive" (p. 19). Only through restrictions on economic freedoms and in-

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vestment in social and political institutions, specifically "democratic constitutions, human rights laws, and legal protection of peaceful protests" (p. 19), can society create a more humanitarian economic system. In a chapter titled *Beef*, Chang continues to take aim at free-trade evangelism, invalidating the myth that the empires of the United States and Britain were built on free trade: "The US was a particular offender in this regard—it had average industrial tariff rates around 35-50% between the 1830s and Second World War" (p. 72). During this time, richer and more powerful countries employed protectionist strategies to grow "infant industries," while imposing free trade on developing countries through "unequal treaties," which "[deprived] them of 'tariff autonomy,' that is, the right of a country to set its own tariffs" (p. 71). This power dynamic persists today, Chang notes. Even with "formal equality" in the form of the World Trade Organization, rich countries can withdraw support from developing countries depending on their adoption of free-trade policies (p. 75).

Chang complements his commentary on free trade, a topic to which he dedicates three chapters, with a discussion of how countries increase their standards of living. He refutes the prejudice that "poor countries are poor because their people do not work hard" (p. 23). Using the coconut as a symbol for low-tech, cheap commodity–producing economies, Chang claims the opposite is true: workers in relatively poor countries tend to work much longer hours than their richer counterparts, but lack the technological advances that allow for rapid production growth. How do countries achieve those technological advances? The presence of natural resources could be one explanation, but exploitation of natural reserves historically has not been the harbinger for innovation and increased standard of living. Chang recounts the German invention of nitrogen fertilizer (and the consequential demise of the Peruvian guano market) to exemplify a country industrializing its way out of the "restrictions imposed on [it] by nature" (p. 37). He argues that this independence from natural resources—through capabilities wrought by industrialization and a strong manufacturing sector—is the foundation for long-term increases in the standard of living.

The book also includes intriguing discussions of care work, the welfare state, and equality. In examining these topics, Chang pushes the parameters of a typical economic discussion. He adds depth to the debate between equality of opportunity and equality of outcomes, noting that "Equality of opportunity is meaningless unless every member of society has the minimum necessary capabilities to make use of that opportunity" (p. 111). This flies in the face of both the left- and right-leaning positions, as both tend to ignore the needs and capabilities held by individuals, focusing instead on outcomes and opportunities. In a somewhat haphazard chapter titled *Rye*, he begins with a love letter to Agatha Christie novels and a short history of rye before describing the modern welfare state as "the most effective way of dealing with the inevitable insecurity that capitalism creates in its pursuit of economic dynamism" (p. 104).

Although a large majority of the book's essays are tightly wound and have insightful and satisfying conclusions, some are more speculative. In the chapter titled *Carrot*, Chang offers no definitive solution to the current patent system. Chang lists potential options to consider, such as a prize system, forced licensing of necessary technologies, or shortening the lifespan of patents, but does not clarify what a successful patent system resembles in practice. In another essay, titled *Lime*, he blames the "myopia of the private sector" for exacerbating the intractable problem of climate change, before declaring that "individuals can truly change the way they live when their pro-environmental choices are enabled by government policies" (pp. 131–132). This is passable and warranted, but most readers will have already heard this point of view, and the chapter's brevity makes it difficult to add anything insightful to the discussion.

Edible Economics is only nominally about food. The meat of Chang's commentary is not meat at all, but an anti-neoliberal take on arguments and concepts many economists do not consider. For students studying food systems, the book offers a suitable foundation for development economics and provides important historical and cultural context for the discipline. Chang's anecdotes about food are mouth-watering, but more impressive is his ability to make us hungrier for economics.