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On our cover: Like many local food venues around the U.S. and world, the Ithaca (New York) Farmers Market (<https://ithacamarket.com/>) moved quickly to enable sales to continue safely in early spring as the COVID-19 pandemic grew.

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Editorial

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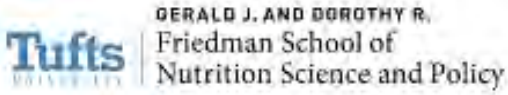




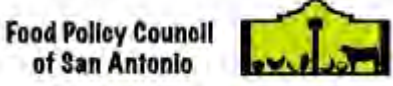




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IN THIS ISSUE DUNCAN HILCHEY

Open call papers and early responses to COVID-19



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**JAFSCD
Responds to
the COVID-19
Pandemic**



On behalf of the JAFSCD staff and community, I would like to extend condolences to anyone in the JAFSCD community—our shareholders—who have lost family members or colleagues during the COVID-19 pandemic. We are with you. We also wish anyone who has contracted the virus our best wishes for a speedy and full recovery, and hope for a better future for those whose lives have been turned topsy-turvy by the pandemic.

On May 26, 2020, the United States officially reported losing 100,000 individuals, many of whom were vulnerable to this plague—especially the poor, people of color, the elderly, and essential workers. This represents a moral and systemic failure for the world’s richest country. As Americans are cobbling together an assortment of food provisioning strategies, what we are witnessing is a demonstration of just how fragile American food security is in a time of crisis. However, as you’ll see in this open call issue, COVID-19 is also highlighting our strengths and creativity, and what we can build on in a future food system that contributes to our overall health, well-being, and social resiliency.

In response to the need for timely information, we are launching a year-long call for submissions on COVID-19 and the food system. We are fast-tracking for publication commentaries from researchers and Voices from the Grassroots essays from non-academics. In addition, we are calling for peer-reviewed papers to be submitted this fall (see details at <https://foodsystemsjournal.org/index.php/fsj/call-for-papers>).

On our cover: Like many local food venues around the U.S. and world, the Ithaca (New York) Farmers Market (<https://ithacamarket.com/>) moved quickly to enable sales to continue safely in early spring as the COVID-19 pandemic grew.

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We start out in this large issue with the first set of commentaries prepared in response to the COVID-19 pandemic, followed by two *Voices from the Grassroots* essays also on the subject.

Commentaries on COVID-19 and the Food System

Jane Kolodinsky, Marilyn Sitaker, Lisa Chase, Diane Smith, and Weiwei Wang provide a cup-half-full view of the pandemic and how our experience today may shape more resilient food system in the future in *Food Systems Disruptions: Turning a Threat into an Opportunity for Local Food Systems*.

Claudia Schmidt, Stephan Goetz, Sarah Rucker, and Zheng Tian use search engine data to explore consumption patterns in *Google Searches Reveal Changing Consumer Food Sourcing in the COVID-19 Pandemic*.

Rami Zurayk (former JAFSCD columnist) provides a sobering view of COVID-19's specific effects on the availability, access, utilization, and stability of food in the developing world in *Pandemic and Food Security: A View from the Global South*.

Jim Worstell explores the concept of community and food system resilience in terms of connectivity, local self-organization, innovation, maintenance/redundancy, accumulation of value-added infrastructure, transformation, ecological integration, and diversity (a.k.a. the "CLIMATED" model) in *Ecological Resilience of Food Systems in Response to the COVID-19 Crisis*.

Stephan Goetz, Claudia Schmidt, Lisa Chase, and Jane Kolodinsky explore the current pandemic's impact on farmers using USDA data in *Americans' Food Spending Patterns Explain Devastating Impact of COVID-19 Lockdowns on Agriculture*.

Finally, **Ella Haley, Susana Caxaj, Glynis George, Jenna Hennebry, Eliseo Martell, and Janet McLaughlin** give us as view of the fragility of Canada's food industry labor force in *Migrant Farmworkers Face Heightened Vulnerabilities During COVID-19*.

Voices from the Grassroots

In *Neighbor Leaves Program Aims to Maintain Regional Grain Value Chains and Feed the Community*, **Amy Halloran** described the efforts of an activist value-chain effort to quickly respond to the growing food crisis in the Upper Midwest during the COVID-19 pandemic.

In *Telefarming: When Push Comes to Shelve in Responding to COVID-19*, **Salina Brown** and **Kathleen Liang** provide a personal account of how one intrepid college research station employee and her faculty supervisor worked out a clever solution to keeping research plots alive during the lock-down.

Column

In his *Economic Pamphleteer* column, *Local Food: Another Food Fad or Food of the Future?*, **John Ikerd** reminds us that "the only sustainable food systems will be local food systems that reconnect people with particular ecological and social places."

Viewpoints

In *Just Transition for Agriculture? A Critical Step in Tackling Climate Change*, **Charlotte Blattner** argues for a thoughtful reduction in animal agriculture.

Next, as outgoing board president of the Society for Nutrition Education and Behavior, **Jennifer Wilkins** reflects on the need for nutrition educators to include the natural, social, and political environments in food choice decision-making in *Nutrition Education in the Anthropocene: Toward Public and Planetary Health*.

Julia Valliant and **Julia Freedgood** identify gaps in farmland transfers policies and call for an evaluation for their use and effects in *Land Access Policy Incentives: A Promising Approach to Transitioning Farmland to a New Generation*.

In *Blockchain and the Resurrection of Consumer Sovereignty in a Sustainable Food Economy*, **Jeff Schahczenski** and **Celia Schahczenski** envision a means of promoting transparency and traceability in local food systems.

Open-Call, Peer-Reviewed Papers

In *Government Extension, Agroecology, and Sustainable Food Systems in Belize Milpa Communities: A Socio-Ecological Systems Approach*, **Kristin Drexler** explores the value of slash-and-mulch production practices.

Next, **David Conner** suggests that food-related entrepreneurship education should focus more on “make or buy” decision-making, in his theory-driven exploratory study *Exploring Resource Management for Sustainable Food Businesses: Three Vermont Case Studies*.

In *Food Waste Knowledge, Attitudes, and Behavioral Intentions among University Students*, **Manar Alattar**, **James DeLaney**, **Jennifer Morse**, and **Max Nielsen-Pincus** find out why students waste food on campus and how this may be addressed.

Sarah Lott, **Emily Irwin**, and **Sarah Heiss** then examine the work of food gleaning professionals and the value of good communication and farmer altruism in *Gleaner-Farmer Relationships: A Study of Recruitment and Relationship Development*.

In *Farm-to-School Grant Funding Increases Children’s Access to Local Fruits and Vegetables in Oregon*, **Kristen Giombi**, **Anupama Joshi**, **Caroline Rains**, and **Jean Wiecha** find that farm-to-school programs also help increase minority children’s school attendance.

Next, **Aditya Khanal**, **Fisseha Tegegne**, **Lan Li**, **Stephan Goetz**, **Yicheol Han**, **Stephan Tubene**, and **Andy Wetherill** find that the more engaged limited-resource farmers are in their networks, the more they report increased sales, in *Small and Minority Farmers’ Knowledge and Resource Sharing Networks, and Farm Sales: Findings from Communities in Tennessee, Maryland, and Delaware*.

In *Gaining Ground: An Exploration into the Lives of Missouri’s Lesbian Farmers*, **Sarah Cramer** reveals the challenges for lesbian farmers in a conservative state, while finding that, overall, the case study participants had found empowerment and pride in their work, particularly in small-scale, sustainable agriculture operations.

Next, in *Connecting Small-Scale Producers and Consumers: Exploring the Feasibility of Online Food Hubs in Low-Income Communities*, **Michelle Kaiser**, **Kelsey Ryan-Simkins**, **Julia Dionne**, and **Erica Pence** come to grips with the reality of balancing producer and consumer needs.

In the latest Food Dignity entrée, entitled *Comparing Apples and Coconuts: Food Regimes and (Farmers) Markets in Brooklyn, USA, and Suva, Fiji*, **Christine Porter**, **Lacey Gaechter**, and **Shikha Upadhyaya** find common threads in Global North and South responses to the challenges of the global food system.

Next, **Mesfin Bezuneh** and **Zealelem Yiheyis** take a deep dive into resilience amidst hunger in the American Southeast in *Household Food Insecurity, Coping Strategies, and Happiness: The Case of Two Public Housing Communities*.

In *Integrating a Food Systems Lens into Discussions of Urban Resilience: A Policy Analysis*, **Patricia Ballamingie**, **Alison Blay-Palmer**, **Irena Knezevic**, **André Lacerda**, **Evelyn Nimmo**, **Lori Stahlbrand**, and **Rotem Ayalon** offer a reflective essay on their research collaborative’s efforts to bring food systems to the foreground of urban planning.

In *Advancing Ideas for Farmers Market Incentives: Barriers, Strategies, and Agency Perceptions from Market Managers*, **Cody Gusto**, **John Diaz**, **Laura Warner**, and **Paul Monaghan** explore the views of farmers market managers for potential improvements in subsidizing good food.

Patrick Mundler, **Daniel-Mercier Gouin**, **Sophie Laughrea**, and **Simone Ubertino** then explore the challenges of developing short supply chains in the context of government production controls in *Is Canada’s Supply Management System Able to Accommodate the Growth of Farm-direct Marketing? A Policy Analysis*.

Next, **Chris Maughan, Colin Anderson, and Moya Kneafsey** offer a systematic approach to evaluating farming-related policy documents in *A Five-Point Framework for Reading for Social Justice: A Case Study of Food Policy Discourse in the Context of Brexit Britain*.

In our final peer-reviewed paper, *Going Rogue for Raw Milk: Experience and Values as Consumer Filters for Conflicting Raw Milk Discourses*, **Sarah Heiss** and **Andrea Suozzo** put a spotlight on the knowledge, attitude, and behaviors of raw milk consumers as a means of informing public policy.

Reviews

Malory Foster reviews *Community-Scale Composting Systems: A Comprehensive Practical Guide for Closing the Food System Loop and Solving Our Waste Crisis*, by James McSweeney.

Anthony Fuller reviews *An Organic Food and Farming in China: Top-Down and Bottom-Up Ecological Initiatives* by Steffanie Scott, Zhenzhong Si, Theresa Schumilas, and Aijuan Chen.

Brian Raison reviews the documentary film *A Garden Experience: Growing Organic*, produced by Nancy Bentley and John Atkinson.

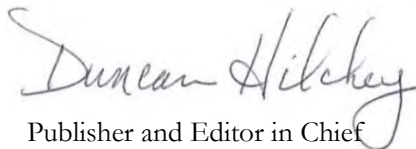
Renee Catacalos reviews *Black Food Geographies: Race, Self-Reliance, and Food Access in Washington, D.C.*, by Ashanté M. Reese.

Emily Reno reviews *Life on the Other Border: Farmworkers and Food Justice in Vermont*, by Teresa Mares.

Stacey Stearns reviews *In Defense of Farmers: The Future of Agriculture in the Shadow of Corporate Power*, edited by Jane Gibson and Sara Alexander.

Again, we wish to express our concern and sorrow for the JAFSCD community's losses and the continuing struggle during this catastrophe. Please let us know if there is *anything* we can do as a publisher of evidence-based information to address your needs and concerns. We are especially interested in fast-tracking practical information that can be helpful to front-line food producers, workers, researchers, and activists during this trying time.

With best wishes for health and resilience,



Publisher and Editor in Chief

COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

Food systems disruptions: Turning a threat into an opportunity for local food systems

**JAFSCD
Responds to
the COVID-19
Pandemic**



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Our food system has been disrupted. Shopping at a grocery store during the COVID-19 pandemic is not a pleasant experience, and, for some of the most vulnerable, it can be outright dangerous. It may become worse. How long will supply chain disruptions continue and what are upcoming challenges? From illness in the fields where agricultural workers pick our food and the closing of food processing facilities to the threat that trucking lanes may be shut down, the possibilities seem real right now. According to Zippy Duvall, president of the American Farm Bureau Federation,

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There's a lot of things that happen to the food before it gets to the consumer, whether it be in processing or transportation. If this thing was to get worse, what problems come along with that? None of us really know. (Shroetenborer, 2020, para. 4)

How will we feed ourselves?

There has been a spike in interest in local food, and corresponding growth in the number of local

food options (Low et al., 2015; U.S. Department of Agriculture [USDA], 2017). But, despite a growing demand for fresh, local food via community supported agriculture (CSA) shares, farmers markets, farm stands, and, yes, mail order, few Americans participate in the local food system. In Vermont, often looked to as a leader in local food systems, local food purchasing increased to 6.9% in 2014 (US\$189 million) compared to 5% in 2010 (Carter, 2017). Nationally, the USDA has reported that farms with local food sales represent 7.8% of U.S. farms, and local food sales account for an estimated 1.5% of the value of U.S. agricultural production (Low et al., 2015). But those figures include sales to institutions such as schools and restaurants, both functionally out of business due to the COVID-19 pandemic.

The pandemic, which is threatening not only human health but also the health of businesses, including farms large and small, has led, at least anecdotally, to both a business model change by farmers and a behavioral change by consumers. With restaurants and schools closed, American consumers are clearing grocery shelves faster than our industrial food system can keep up (Johnson, 2020). People are eating at home, which means more food in homes. Reports from around the country indicate that consumers are changing not only where they eat, but where they buy their food. For some farmers, this is a bright spot in the agricultural industry, even as we see some farms struggling (Yaffey-Bellany & Corkery, 2020). If changes in buying and eating habits persist beyond the pandemic, we may see hope for the expansion of local food systems. Indeed, a larger change in the way most Americans buy food has been needed to move local and regional food systems forward.

Three years ago, our team from the University of Vermont, The Evergreen State College, Washington State University, and University of California Cooperative Extension were awarded a grant aimed at getting fresh local foods to people who are unable or unwilling to participate in the local fresh food system. Whether they found it unaffordable, that those markets “weren’t their people,” or more inconvenient, we hypothesized that there must be a better way to provide access to fresh, local food to consumers, while supporting farmers and small local retailers. The Farm Fresh Food Box (F3B) project was born.

It had been several years in the making. Why not take the best of a CSA and make it “not a mandatory subscription”? What if farmers without enough to wholesale but an abundance of produce had a new place to sell it? What if this produce were available at local grocers in the community where consumers already shopped? We knew there would be some challenges. How do you develop farmer/retailer pairings that worked? Would consumers buy a box of produce at a reasonable price when they could not choose the exact contents?

Our team of researchers, Cooperative Extension educators, and students have provided solid support for the concept (Chase et al., 2017; Chase et al., 2019; Kolodinsky, 2017; Kolodinsky et al., 2019; Sitaker et al., 2017; Sitaker et al., 2018; Sitaker, McGuirt, Wang, Kolodinsky, & Seguin, 2019; Smith et al., 2017; Smith, Greco, Van Soelen Kim, Sitaker, & Kolodinsky, 2018; Smith, Wang, Chase, Estrin, & Van Soelen Kim, 2019; Van Soelen Kim et al., 2019). The model can work. Farmers earned a bit more income and did not have to staff a farmers market or be around for consumers to come to their farm. Small grocery and convenience store retailers potentially can sell more of other goods when consumers pick up their Farm Fresh Food Box. And, consumers were happy with the quality of the produce in the box.

While the consumers who purchased Farm Fresh Food Boxes were very pleased, this innovation in getting more fresh food to more people did not seem to take off. The number of boxes sold during the pilot was relatively small: 800 over two years in seven locations in three states. While Farm Fresh Food Boxes were less expensive than farmers market produce, the box came without choice and had to be pre-ordered. These barriers seem to be higher than the benefits of obtaining fresh produce and supporting the local economy. If consumers do not see a relative advantage, they will not buy.

But our world has become unhinged. Going to a supermarket and buying the produce from open shelves is no longer the convenient, “cheap” alternative. Local farms have come to the rescue in all three of the states where our project was implemented (Crampton, 2020; Northwest Harvest, 2020; Schmidt et al., 2020; Vermont Land Trust, 2020). CSA shares have surged, and some farm stands and farmers markets report skyrocketing sales (Ricker & Kardas-Nelson, 2020). National Farm to School partners are incorporating local food into emergency feeding programs, especially when existing relationships between schools and producers are already strong (Harris & Stephens, 2020).

When the COVID-19 pandemic is over and citizens return to a new normal, maybe that normal will include purchasing already boxed produce from trusted, local farmers sold through local grocers. Not only might people have access to fresher, local food, they will also be supporting their local farmers and contributing to the resilience of our food system. Even some proponents of industrial food and large scale production have stepped back. “To prepare for future disasters we might want to encourage food companies to have five or six food processing plants scattered around the countryside, rather than one giant regional plant,” says Jayson Lusk, an agricultural economist at Purdue University (Johnson, 2020, “What does this stress test tell us,” para. 2). That sounds hopeful in our current state of disarray and fear. Local farms are pivoting to serve their communities in a time of need. It is also time for consumers who are becoming more aware of where food comes from—and of the true cost of food—to contribute to sustainable, resilient food systems that will continue to support our local farms, long after this pandemic has ended.

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COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

Google searches reveal changing consumer food sourcing in the COVID-19 pandemic

**JAFSCD
Responds to
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Introduction

Consumers are dramatically changing their food purchasing habits in response to the evolving COVID-19 pandemic (Kolodinsky, Sitaker, Chase, Smith, & Wang, 2020; Schmidt et al., 2020; Worstell, 2020). In part this is due to growing public awareness that food supply chains, which normally operate largely unnoticed and with great efficiency, are in fact fragile and vulnerable. With supply chain interruptions and mandates in several states for social distancing and a reduced number of grocery shop trips, consumers are compelled to think about food storability as well different food sourcing options. In this commentary we examine how consumer interest has changed since the advent of the pandemic, by observing Google search trends. Google Trends analysis has been widely used to study health-related aspects of COVID-19 and earlier pandemics (Arora, McKee, & Stuckler, 2019; Carneiro & Mylonakis, 2009; Ginsberg et al., 2009; Mavragani & Ochoa, 2019; Mavragani, Ochoa, & Tsagarakis, 2018; Nuti et al., 2014), but to our knowledge not to track changing consumer behavior with respect to food sourcing

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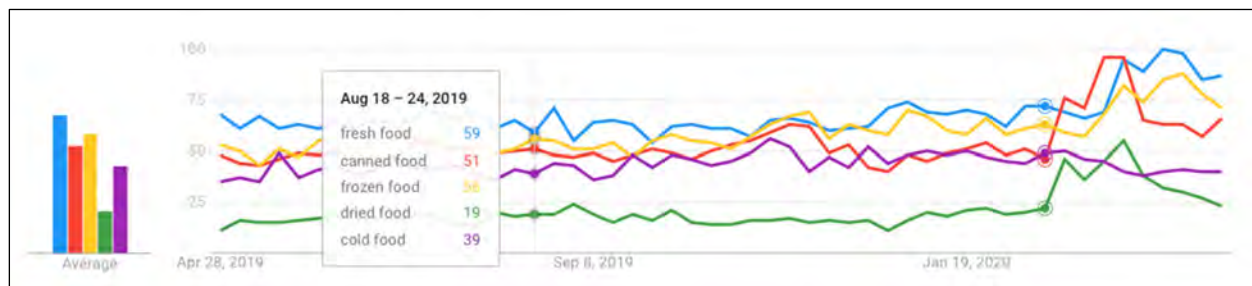
in real time.¹ We offer these comments both as potential real-time tracking of consumer preferences, as well as working hypotheses for future more vigorous investigations.

Google Trends² data can reveal not only what is preoccupying the public at a point in time, but also how that compares with preoccupations over the course of a year (i.e., year-to-year comparisons), as well as to other topics.³ In the case of the pandemic, Washington state was the first to declare a COVID-19–related emergency, on February 29, 2020, while California was the first to issue a stay-at-home order, on March 19, after having declared an emergency on March 4 (Kelleher, 2020; Mervosh, Lu, & Swales, 2020). In terms of national consumer interest or preoccupations, we are able to observe three fairly distinct periods in terms of food-related searches. First, a concern with food storage, starting the week of February 16–22 and continuing until mid-April, coupled with some evidence about concerns over food shortages (starting March 1–7). Second, starting the week of March 1–7, a growing interest in more local, direct options for acquiring food emerged, which continues to this day. Third, starting the week of March 8–14 and spiking a few weeks later (except for Grubhub), growing interest in take-out food and home delivery, as the stay-at-home orders became more widespread. This was also the week in which searches for food banks and pantries started to take off, just preceding the week of March 22, which saw record increases in initial jobless claims (3.3 million) (Trading Economics, n.d.).

1. Week of February 16–22: Consumers are concerned about storing food (and potentially hoarding).

With the looming pandemic, consumers became increasingly interested in storable basic food items, whether that food was fresh, canned, frozen, refrigerated, or dried (Figure 1). These searches started to rise during the week of February 16–22 in the cases of dried food and canned food, a period that also coincided with anecdotal evidence of empty shelves for certain food items, including beans, flour, and pasta. Searches on fresh food were gradually rising even earlier but jumped March 8–14, while in the case of frozen food the increase occurred the week of March 1–7. Interest in frozen food was also the last to spike, during April 5–11.

Figure 1. Interest Over Time: Food by Storage-Related Processing (last 12 months)*



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of Feb. 16–22, 2020.

* Note for this and the other figures: We capture Google search results directly as screenshots. In order to keep the graphs small while adding a legend, we use the feature whereby hovering the cursor over the lines on a certain data also provides a legend for the lines; this date is reported but arbitrary for present purposes. The dates that are relevant are shown as dots with circles and are closer to the right sides of the graphs.

¹ These searches are not without potential problems; for a summary discussion see:

<https://medium.com/@pewresearch/using-google-trends-data-for-research-here-are-6-questions-to-ask-a7097f5fb526>

² “Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough data for this term” (<https://google.com>)

³ Except where noted, the search is for the entire U.S. and for the last 12 months.

In terms of the distribution across states (Figure 1a), searches for fresh food tended to dominate in the eastern half of the U.S., except in West Virginia and Vermont, where canned food dominated, while frozen food was of greatest interest in Northern New England, Connecticut, and Ohio and selected and intermountain west states as well as Iowa. Canned food searches showed a similarly dispersed pattern, with Washington, Oregon, Montana, and a few other states standing out.

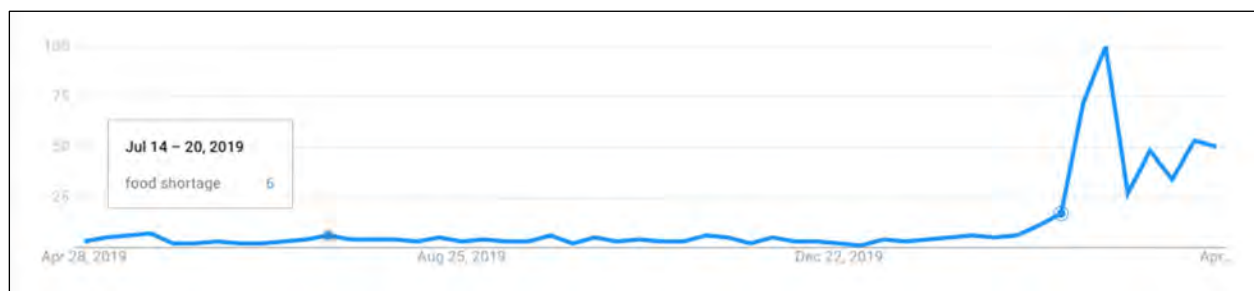
Figure 1a. Distribution of Prominent Search Terms by State



Source: Google Trends, April 27, 2020.

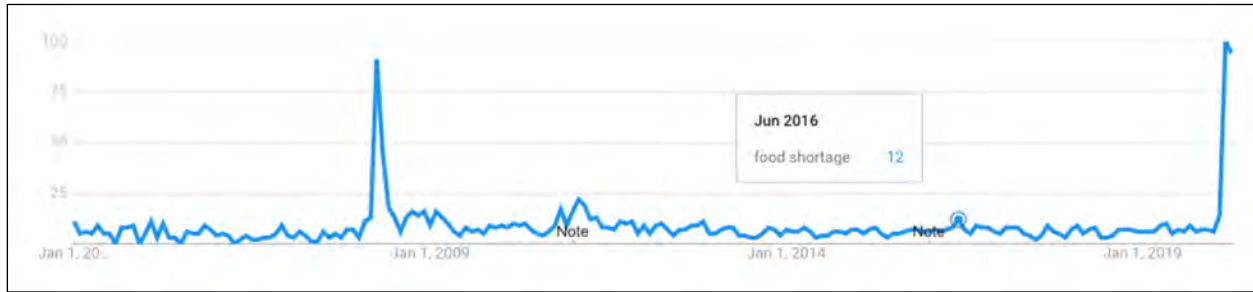
The notion that consumers were thinking about food shortages is confirmed by searches on this term, which dominated the individual food categories (Figure 1b) and remains high as of this paper's writing at 50% after spiking early on. The states of North Dakota, New Mexico, Montana, Idaho, and Utah dominated in search interest over this period.

Figure 1b. Search Interest for Food Shortage Coincides with Beginning of Pandemic (12 months)



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of March 1-7, 2020.

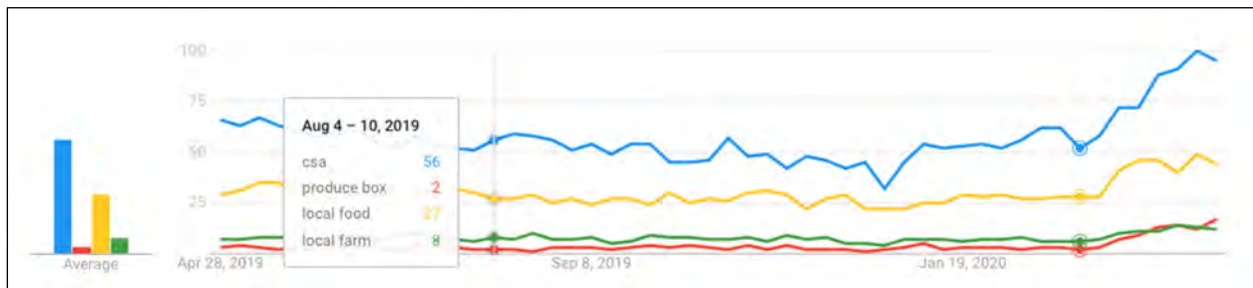
To put this one-year search pattern in perspective, Figure 1c shows the data since 2004. Subject to the caveat that the collection method and search function have changed over time, this figure suggests a slightly greater concern about or preoccupation with food availability in the current pandemic than was true in April 2008, the previous peak period of global food scarcity that was due to production shortfalls around the world (over the overall period for which data are available).

Figure 1c. The Long View of Search Interest in Food Shortage (2004–2020)

Source: Google Trends, April 27, 2020; the geography of search is the U.S.; The “note” labels mark when Google Trends made a change in the collection method.

2. Week of March 1–7: Consumers start to think about local options for sourcing food.

Along with the concern about the storability of different foods, consumers also started to look for other, more local sources of food around the first week of March. For community supported agricultural operations (CSAs), the searches had already been gradually rising since the beginning of the year as consumers sought to connect with farmers who were making early planning decisions for what to grow, reflecting normal season search patterns. Interest in CSAs were the highest in Vermont, the District of Columbia, Massachusetts, and Oregon. The terms *local farm* and *food* also enjoyed moderate search interest in this period. Searches for these terms have only recently peaked, and they continue to rise in the case of searches for *produce box*—mostly in North Carolina—as the harvest season accelerates.

Figure 2. Interest Over Time: Switching to More Local Direct Options

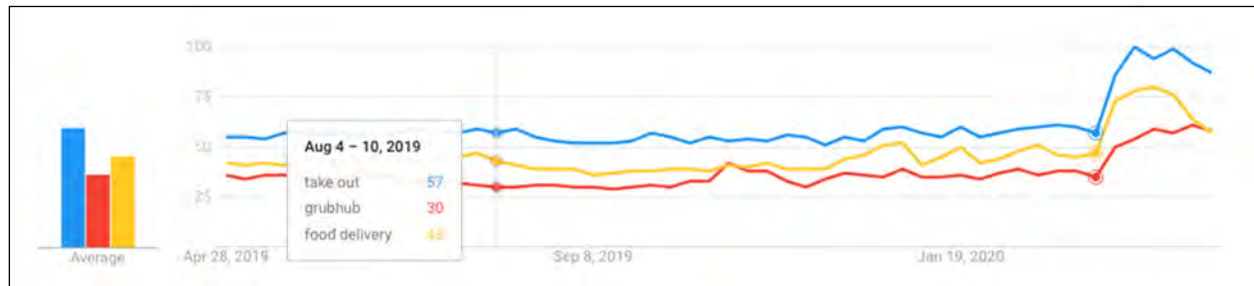
Source: Google Trends, April 27, 2020; circles to the right show week of March 1–7, 2020.

3. Week of March 8–14: With growing fears about the virus and shutdown orders, consumers look to takeout and delivery options.

About a week later, as consumers could no longer go to restaurants and with social distancing and shutdown orders in place, they turned to yet another food access option, with the terms *takeout*, *Grubhub* and *food delivery* each experiencing surging interest during the week of March 8–14. In these searches, food delivery could be from grocery stores as well as restaurants.

The terms *Uber Eats*; *Peapod* and *Instacart* show similar trends (with the latter having twice the search volume of *takeout*). It is also noteworthy that *Grubhub* is enjoying sustained interest even as the other terms are falling off in terms of interest. North and South Dakota and Delaware dominated in *food delivery* searches, while *Grubhub* was most prominent in Oregon, Utah, and Illinois.

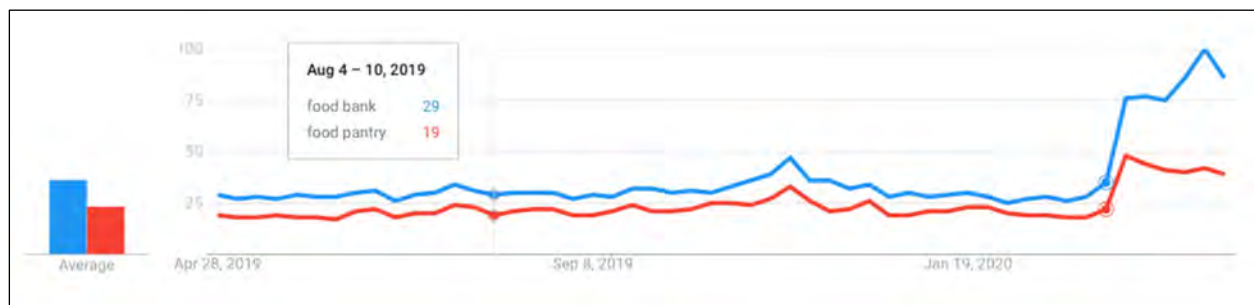
Figure 3a. Switching to Options Outside Restaurants (and Stores)



Source: Google Trends, April 27, 2020; circles to the right show week of March 8–14, 2020.

During March 8–14, as the first waves of layoffs started to occur, searches for *emergency food aid* also started to rise. The term *food bank* dominated in Washington, Montana, Arizona and Idaho. In some states, including Washington, the National Guard has been called in to support food bank operations, which are experiencing higher-than-ever client demand on top of shortages of food supply and workers (Kulish, 2020). For *food pantry*, Wisconsin, Illinois, South Dakota, North Dakota, and Missouri dominated.

Figure 3b. Rising Demand for Food Aid



Source: Google Trends, April 27, 2020; circles to the right show week of March 8–14, 2020.

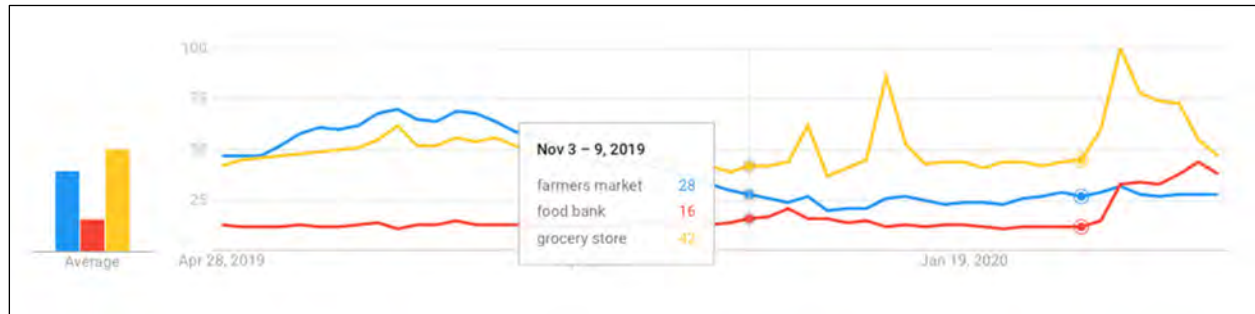
4. The broader, changing context of where food is sourced.

To place the above findings in context, we show search trends for *grocery stores*, *farmers markets*, and *food banks* over the course of the last 12 months (Figure 4). Even though consumers normally start to think about local options for sourcing food in the early spring, *farmers market* searches are lower (by about half) this year over the previous year, most likely because of social distancing concerns as well as orders prohibiting farmers market operations as non-essential in some states. Based on the patterns last spring (and earlier years—not shown), seasonal searches for *farmers markets* should be increasing at this time as consumers start to expect early spring harvests at least in some parts of the country. But this year, even as some farmers markets adapt (Schmidt et al., 2020) by using curbside delivery, etc., the searches remain low.

Grocery store searches are well above seasonal search patterns normally observed this time of the year, spiking noticeably on March 15, and slightly greater than searches around the end of year holidays of Thanksgiving and Christmas. This is likely because consumers are verifying store hours of operation (including special hours for senior citizens) or perhaps planning grocery trips in order to stock up on food. The latter would explain why the search intensity has declined recently to a level more similar to that of last year at this time.

As already noted, interest in information on food banks has increased sharply since the beginning of March in a relative sense. Normally such search demand rises only in the few weeks before Thanksgiving, but during the pandemic the volume is two to three times higher.

Figure 4. The Broader Context: Farmers Markets, Grocery Stores, and Food Banks

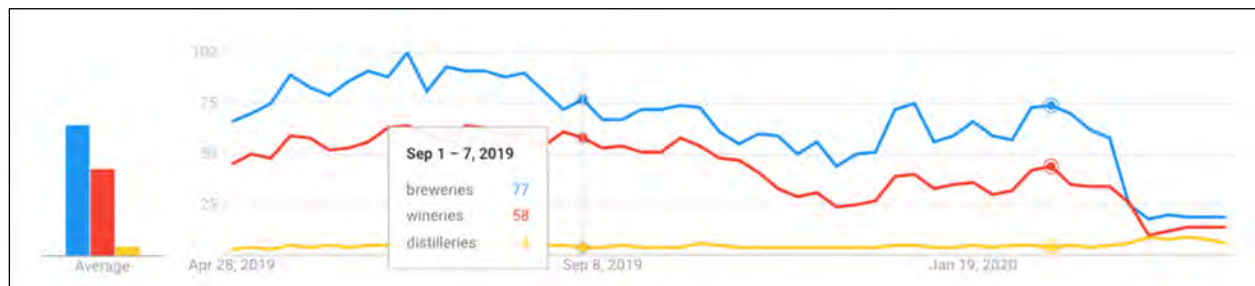


Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of March 1–7, 2020.

5. Despite growing interest in *local*, demand for breweries and wineries has dramatically dropped.

As a result of stay-at-home rules and social distancing relatively early in the pandemic, consumers ceased to look up much information on breweries and wineries, starting in mid-February (Figure 5a). However, although at a considerably smaller search volume, interest in distilleries has risen in recent weeks, perhaps as consumers sought more potent forms of alcohol, as liquor stores shut their doors in some states under non-essential business closures, or as they were looking for local sources of hand sanitizer (Distilled Spirits Council, n.d.). Searches for *breweries* and *wineries*, which tend to provide experiences rather than mere commodities, is greatest during the summer and again around the late-year holidays, and normally search volumes should be rising at this time rather than falling (Figure 5a). Both of these search terms are overshadowed by searches for *liquor stores* (Figure 5b), perhaps reinforcing the idea that consumers are seeking a greater variety and perhaps more potent drinks.⁴ A concern raised in Pennsylvania after liquor stores were closed was that sudden withdrawal could be life threatening for alcoholics (Whelan, 2020); Pennsylvania residents also started to drive into adjacent states to purchase liquor, contributing to concerns that they would be bringing the virus with them to these locations (Ebrahimji, 2020).

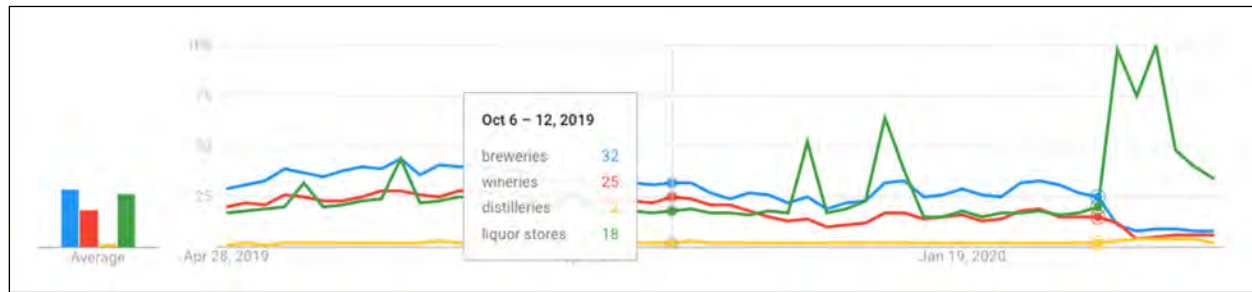
Figure 5a. Search Intensity for Breweries, Wineries, and Distilleries



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of February 16–22, 2020 as period of decline.

⁴The average consumer likely does not know the name of their local brewery or winery, and may just be looking for generic terms to find an alternative to what they know (which was perhaps their closest go-to state store).

Figure 5b. Search Intensity for Breweries, Wineries, and Distilleries with Liquor Stores



Source: Google Trends, April 27, 2020; the geography of search is the U.S.; circles to the right show week of March 8–14, 2020 as period of increase for liquor store searches, such as the decline for breweries/wineries accelerates (suggesting substitute stores/goods).

For *brewery* searches, the greatest interest was in the northern New England states, while for *wineries* it was along the western coastal U.S. and, somewhat surprisingly, Kentucky. Many breweries are now having to deal with kegs that will turn stale within a couple of months, amounting to losses estimated at US\$1 billion (Chaudhuri, 2020). This has sparked innovative collaborations among brewers and distillers across the country, who are rescuing stale beer by distilling the kegs for the production of whiskey and hand sanitizer (Japhe, 2020).

Conclusion and Shortcomings

Even though demand for local food has increased over the past decade, only a small number of Americans buy regularly from local food outlets, such as farm stands, farmers markets, and CSAs (Kolodinsky et al., 2020). It is likely that interest in local products and markets has increased because of consumer demand for convenient and safe access during this time of sheltering, where distant travel is restricted. It remains to be seen whether consumer interest in local will persist as restrictions loosen in the coming months, and how innovations in short supply chains during the peak of the pandemic will ultimately affect the long-term profitability of local foods systems (e.g., Ahearn, Liang, & Goetz, 2018).

What we show in this commentary has shortcomings, including inherent noise in the data based on the search terms. Nevertheless, this relatively quick examination of Google searches shows how real-time data can be collected and interpreted to understand what is preoccupying consumers from week to week during a pandemic. More refined analyses could be carried out in the future, with rigorous hypothesis testing.

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COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

**Pandemic and food security:
 A view from the Global South**

**JAFSCD
 Responds to
 the COVID-19
 Pandemic**



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 American University of Beirut

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“The old world is dying, and the new world struggles to be born: now is the time of monsters.”

—Antonio Gramsci

Like many modern day viral epidemics (e.g., MERS, SARS), SARS-CoV-2 emerged from the folds of the food system. The dominant narrative puts its earliest appearance in the wet market of the Chinese city of Wuhan, where wild animals are also traded. However, there are indications that SARS-CoV-2, which is responsible for the COVID-19 pandemic, may have developed in intensive livestock farming systems, possibly pig farming (GRAIN, 2020).

Not only did the virus originate from the food system, but it also penetrated it and exposed its systemic weaknesses. The disruptions caused by the COVID-19 pandemic are now threatening the food security of billions of people. Indeed, after initial reassurances that COVID-19 posed no concerns to global food security, as the world’s silos were well stocked (Vos, Martin, & Laborde, 2020), the tone has now changed radically. We are now being warned that global hunger could double due to food supply disruptions caused by the pandemic, especially in poor nations and Africa (De Sousa, 2020).

Since the beginning of the COVID-19 pandemic, the Twitter account @foodpandemic, which I co-

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manage with Nour El Houda Amhez and Abed Al Kareem Yehya, has been tracking the impact of the pandemic on food security. While our focus is mostly on the Middle East (as the largest food importers in the world, and home to the largest number of refugees and internally displaced people on the planet) and on East Africa (where food insecurity is chronic), we also cover other countries of the South. Tracking the pandemic’s pressures on the food

system allows us to identify the different stresses on food security systematically. These are presented below according to four dimensions of food security as defined by the Food and Agriculture Organization of the United Nations (2003)¹: availability, access, utilization, and stability. The pandemic has negatively affected each of these dimensions in the following ways:

A. Availability

- The global food supply chains are currently subjected to disturbances of varying severity. Freight by land and air routes has been seriously disrupted.
- A number of food-producing countries have imposed trade restrictions on major commodities, especially wheat (Kazakhstan, Russia, and Romania) and rice (Thailand, Cambodia, and India). The soymeal supply chain has also been disrupted due to Argentinian food workers' exposure to COVID-19. However, current commodity reserves still exceed regular demand, due to above average yields in the past season.
- All countries, but especially large food importers, are scrambling to build up their food reserves and have created increased pressure on global markets.
- These developments have resulted in increases in wheat and rice prices due to a combination of demand, hoarding, and trade restrictions. Rice prices have reached a record height compared to prices in the last decade.
- Transport restrictions affecting agricultural inputs, especially seeds and agrochemicals, may delay planting for the next season.
- Harvest of the current season and planting for the new season are endangered due to limitation on the movement of migrant farmworkers.

B. Access

- At national levels, the lockdown has elicited a panic buying spree by customers, temporarily emptying supermarket shelves and increasing wastage due to unconsumed fresh food.
- Concurrently, the inability of farmers to sell food that was produced for the hotel/restaurant/catering (HORECA) sector has led to wastage and produce dumping.
- Limitation on migrant workers' movement is creating a loss of employment and income and has repercussions for increasing poverty rates in their countries of origin.
- Exposure of food workers, who are often forced to operate with minimum protection and without the ability to observe social distancing rules, is an additional stress to their health and food security.
- Lockdowns and movement control are restricting the physical ability of people to access food and is creating food deserts in areas where transport is essential for the acquisition of food.
- Reduced wages and loss of income affecting the most vulnerable are driving an increased number of people into poverty. The poorest are already experiencing reduced economic access to food, especially fresh fruits and vegetables.
- There is a global price increase in the food basket of 20% to 50%, caused by disruptions, temporary shortages, hoarding, and profiteering along the retail value chain.
- Civil society initiatives such as food banks are lending support to state food assistance programs. Some countries are providing financial support to the poorest segment of the population.

¹ "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (FAO, 2003, para. 22).

C. Utilization

- Adaptation mechanisms adopted by citizens include shifts in diets to more shelf-stable and prepackaged food as **fresh fruits and vegetables become less available**
- The triple burden (obesity, malnutrition, and undernutrition) is likely to increase due to the combination of limited access, poor dietary choices, and locked-in dietary habits compounded by less exercise.

D. Stability

- In countries in the Middle East and East Africa, such as Yemen and Somalia, the combination of conflict, siege, and locust invasion is further destabilizing food security.
- Countries that rely on oil for the largest part of their export earnings may experience difficulties due to record low oil prices. This will affect countries with limited hard currency reserves such as Nigeria, Algeria, Iran, and Venezuela.

These pressures on food security caused by the pandemic do not affect all countries or all citizens equally. We know now that Black Americans in the U.S. are dying in disproportionately higher numbers from COVID-19, and that this is related to the quality of health services in specific cities and to economic inequalities (Evelyn, 2020). We also know that in Spain the rates of infection by COVID-19 are up to seven times higher in working-class neighborhoods than in upmarket areas around Barcelona (Burgin & Jones, 2020). As early as March 9, when the U.S. was still weighing its options for how to address the pandemic, Sandro Galea, writing in the *Scientific American* blog, anticipated that the poor and the marginalized in the U.S. would be the hardest hit by COVID-19 (Galea, 2020). The geographic and class distribution of COVID-19 infections in the U.S. and Spain show this prediction to be true at the national level. It will, in all probability, hold internationally: poor countries and countries with economic, social, and political instability are likely to be hit harder.

Today, as the virus rages through rich countries, devastating families, destroying economies, and immobilizing hundreds of millions at their homes, we in the Global South are bracing ourselves for the shock. We now know that COVID-19 is not the great equalizer. We know that the poor, the marginalized countries, and disenfranchised households will suffer disproportionately. And we understand that when the storm is over, there will not be trillions of dollars in stimulus packages to restart our economies, most of which are already in tatters. We worry that even if and when a vaccine is found, there may not be enough for our countries, and that certain scientists who are working on developing vaccines think of us as guinea pigs and not as patients or people (Rosman, 2020). But most of all, we are now concerned with putting food on the table in the midst of the lockdowns and the economic crash.

The extraordinary measures that are accompanying the pandemic, especially the lockdown, mean a complete loss of income for the self-employed. These represented, as of March 1, 2020, 80% of the labor force in poor countries and 76% in sub-Saharan Africa (World Bank, 2020). In Africa, where one in five people was hungry in 2019 (FAO, IFAD, UNICEF, WFP, & WHO, 2019), food security—which hinges on the ability to acquire healthy and nutritious food—has never seemed so elusive. The lockdown is preventing 300 million school children from accessing the school meals on which their nutrition depends. The situation is even more distressing in East Africa, where the coronavirus is hampering efforts to fight one of the largest locust swarms in recent times (United Nations, 2020).

In the South, we too are paying the price for neoliberal economic guidance provided by large financial institutions. Export-oriented agricultural policies based on comparative advantage and the production of non-food produce were a keystone of those policies. As the European markets close their doors to flowers, thousands of women who work in the flower production industry in Ethiopia and Kenya

have lost their jobs and can no longer put food on the table (Bhalla & Wuilbercq, 2020). In Nigeria, where local rice production is sufficient to feed the entire population, local rice farmers have been under pressure from the rice trade and smuggling. International trade restrictions have created a situation where Nigerian rice producers and millers can provide the quantities that are needed (Economic Confidential, 2020). Whether the local rice will be affordable to all will be a question the central government needs to resolve.

The lockdowns may be the only way to halt the spread of the virus, but where social protection is lacking they may have disastrous economic, social, and nutritional consequences. Voices of the poor from Zimbabwe and the Philippines, and the Rohingya refugees in India, are clear: “We risk dying from hunger before we die from COVID-19.” Poor diets are an aggravating factor for the impact of COVID-19. Where malnutrition is endemic, such as households that cannot afford fresh fruits and vegetables, we can also expect an increase in the number of casualties. Action has to be taken immediately, but as the entire planet finds itself in the throes of the disease, there are very few places one can turn to.

In regions of conflict and crisis, such as the Middle East and East Africa, the COVID-19 threat is compounded by sieges and embargos and obstacles to food access created by political and military pressures. Millions of Syrian refugees today live in camps in Turkey, Lebanon, Syria, and Jordan, where they rely on food aid and are unable to practice social distancing. Their situation has been described as “a disaster in the making” (The Economist, 2020). Their fate is similar to the 70 million refugees worldwide for whom the pandemic is an additional distress they need to contend with.

The COVID-19 pandemic did not cause all of these issues, but it has exploited the weaknesses of a system that we have accepted for too long, and which was starting to crack. The current food system, based on overconsumption and overproduction, is one of the main problems in the Global South and the world, but it is not the only one. The food system is a symptom of the economic and political choices that are made for us, often by regimes that have little legitimacy. Just before the pandemic, people in countries such as Algeria, Iraq, and Lebanon were witnessing massive protests and were challenging the ruling class, demanding a redrafting of the social contract between the state and the citizen. The lockdown forced them into a massive self-imposed, self-funded house arrest, which is increasing their precariousness and making them reliant on charity for survival. It has also shown that central authority can enforce its will by invoking force majeure without having to offer any alternatives or addressing any of the popular demands for redistributive justice and an end to flagrant inequalities.

The COVID-19 pandemic has amplified food security issues that have been endemic in the vast majority of the countries of the South in modern times. These issues are associated with the globalized food system that controls what, when, and how people eat through its domination of the value chains. This is exacerbating obesity and undernutrition and associated noncommunicable diseases that aggravate the impact of the disease.

As we look beyond the pandemic, we must act immediately to reshuffle the food system, which is implicated in the origin, spread, and lethality of COVID-19. However, this cannot be achieved without a global movement of solidarity between all the people on the planet and the drafting of a new social pact without borders. Many among us are just starting to understand the importance of migrant workers—the invisible martyrs of the food system—in providing us with fresh fruits and vegetables, which are essential to health and nutrition. This is also the moment when people realize the importance of local food systems and of supporting small farmers and agriculture near the city.

The world that will be built after the COVID-19 “monster” cannot resemble the Old World. We cannot go back to “normal,” because “normal” is what is killing us. It is up to us all, in the North and in the South, to make the New World a better one. Transforming the food system is a good place to start.



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COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

Ecological resilience of food systems in response to the COVID-19 crisis

**JAFSCD
 Responds to
 the COVID-19
 Pandemic**



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Abstract

Resilience of food systems is being tested by the COVID-19 disruption. As with any severe disruption, collapse of some systems, innovation in others, and total reorganization of some will occur. Direct delivery of food, online farmers markets, community supported agriculture operations (CSAs), backyard food production, expansion of seed producers and plant nurseries, and decrease in restaurant share of the food dollar with increased home cooking are some trends that may be lasting. These trends can be seen as complex adaptive systems following the adaptive cycles of all open systems. The crisis provides an opportunity to examine a model of food system resilience (CLIMATED) and apply it more broadly.

Introduction

The food choice that precipitated the COVID-19 crisis was predicted more than a decade ago,¹ and the disruption induced by the virus fits a model of adaptive cycle dynamics developed nearly 50 years ago (Holling, 1973). Adaptive cycles of rapid

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¹ After a previous coronavirus epidemic (SARS), researchers at Hong Kong University predicted that a pandemic from novel coronavirus would be likely to occur in the future due to the “presence of a large reservoir of SARS-CoV-like viruses in horseshoe bats, together with the culture of eating exotic mammals in southern China” (Cheng, Lau, Woo, & Yuen, 2007, p. 683). The Rockefeller Foundation contends that meat from a bat or pangolin sold in late 2019 in a wet market in Wuhan enabled the novel virus to infect humans (Steiner, Ehsani, Milani, & Ruben, 2020).

growth, maturity, release, and reorganization are ubiquitous in social-ecological systems. Ecological resilience refers to the degree of disturbance a system can buffer before entering the collapse/release and reorganization phases. Systems can induce collapse and reorganization that affects the resilience of their subsystems as well as other systems (Sundstrom & Allen, 2019).

In recent years the concept of ecological resilience has been applied most vigorously to food systems and climate change. Agriculture is affected by climate change perhaps more than any other sector of our society (National Sustainable Agriculture Coalition [NSAC], 2019). One recent policy response is the Agriculture Resilience Act (2020), which seeks to mitigate climate change by sequestering carbon and reducing other greenhouse gases through processes that enable food systems to cope with climate change by increasing soil health and, thereby, yields and profits.

Until recently, many were losing hope that anything could be done to counter the existential threat of climate change (Lenton et al., 2019). In a few short weeks, however, the response to the COVID-19 virus has reduced greenhouse gas (GHG) emissions in China by an estimated 25% (Wright, 2020), caused a 50% reduction in nitrogen oxides in California (Goehd, 2020), and visibly reduced NO₂ levels over Italy and China (Ghosh, 2020). Worldwide, the largest reduction in CO₂ release in the last 50 years is predicted for 2020 by the Global Carbon Project (Nasralla, Volcovici, & Green, 2020), since millions of people around the world have virtually stopped traveling by car or airplane—or even leaving their homes and factories are shut down. The reduction in GHGs by 2020 urged by many (United Nations, 2018) has occurred. Whether the GHG reduction can continue is just as unpredictable as the COVID-19 disturbance itself.

The unexpected impact of the disturbance induced by COVID-19 on GHGs fits a basic realization of Holling and ecologists who followed him: the nature of Nature is change. Ecologists have now well established that natural systems do not move toward a sustainable equilibrium; instead, disruptions of existing systems of species and communities are a regular and often necessary feature for systems to be resilient (Kricher, 2009). Suppression of disruption (e.g., classic forest fire management) can prolong an untenable mature phase that makes a system less likely to survive and thrive in the future. Holling made a crucial distinction between “engineering resilience” and ecological resilience. Engineering resilience seeks stability. Stability is often the antithesis of resilience in ecological systems (Holling, 1996).

Resilient systems can fluctuate wildly and change abruptly, to reshape, reform, and adapt themselves. Many resilience researchers recognize the value of viewing biological systems as complex adaptive systems as defined in chaos theory: hierarchically nested systems that interact with each other and show adaptive and emergent qualities (Sundstrom & Allen, 2019).

Resilience researchers have also pointed out the difference between general and specific resilience. Specific resilience to a virus is a vaccine. General resilience is establishing a robust immune system that withstands a variety of viruses as they mutate and evolve.

Grocery stores appear to have a general resilience to the COVID-19 disruption. Groceries are some of the few businesses adding employees during the crisis. Surveys of consumers, grocers, and restaurateurs indicate that restaurants are unlikely to regain the 60 cents of every food dollar they received before the crisis (Redman, 2020). The owner of the largest grocery chain in New York City contends that preparing food at home was a lost art that is being rediscovered by New Yorkers. They will not go back to restaurant food, he predicts (Varadarajan, 2020).

Many researchers have attempted to define the qualities of food systems that make them generally resilient to disruptions. One summary of those frameworks (Worstell & Green, 2017) posits eight necessary qualities of resilient local food systems that are summarized by the acronym CLIMATED (Worstell, 2017), where resilience is postulated to be a function of eight qualities:

Resilience=f(Connectivity, Local self-organization, Innovation, Maintenance/redundancy, Accumulation of value-added infrastructure, Transformation, Ecological integration, Diversity)

The remainder of this essay will explore how these qualities are exemplified in the current COVID-19 crisis.

The T and I of CLIMATED refer to Transformation and Innovation.

Innovation is transformation at a smaller scale. No-till agriculture is a transformation at the level of the soil, but an innovation at the level of the farm. A system can maintain itself in the growth phase by stimulating the release and reorganization of subsystems. New complex adaptive systems compete with old, mature, calcified systems (often controlled by government or monopolistic gatekeepers), which stay alive through subsidies and bailouts and the hesitancy of past investors to embrace oncoming collapse and release. A mature system may require transformation to cope with novel disruptions.

Gatekeepers stifle innovation. After Chinese scientists released the genetic code of COVID-19, adroit researchers in Berlin created an easily replicable test for COVID-19 infection in late January (Becker, 2020; Schmitz, 2020). The World Health Organization (WHO) rapidly shipped hundreds of thousands of those test kits to 57 countries and posted the protocol online so other labs could create their own tests. The Centers for Disease Control and Prevention (CDC) initially did not permit use of the German test in the U.S. Testing in the U.S. was delayed until the CDC developed its own test, which was then recalled because it included a bad reagent and did not work (Cohen, 2020). Centralization and gatekeeping by national bureaucracies undermines the innovation needed for resilience.

The COVID-19 disruption has induced widespread innovation in food system marketing. Fear of infection at farmers markets led to closure of all markets in some cities (e.g., Los Angeles, Washington, D.C., and Seattle) and the implementation of new procedures at farmers markets to meet social distancing standards and eliminate transmission of COVID-19 (Appalachian Sustainable Agriculture Program [ASAP], 2020). These procedures were propagated nationwide by the Farmers Market Coalition (2020) to inspire consumer confidence in traditional farmers markets.

With these new procedures being adopted and at the urging of state and local nonprofits, many states and cities declared that farmers markets were “essential services” and must remain open (Greenaway, 2020). Among the nonprofits who convinced governors to let social distancing farmers markets stay open were Ohio Ecological Food and Farm Association (A. Lipstreu, policy director of OEFFA, personal communication, April 5, 2020) and the Groundworks Center for Resilient Communities in Michigan (J. Schaap, local food policy specialist, GCRC, personal communication, April 5, 2020).

More transformative systems have also been strengthened by the COVID-19 crisis. As Torry (2020) notes, “The new coronavirus pandemic is deepening a national digital divide, amplifying gains for businesses that cater to customers online, while business reliant on more traditional models fight for survival” (para. 1). The complex adaptive systems of CSAs and online farmers markets are newly flourishing as the COVID-19–induced disruption provides a new environment. A movement already underway has been invigorated by the desire for direct delivery of food and more direct value chains to minimize COVID-19 contamination (Ricker & Kardas-Nelson, 2020). The resurgence of CSAs benefits farmers in several ways: it provides funds ahead of planting and reduces the marketing and distribution costs associated with traditional farmers markets (including time of farmer and employees at market and the cost of hauling to market more produce than is needed, rather than just the ordered amount).

Reduction in GHGs due to the COVID-19 disruption has stimulated the California Air Resources Board to explore incentives to encourage more workers to work from home after the crisis ends (Gohd, 2020) with the hope of continued reduction in GHG emissions.

The COVID-19 disruption, as with all disruptions, provides an opportunity for the creative destruction of mature systems and opportunities for transformation. Resilient societies, communities, farms, and other food businesses will take advantage of the opportunities awakened by the disturbance. New jobs in home delivery, already underway with companies like Amazon and local food delivery businesses such as Instacart, Grubhub, and DoorDash, are one such opportunity in the food system. Whether working conditions at these emerging firms will undermine resilience is unknown, however.

The C, L, E and D of CLIMATED refer to modular Connectivity, Local self-organization, Ecological integration and complementary Diversity.

Communities have become dependent on outside sources of food. Even in many highly agricultural U.S. counties, nearly all food is imported (Fink, 2019). Just as the COVID-19 crisis has made the U.S. aware that 90% of many basic pharmaceuticals are imported (Palmer & Bermingham (2019), the long, rigid, and easily disrupted U.S. food supply chains have also been laid bare. One striking instance is farmers having to dump eggs and milk when both are scarce in grocery stores (National Farmers Union, 2020). A self-organized local supply of food is seen by many (e.g., Schuman, n.d.) as a positive outcome of the COVID-19 crisis. Resilience requires creating a network of relatively independent, self-reliant nodes, so that the failure of one node does not imperil the entire system. In ecological circles, such systems are known as “modular.” To be resilient, farms must be highly networked, but independent.

The more self-reliant a community is the less global disruptions will matter. Local self-organization begets more local self-organization. Not only does this boost local economic multipliers (which increases income, wealth, and jobs), but self-organization in areas such as health clinics and senior assistance results in a healthier population. An index of food system resilience, based on CLIMATED, has shown high correlations with both lower poverty and positive health outcomes (Green, Worstell, & Canarios, in press; Green et al., 2018). As yet unexamined is any quantitative correlation of food system resilience to responses to the COVID-19 crisis.

Redundancy, the ability of a system to replace its components as needed, is dependent on a diverse array of complementary individual components. When people rely on one source of food, they are likely to hoard as much as possible in times of scarcity. When they have multiple sources, hoarding is unnecessary.

Diverse systems are critical because they are less likely to fail all at once or in the same way. When the only source for COVID-19 tests is the CDC, and the CDC test fails, the entire country suffers. Consumers who previously bought all their groceries at a grocery store have become aware, due to the COVID-19 disruption of grocery supplies, that farmers can deliver direct. This will be an opportunity for producers who can master distribution systems. Where logistic and distribution challenges can be met, consumers will not be dependent on grocery stores, but can buy from multiple farmers.

Gatekeepers, whether elected or unelected, can decrease the diversity and resilience of food systems by closing all farmers markets regardless of their social distancing and hygiene standards, as many U.S. mayors have done in the COVID-19 crisis.

Bringing food production to its local apex—planting of “victory gardens”—is an activity being adopted by many families forced to stay home by the COVID-19 crisis (Rao, 2020). Producing food locally requires integration into the local ecosystem to produce the food products best fitted to one’s local ecological conditions. This trend induced by the pandemic has also led to reported increases in sales and jobs at plant nurseries and seed providers (Marantos, 2020).

Although social distancing is a major output of the crisis, social bridging has also been a result of the COVID-19 crisis (Webb, 2020). Hundreds of voluntary, nonprofit initiatives are sourcing food from farmers and delivering to the elderly or others staying at home (Grillo, 2020). In one example, 35 Face-

book groups have been set up with 30,000 members in three counties in Nova Scotia to connect those who need assistance with those who would like to provide it. These groups say they are countering fearmongering with “caremongering” (Gerken, 2020).

The M of CLIMATED refers to Maintenance (or redundancy, in ecological terms).

Just-in-time supply chains can be efficient, but efficiency can be the enemy of resilience. Times of disruption reveal whether systems have enough redundancy to maintain their crucial functions. The current crisis has revealed the lack of crucial hospital equipment and of local and even national capacity for the production of simple items such as masks and reliance on a single, often distant, source for crucial drugs and equipment.

The lack of grocery stores in urban areas has resulted in pressure to keep open local convenience stores, which sell mostly tobacco, liquor, and lottery tickets, but are the only source of food for those without personal transportation. With high levels of COVID-19 contraction occurring in urban areas, the resilience of both urban food production and alternative, more direct sourcing of food to urban areas is underscored (Sowerwine, 2020).


The A of CLIMATED refers to Accumulation of value-adding infrastructure.

Self-organizing, modular connectivity and complementary diversity only produce lasting results when local food system agents acquire and maintain value-adding infrastructure. For climate change, the most basic infrastructure is the soil. If soil health (chiefly dependent on sequestered carbon) is not increasing, resilience is decreasing. In the current pandemic, the most publicized lack of crucial infrastructure are manufacturing capacity for ventilators and PPEs and sufficient hospital beds in some areas. Response to the pandemic shows some sign of reversing the trend toward underfunding and closing local hospitals, especially in rural areas (Bolin, Watzak, & Dickey, 2019; Holt, 2020).

To increase the resilience of the food system, many advocates are pushing for investment in on-farm storage, processing, and local distribution capacity to transform value chains to enable a more robust response to similar disruptions in the future—and to capture more of the added value for the farm. For example, as we shift from market-style set-ups at CSAs and farmers markets to pre-ordered, prepacked, and prepaid models, farm businesses must purchase packaging equipment to meet current safety protocols (ASAP, n.d.). Distribution is an often overlooked aspect of resilience-supporting infrastructure. Those with storage, on farm processing, and transportation infrastructure will rule the post-COVID-19 environment.

Consistent with the proposed federal stimulus packages focused on infrastructure, NSAC, the Farmers Market Coalition, and state policy groups are working to ensure that the infrastructure needs of farmers and the food system are not forgotten (W. King, National Sustainable Agriculture Coalition, personal communication, April 5, 2020).

Concluding Summary

The COVID-19 disruption provides an opportunity to test the validity of food system resilience models and their broader applicability. Although the outcome of the crisis is unknown at this point, many predict a wide-ranging transformation of U.S. food systems. A global public health experiment is in progress of which the food system is an integral part. The governments of other countries, such as Sweden, Germany, Brazil, and Mexico, have imposed less severe disruptions than the U.S. This essay is an initial attempt to examine the eight qualities proposed as necessary for ecologically resilient systems in the CLIMATED model and examine how broadly these qualities may apply in this particular disruption. 

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COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

Americans' food spending patterns explain devastating impact of COVID-19 lockdowns on agriculture

JAFSCD
Responds to
the COVID-19
Pandemic



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The U.S. Department of Agriculture Economic Research Service's Food Expenditures by Outlet data provide insight as to why the lockdowns related to COVID-19 have been so devastating for U.S. farmers. In 2018, American consumers bought a total of \$628bn¹ worth of food, of which \$460bn was spent at grocery stores and \$168bn at warehouse clubs and supercenters (see Figure 1 and Table 1). But expenditures on food away from home exceeded that amount: \$680bn was spent at restaurants, \$337.8bn at full-service restaurants and \$340.2bn at limited-service restaurants.² The social

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¹ All amounts are in U.S. dollars.

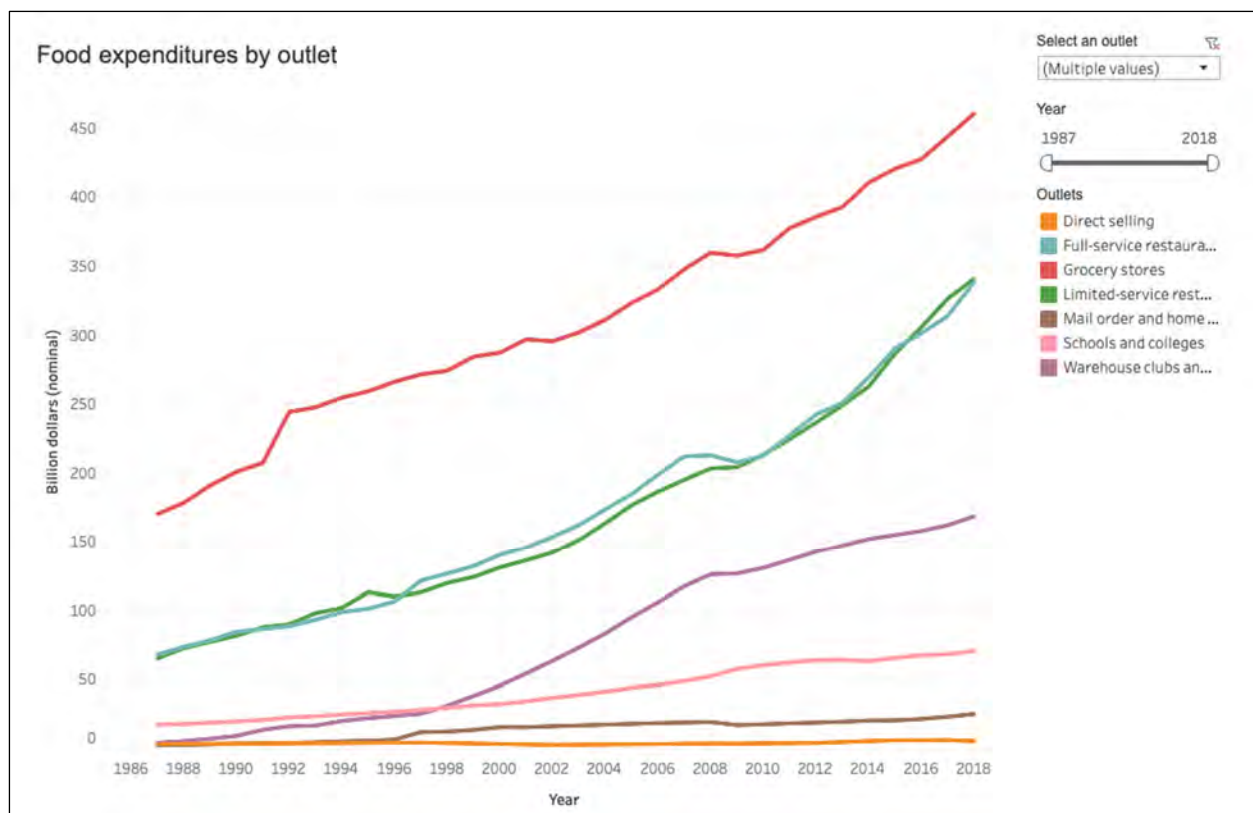
² Not all of this represents the value of agricultural products; a large share of this is value-added in the form of rents and wages.

distancing and stay-at-home orders related to the COVID-19 pandemic have forced many restaurants to close and those remaining in business to switch to pick-up or delivery only options. Because restaurant supply chains are highly specialized and time sensitive, reallocation of these supply chains has not come quickly enough to accommodate the shifts in consumption toward at-home eating patterns.


While other expenditure categories are much smaller, they have experienced marked changes, some in opposite directions. For example, mail order and home delivery volumes, valued at \$24.8bn and representing only 1.5% of expenditures in 2018, have increased markedly in the last month according to anecdotal evidence. On the other hand, schools and colleges, hotels and motels, drinking places, and recreational places—accounting for an additional 12.6% of food expenditures—have experienced dramatic reductions in demand. Perhaps most remarkable is the fact that Americans devoted only 0.3% of all expenditures on food to direct selling (these include farmers, manufacturers, and wholesalers) (Elitzak & Okrent, 2018). Along with mail order and home delivery, direct sales by farmers is one of the few sectors that appears to be growing rapidly during the evolving COVID-19 pandemic, despite social distancing-related constraints.

The COVID-19 pandemic has resulted in historically unprecedented shocks to the U.S. economy, and, by extension, to the food system. Never before have entire sectors of the economy been shut down, let alone on such short notice. While the implications for supply chains everywhere are profound, the food system may be disproportionately affected. People will continue to eat, but where they obtain their food has changed dramatically. This has contributed to logistical problems in the supply chain, from not having enough workers in the field for processing or trucks on the roads, to problems of redirecting

Figure 1. U.S. Food Expenditures by Outlet, 1987–2018



Source: U.S. Department of Agriculture Economic Research Service (n.d.).

transportation contracts to get food to the right place at the right time, and bottlenecks in processing because of packaging and labeling requirements (Held, 2020; Poppick, 2020). These factors are compounded by the time-sensitive and perishable nature of food products and the reproduction cycles of agricultural commodities, as well the vulnerability to COVID-19 infections of workers in the food system. 

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Table 1. U.S. Food Expenditure by Outlet, 2018

	Amount (\$bn)	Percent
Grocery stores	\$460.0	27.2%
Limited-service restaurants	340.2	20.1
Full-service restaurants	337.8	20.0
Warehouse clubs and supercenters	168.0	9.9
Other stores and foodservice	78.9	4.7
Schools and colleges	70.2	4.1
Food furnished and donated	45.6	2.7
Retail stores and vending	38.6	2.3
Hotels and motels	34.9	2.1
Recreational places	33.8	2.0
Mail order and home delivery	24.8	1.5
Other food away from home stores	24.3	1.4
Convenience stores	14.0	0.8
Mass merchandisers	9.2	0.5
Direct selling	5.2	0.3
Drinking places	5.2	0.3
Home production and donations	2.3	0.1
Total	\$1,693.0	100.0%

Source: U.S. Department of Agriculture Economic Research Service, n.d.

COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

Migrant farmworkers face heightened vulnerabilities during COVID-19

JAFSCD
Responds to
the COVID-19
Pandemic



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The COVID-19 pandemic has dramatically reshaped Canadian society in just a few short weeks. At the same time, its varied impacts shine a light on pre-existing social inequities. Certain populations, including low wage workers, racial minorities, homeless people, and older and disabled residents of long-term care facilities have been disproportionately impacted. One group that is particularly vulnerable to the effects of the crisis, yet has been largely neglected in discussions thus far, is the migrant worker population.

Each year over 50,000 migrant workers come to Canada through the Temporary Foreign Worker Program (TFWP)'s agricultural streams. The largest program stream within this, the Seasonal Agricultural Worker Program (SAWP), has been in place for over 50 years. SAWP brings in workers from Mexico and Commonwealth Caribbean countries for up to eight months a year to work in farms, green-

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houses, and orchards. These workers come without families and do not have a pathway to permanent residency. Migrant workers make up 10 percent of agricultural workers in Canada (Migrant Rights Network, n.d.).

The National Farmers Union (Dale, Fehr, & Pfenning, 2020) publicized some of the key problems faced by temporary migrant agricultural workers amid the COVID-19 pandemic. In particular, they noted that the COVID-19 health crisis expose “deeper problems” in the seasonal worker program, and exposes the vulnerabilities of migrant farmworkers (MFWs). While Canada tightened its borders and restricted entry of most foreign nationals, temporary migrant workers were among those permitted entry. MFWs are deemed essential workers due to the central role they play in supporting Canadian farmers and the food supply. The government of Canada is facilitating the entry of MFWs to come and work in Canada in order to protect the viability of the agricultural industry and Canada’s food system. However, it is critical that the rights and health of these workers are also protected.

The COVID-19 health crisis exposes systemic problems facing migrant workers, which have long been the target of criticism among experts working in the field (Hennebry, McLaughlin, & Preibisch, 2016). Indeed, MFWs have long suffered from deep inequities, such as isolation, overcrowded living conditions, lack of access to field sanitation and personal protective equipment (PPE),¹ difficulty accessing health care and workers’ compensation, inability to switch employers, removal to countries of origin when ill or refusing unsafe or undesirable work, and lack of access to immigration pathways. Over the years, many MFWs have lost their jobs and were sent home when they became ill or injured (medical deportation) (Orkin, Lay, McLaughlin, Schwandt, & Cole, 2014). MFWs have *closed work permits*, meaning they are tied to a specific employer. If they become ill from COVID-19, how will they fare with an unscrupulous employer or even an employer who is just trying to get their crops harvested and make a living in this fraught context? Will they be sent home? Will they lose their livelihoods? Will this fear prevent MFWs from seeking medical help, heightening the risk for themselves and other MFWs?

As previously noted, MFWs labor and live under conditions that pose risks to their health in a typical year, ranging from crowded housing to a lack of PPE, field sanitation, and handwashing stations on work sites. These vulnerabilities are only further magnified during the pandemic, placing them and their co-workers at increased risk of exposure to COVID-19 (Caxaj, Cohen et. al, 2020). Many live in tight quarters (e.g., trailers or bunkhouses) that are poorly ventilated, allowing for easy transmission of the virus, a pattern that has already emerged in prisons, meatpacking plants, long-term care homes, and homes for the disabled. To emphasize this point, Dale et al. (2020) note:

Migrant rights activists have long deplored the housing conditions that can be found on some farms. Some bunkhouses where migrant workers live are crowded and equipped with minimal bathroom facilities. Under the Federal standards for housing, employers must provide one toilet and sink per seven workers and one shower per ten workers. Most workers share large, dormitory-style rooms with six to eight workers meeting the minimum cubic volume of space required per worker. The chances for a virus to spread in such conditions are very high. (p. 16)

An outbreak exposing hundreds of workers in a greenhouse in British Columbia, resulting in 43 positive cases among migrant workers in Kelowna, has already demonstrated how susceptible migrants are in these circumstances (Rodrigues, 2020). British Columbia is trying to prevent further outbreaks by providing quarantine housing off the farm for MFWs who are returning to the province to work.

Additionally, many MFWs work long hours under difficult working conditions (e.g., rain, cold, heat),

¹ For example, when spraying pesticides

with few or no days of rest during busy periods, making them vulnerable if they are exposed to COVID-19.

Another concern is the wide variability in treatment by employers. Many exemplary employers would not tolerate abuses on their farms, such as Pfenning's Organics, near Waterloo, Ontario, which has hired migrant workers for 15 years. The problem is that with tied work permits, workers cannot control where they are placed. Essentially, MFWs depend upon luck to work for a respectful employer. This program structure, which places so much control in the hands of the employer—with almost no meaningful recourse for workers if they are not well treated—is inherently problematic.

While migrant farmworkers have been excluded from immigration policies that privilege “skilled” workers, the pandemic has shifted the discourse to emphasize that migrant farmworkers are essential due to their expertise and skill. Will this recognition of the value and skill of migrant farmworkers transform the way we treat them in the future? Will the farmers’ call for MFWs because they are “essential” and “skilled” help to enable open work permits, permanent residency status, and better working and housing conditions after the COVID-19 crisis?

Protecting the Rights and Health of Migrant Farmworkers

As part of a public health response to stop the spread of COVID-19, permitted international travelers to Canada, including MFWs are required to self-isolate for 14 days upon arrival (Quarantine Act, 2005). On April 13, 2020, the government has committed to providing financial support to employers to help cover the extra costs of adhering to procedures during the week in which many workers are already starting to arrive on farms. Farmers will receive CA\$1,500 per worker to provide suitable accommodation and supplement salaries to workers while they quarantine (Levitz, 2020). Yet critics have pointed out that without oversight and attention to where this money is directed, farmers—desperate to start the growing season—may pressure workers to work during the “quarantine” or “self-isolation” period.

Workers also need to be well supported to procure groceries, medications, and other necessities during this time. Currently, employers are responsible for arranging these logistics. However, some community organizations have already reported situations where workers arrive on farms with none of the amenities, food, or supplies needed when self-isolating or quarantining. Given the power imbalance between workers and their employers, not all workers will feel comfortable asking for assistance or reporting when they do not receive what they need (Caxaj & Plamondon, 2020). There need to be clear procedures in place to ensure that all workers know their rights and responsibilities, along with safe mechanisms for reporting any concerns of violations without fear of risking their current or future employment.


In part to address such a power imbalances amid the current urgency of the COVID-19 pandemic, advocacy groups across Canada have called for full access to employment insurance (EI) for MFWs and opportunities for permanent residency.² Many organizations, such as the Migrant Rights Network, the Canadian Council for Refugees, the Council of Canadians, labor groups, and Justicia for Migrant Workers, have called for significant changes that could help protect farmworkers’ rights. The Migrant Rights Network, for example, has called on municipal, provincial, and federal governments to ensure justice for MFWs as part of the COVID-19 response. Some of their points most relevant to migrant farmworkers are:

1. **Healthcare for All:** “Access without fear” to free healthcare, including testing for COVID-19; “Enforce clear and precise guidelines to ensure language and community-specific accessible care. All

² status on arrival.

forms of medical repatriation (deportation) . . . must end” (Migrant Rights Network, 2020, para. 2).

2. **Worker Protections:** Including adequate protective gear, “strong anti-reprisal protections for workers taking time off; income supports and open work permits for migrants who will lose wages or jobs because of sickness, quarantine or economic downturn . . . ; increased access to EI including special benefits; a federal emergency fund to provide [a] non-repayable allowance for those experiencing a loss or interruption of earnings including those outside Canada; and access to paid emergency leave as needed, with a minimum of 21 days for all workers, regardless of immigration status” (para. 3).
3. **Stop Repatriations—Permanent Residency for All:** The fear of medical deportation deters workers from seeking medical help. MFWs must be assured that they will not be prematurely repatriated for becoming ill. . . .” (para. 4).
4. **Support the Community:** Fund community supports that serve migrant workers. “Clear policies and mechanisms must be created to stop the rise of xenophobia and racism. Communications about crisis response measures, including income support, must be made accessible to communities [e.g., Spanish, Thai³]. Supports should also be directed towards poor and racialized people in the Global South”⁴ (para. 5).
5. **Those That Know, Lead:** “Migrant and community organizations should be included in planning and implementation of the current response to ensure that no one is left behind. Migrant . . . workers, and their supporters, . . . provide a road map out of this crisis and must be learned from” (para. 6).

The COVID-19 pandemic exposes how existing conditions of capitalism and systemic inequities render certain groups of workers structurally vulnerable to poor health impacts. Canada has deemed food production to be such an essential service that a travel exemption has been put in place to enable migrant workers, at the bottom rung of the agricultural labor hierarchy, to come and perform the arduous work that most Canadians reject. Should the people who perform this essential work not be treated with the dignity and rights commensurate with the importance of their labor? At the very least, such “essential workers” should have safe living and working conditions that do not place them at heightened risk of contracting COVID-19. Further, following the pandemic, the rights that these “essential” workers have been categorically denied must be finally recognized and protected. 

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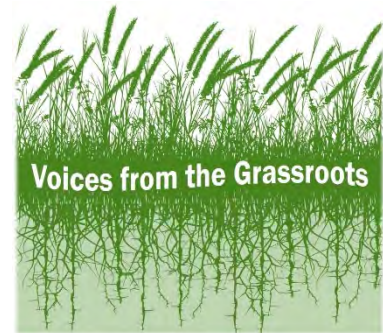
³ MFWs need access to communication in order to even receive such messaging and information, and for many living in remote areas in the back of farm properties, internet and cellular access is limited and/or costly.

⁴ Many MFWs will not return to work in Canada this year. Either their employers will not hire them back, or they will stay home due to concerns about COVID-19.

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Neighbor Loaves program aims to maintain regional grain value chains and feed the community

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**JAFSCD
 Responds to
 the COVID-19
 Pandemic**



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In the surreality of March 2020, as states closed the doors on business, my colleague Alyssa Hartman had a great idea. Watching businesses struggle, she wondered what she could do as a non-essential worker to help farmers and bakers. We set up a time to chat.

Alyssa is executive director of the Artisan Grain Collaborative (AGC), a group of individuals and organizations working to strengthen and promote the diversity of grains on the landscape in the Upper Midwest. She and I brainstorm on the phone a lot, thinking about actions to help create awareness of grains and rebuild regional grain networks. But when we spoke—as the pandemic be-

gan to change everyday life—I didn’t need to think hard about strategy. I just listened and said YES.

She described a plan to ask consumers to purchase loaves of bread that bakers would make for food pantries. These particular loaves would be made from regional flour, and customers would pay full price for them, which would help bakeries meet expenses. I loved the idea immediately.

“None of us wants to emerge after six months and have everything gone,” she told me. These Neighbor Loaves would help businesses survive during the shutdown, giving bakeries work to keep paying rents and payroll, and assuring mills and farms that their goods had somewhere to go. Plus, it would address bread shortages for emergency feeding programs. Alyssa and another AGC member, Brianna Fiene of University of Wisconsin-Madison’s Center for Integrated Agricultural Systems, worked out the nuts and bolts of the system, made graphics and Google Forms to help onboard participants, and made this thing happen in Madi-

* Amy Halloran wrote *The New Bread Basket*, a record of and template for the revival of regional grain production. Her activism for specialty grains and for changing emergency feeding programs shares a common thread: of restoring human values to the work of farming and the acts of feeding ourselves and each other. Amy can be contacted at 221 Tenth Street, Troy, NY 12180 USA, or halloran15@gmail.com.

son, Minneapolis, Chicago, and Bloomington, Indiana—for a start.

Here's how it works: Community members are invited to purchase Neighbor Loaves that they want to donate rather than eat, through participating bakeries' online stores. Bakers craft these loaves with at least 50% local flour, and the bread is distributed to area food pantries and community feeding organizations. Nearly 5,000 loaves have been purchased in the Upper Midwest since the program launched on March 28, 2020. Loaf "matching" is happening, too: local businesses have offered to purchase a certain number of loaves equal to the number ordered by community members to help keep bakeries baking and families eating. The effort has been picked up elsewhere, as well, connecting regional grain economies to people who need food in the Northeast, Pacific Northwest, and Mid-Atlantic regions. Alyssa has even gotten a note asking for support launching the program in New Zealand.

Neighbor Loaves strengthens local and regional food systems by connecting communities of farmers, millers, bakers, and eaters. As empty grocery store shelves during the COVID-19 pandemic have evidenced, resilient regional staple crop value chains mean community food security.

One of my favorite bakeries, Hewn Bread in Evanston, Illinois, has made more than 1,500 Neighbor Loaves for the nearby Hillside Food Pantry. Customers had been asking what they could do to help, and now they've got a system to support the bakery in a practical way, while also helping the growing numbers of food-insecure people in their neighborhood. In the first 20 minutes the Neighbor Loaves program appeared on Hewn's website, people bought 40 loaves. Now, many weeks into the project, people are still buying more than their own bread. Feeding others has become a part of the bread-shopping habit.

"We can't help in the way we usually help each other," one customer remarked. "Our routes of helping are broken."

The program is really firming up the footing for some farms and mills that are facing uncertainty this spring. Meadowlark Organics in Ridgeway, Wisconsin, is one of the farms whose flour is going into Neighbor Loaves at Hewn, ORIGIN

Breads, and Madison Sourdough. Having the Neighbor Loaves platform in place adds a much-needed sense of security as the farm plants spring crops.

That sense of security is shared in the project.



Hewn Bread hands off a 300-loaf batch of Neighbor Loaves baked with grain from Janie's Mill to Hillside Food Pantry, which serves residents in Hewn's hometown of Evanston, Illinois.



Neighbor Loaves cool on the rack at ORIGIN Breads, a bakery in Madison, Wisconsin, that uses flour and grains exclusively from Meadowlark Organics, an organic farm in Wisconsin's Driftless Region. The loaves are baked with 100% organic whole-grain, stone-milled wheat flour.

Many bakeries have had to trim hours and furlough employees to be able to keep operating, but Neighbor Loaves is helping to stabilize production. In Bloomington, Indiana, Muddy Fork Farm & Bakery joined the program immediately and was able



These Neighbor Loaves, baked with Illinois-grown organic grain, will feed Bloomington, Indiana, residents served by Mother Hubbard's Cupboard, and help the bakers at Muddy Fork Farm & Bakery remain financially stable during the COVID-19 crisis.



The Neighbor Loaves logo, designed by The Tiny Seed Project for The Northeast Grainshed..

For more information

Contact Alyssa Hartman through the Artisan Grain Collaborative's Neighbor Loaves page:
<http://graincollaborative.com/neighbor-loaves/>

to boost hours for its three part-time employees. These people had lost their other employment because of Indiana statewide closures. Increasing production through Neighbor Loaves allowed the bakery to increase the hours of the employees and cover their lost income.

Another regional grain group I work with, the Northeast Grainshed, is helping bakeries and mills support food pantries in remaining stocked through Neighbor Loaves. Of course, the habit of generosity is common to bakers, and many were already doing something similar. When I called the milling bakery nearest me in upstate New York, Sparrowbush Bread, to talk about flour, co-owner Antoine Guerlain was driving to upstate Vermont to fetch a bread slicer for his own donation program. Could he use the Neighbor Loaves name, he asked? I reassured him that the name and plan are meant to be copied.

“Fundamentally, we’ve tried to ask ourselves ‘what do we have that can be shared,’ amid this scary and challenging time,” he wrote on the farm and bakery’s website. Sparrowbush is now baking 120 loaves a week for two feeding efforts: a youth center in the city of Hudson that has become a food distribution hub, and a rural group, too. Money is coming in via many routes: individuals are buying bread for neighbors, and two donations (one of US\$500 from a group and one of US\$2,500 from an individual) are supporting the program. The hardest part of the work, Antoine told me, is that he has no feedback; he’s used to the face-to-face connection of farmers market sales, and it’s tough to serve a new group of eaters without knowing how they are reacting to the bread.

I love the way this project protects everyone in the grain supply chain and connects to the emergency feeding system. Maybe these relationships can continue in whatever “next normal” emerges. Fresh, local flour deserves to be in everyone’s homes and in everyone’s bread.

Infographic for Neighbor Loaves

https://i0.wp.com/graincollaborative.com/wp-content/uploads/2020/04/Neighbor-Loaves_general-graphic.png

Some Participating Bakeries

Hewn Bread: <https://www.hewnbread.com/>

Hillside Food Pantry: <http://www.hillsidepantry.org/>

Madison Sourdough: <https://www.madisonsourdough.com/>

Meadowlark Organics: <https://www.meadowlarkorganics.com/our-farm-1>

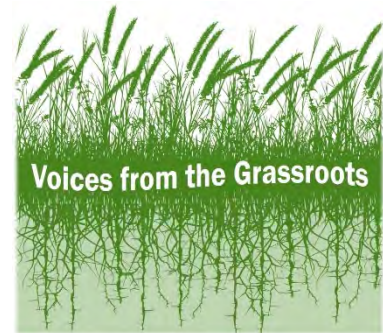
Muddy Fork Farm & Bakery: <http://muddyforkbakery.com/>

ORIGIN Breads: <http://www.originbreads.com/>

Sparrowbush Bread: <https://sparrowbushfarm.com/covid19>

Telefarming: When push comes to shelve in responding to COVID-19

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**JAFSCD
 Responds to
 the COVID-19
 Pandemic**



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COVID-19 has introduced new ways of completing jobs virtually. According to the Bureau of Labor Statistics, over 22 million Americans filed for unemployment through mid- April 2020 (Long, 2020). Approximately 747,000 citizens in North Carolina alone have been forced out of work due to social distancing requirements (Chiwaya & Wu, 2020). While some workers have been able to continue working at home or be compensated during the pandemic, such as many faculty and staff working for schools, it has been devastating for small business owners, including farmers, to handle

the pressure and stress.

During this crucial time, workers must think critically and creatively to fulfill necessary tasks. However, one job, in particular, has been deemed to be essential to our daily life and one of the most critical roles in the country: work in agricultural and food industries. The most recent U.S. Department of Agriculture farm labor report (USDA Economic Research Service, 2020) indicates that hired farmworkers represent less than 1 percent of all U.S. wage and salary employees. However, hired farmworkers contribute to a variety of jobs beyond

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working in the field or nursery. They contribute to the food system from production to the supply chain—performing inspections and working in testing labs, certification programs, educational programs, and customer services. COVID-19 has had a significant impact on agriculture and food security. The challenge of feeding people well while maintaining safety has become a major issue. Developed by my supervisor and me (Salina) is the work of *telefarming*, an old trade mixed with modern communication that can assist those who want to grow produce but may not have much experience in farming.

Although a Goldsboro native, I have not always been familiar with agriculture. I had one summer of experience along with a horticultural class to back me up on my knowledge about how to grow produce. During the summer of 2018, I had an apprenticeship with the Small Farm Unit of the Center for Environmental Farming Systems¹ (CEFS) in Goldsboro, NC; its co-director and research principal investigator, Dr. Chyi-Lyi (Kathleen) Liang, became my supervisor. CEFS is a three-way partnership between North Carolina Agricultural and Technical State University, North Carolina State University, and North Carolina Department of Agriculture and Consumer Services. This partnership has been around for 25 years with a mission to design, develop, and promote sustainable practices for farming and community development. The Small Farm Unit is a 30-acre (12-hectare) research farm divided into halves: 15 acres (6 ha) are certified organic, and 15 acres are not, although we have adopted organic practices throughout the unit. There are two small high tunnels on the certified organic side, and three large commercial-scale high tunnels in the non-organic certified side. We have further divided the production area into multiple 1/2-acre plots, and we grow mixed organic fruits and vegetables on different plots to simulate small-scale farming activities. Generally speaking, many small-scale farmers grow mixed fruits and vegetables to diversify their income sources.

The production season at the Small Farm Unit runs between March and December of each year.

We start planning and preparation in January, and we start growing transplants of some vegetables in February. One of our unique features is that we produce 20 to 25 varieties of organic specialty vegetables each year using multiple plots to train N.C. farmers to target ethnic markets to get higher-price margins. Through the experience of working on a 1/2-acre plot, I learned to use hand tools and light equipment such as seeder, weed whacker, greens harvester, and zero-turn mower to seed, weed, and harvest. All of our fresh produce is donated to local charities such as soup kitchens and faith-based organizations such as the Salvation Army. Beyond working as an apprentice to support farming activities, I also completed yard work around the farm and gained enough knowledge to be of assistance in creating training-related materials. However, I was in no way, in my personal opinion, ready to take on farming alone. So, after Dr. Liang told me that, due to the COVID-19 pandemic, I would be on the farm by myself supporting essential activities, with assistance only from time to time, I panicked.

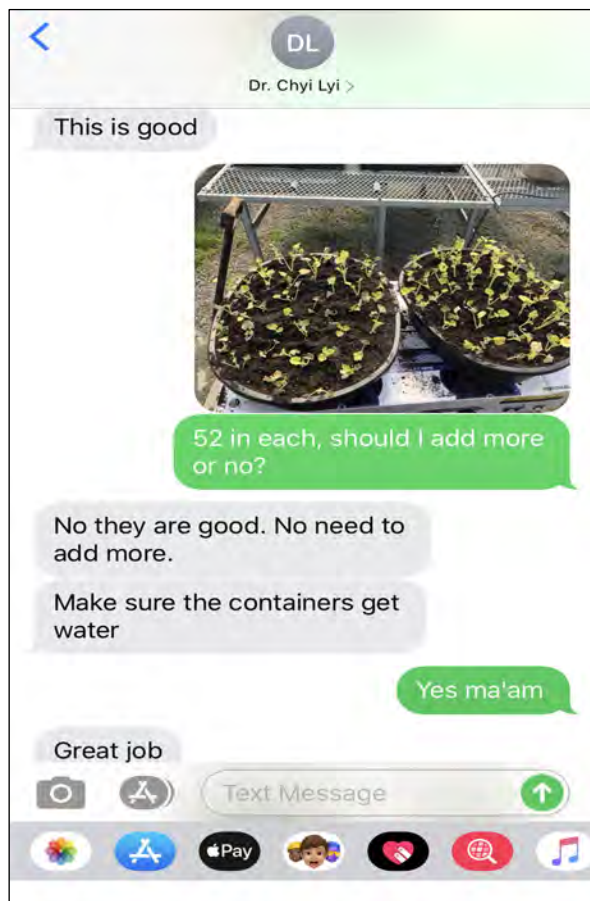
When COVID-19 hit in March 2020, we had already finished producing more than 3,000 transplants in the greenhouse in February and were waiting for spring field production. The North Carolina Department of Agriculture and Consumer Services issued a lock-down order in late March, canceling all visiting and non-essential activities at the research farm, including the Small Farm Unit. This presented a tough question that Dr. Liang needed to respond to immediately: should we continue our research operations? If we abandoned the research transplants, we would lose a significant volume of data and records to share with farmers. If we continued our research projects during the lock-down, how would we proceed, with Dr. Liang staying at home in Goldsboro and me living in Goldsboro?

Dr. Liang has always believed in me, knowing my background as a technical writer. She appreciated that my primary goals have been assisting with economic development and food security for my community. She was inclined to do whatever she could to help both my community and me, because

¹ <https://cefs.ncsu.edu/>

she has these same goals for a much broader audience. With my goals in mind and eager to show my mentor that I respected her wisdom and advice, I was learning to farm from scratch. Trusting me but understanding my limited experience, Dr. Liang assured me of no worries by saying that some staff would be on-site to provide assistance and support.

Starting in February as a research technician, I was able to harvest and donate our vegetables grown since fall 2019, as I already knew how to do that. I harvested 3 to 4 crates a day, weighed them, and donated the produce to a local soup kitchen on Fridays, accompanied by Dr. Liang. I also did yard work and kept a weekly report where I recorded the growth of the transplants and noted any changes until they made it to their new homes



Communication by text and photo guided the on-site farmer novice to be successful in saving seedlings prior to transplanting them, with guidance from the off-site manager.

come April. If everything went according to plan, we would have a bountiful and beautiful spring crop in April and May, maybe lasting into June and July.

The only issue with this beautifully crafted game plan is that COVID-19 caused a travel ban throughout the country, disallowing anyone deemed not essential. This rule left me alone in April with thousands of transplants that had no specific final locations to grow at the Small Farm Unit. My limited experience in farming hindered me from being able to finish preparing the spring plot for the transplants. Dr. Liang was aware of the issue, but as a food security advocate, she was not about to let the greenhouse starters die. I witnessed her sending numerous emails to see if she could get some sort of assistance to get the plots ready, but all she received was crickets—no response. During the few days of waiting hopelessly for responses, she asked me to continue doing my reports. Some of the transplants appeared to be fine, but from my summer experience, I knew the gourd plants were not looking too good.

After sending a picture of the gourd seedlings to Dr. Liang, she called and told me that we needed to do something quickly. She immediately gave me step-by-step instructions over the phone and via text messages on how we were going to save the gourds. All of our communications are through phone calls and messages. I was told to find buckets and crates, fill them up with mixed soil, and put the gourd seedlings into their intermediary new growing environment. I mixed garden soil along with the soil originally used for the transplants into the containers and then used Dr. Liang's "two fingers and two inches" rule to place the transplants into their intermediary new growing environment. The two fingers rule created a deep enough hole for the transplants' roots to grow, and two inches apart rule created the space needed for the transplants to grow without stealing the other starters' nutrients. To make sure this was done correctly and to preserve the life of the gourds, I had to manually switch and move the buckets and crates from the watering side of the greenhouse to the dry-bed side to let them drain while we identified beds to put them in the ground. Very soon, I ran out of buckets and crates. Dr. Liang told me to

gather similar containers around the farm, and I cleaned the containers to get rid of the spider webs, dirt, and leaves. Next, I had to monitor the automatic watering system in the greenhouse and continue to switch buckets, crates, and containers to the dry-bed side of the greenhouse. I needed to make sure to drain the excess water out of the transplant sheets on the tables so that the roots would be strong enough for their next transition into the beds.

To be sure that I was doing everything correctly, I took photos and sent them to Dr. Liang for approval. In two days, I was able to save over 1,200 gourd plants with the help of Dr. Liang's telecommunication efforts.

Through this experience, I learned how to recognize if a plant is diseased, lacking moisture, or dehydrated, and the importance of mixing soil for fertilization purposes and how to move transplants properly. I also learned that anyone can farm if you have the patience, diligence, and a telephone.



Carrots produced at the Center for Environmental Farming System's Small Farm Unit since fall 2019.

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THE ECONOMIC PAMPHLETEER
JOHN IKERD

Local food: Another food fad or food of the future?

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When anticipating the future, many experts simply examine trends of the past and project them into the future—as if trends continue indefinitely. However, one of the most fundamental principles of science is that everything on earth tends to cycle—whether physically, ecologically, economically, or socially (Culotta, 1991; Pool, 1991). All trends eventually stall out and reverse di-

rection. Some apparent aberrations or blips in trends turn out to be harbingers of impending reversals. Some see the reemergence of farmers markets and popularity of locally grown foods as a passing fad or a blip in a continuing trend toward the globalization of the food system. Others see the local food movement as a harbinger of fundamental change.

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Paine wrote of the necessity of people to form governments to moderate their innate tendencies toward individual self-interest. He wrote of “two tyrannies” in English government, the king and the aristocracy. The two tyrannies in our government today are the market economy and the corporate oligarchy. The pursuit of economic self-interest reigns supreme. Together, they have overthrown our democracy and are recolonizing our communities. In rural America, agricultural industrialization has been a primary means of economic colonization. Hopefully my “pamphlets” will help awaken people to the need for a new American Revolution—to create a sustainable agri-food economy, revitalize our rural communities, and reclaim our democracy. The collected Economic Pamphleteer columns (2010–2017) are at <https://www.foodsystemsjournal.org/public/journals/1/Economic-Pamphleteer-Collection-2017.pdf>.

Why an Economic Pamphleteer? The historic pamphlet *Common Sense*, written by Thomas Paine in 1775–1776, advocated independence for the American colonies.

To understand the meaning of the *local* food movement, it's important to understand its coevolution with the modern *organic* food movement. Both are rooted in the *natural* food movement of the early 1960s. Following World War II, the mechanical and chemical technologies developed for warfare were adapted to facilitate the industrialization of agriculture. The "back to the land" people responded by creating their own natural food systems. They produced their own foods, bought or traded food with each other, and formed the first cooperative food-buying clubs and natural food stores. The natural food movement was a rejection of agri-food industrialization.

The modern organic movement evolved from the natural food movement. Concerns about the health and environmental risks associated with synthetic fertilizers and pesticides were not the only concerns of early organic consumers. They also were responding to and nurturing a sense of interconnectedness through a commitment to taking care of each other as well as taking care of the earth. An organic *philosophy* was deeply embedded in early organic farming communities. Organic was as much a way of life as a way to produce food.

Organic foods and farming remained on the fringes until the 1970s, when scientists began to confirm the environmental and public health risks of chemically dependent farming systems. Organic foods then grew in popularity during the 1980s and 1990s, eventually moving into mainstream supermarkets. Organic food sales grew at a rate of over 20% per year from the early 1990s until slowing to 8% to 10% annually following the economic recession of 2008. Organic food sales have continued to grow faster than overall food sales, reached US\$50 billion in 2017—nearly 6% of total food sales (Organic Trade Association, 2019).

The original small organic farms and regional organic production standards didn't fit well with industrial systems of processing and mass distribution. During the 1990s, organic farmers were pressured toward larger, more specialized farming

operations. The implementation of national organic standards in the early 2000s opened the way for corporate consolidation of organic production into large operations. Organic foods eventually began to seem like just another niche in the industrial food market. Some organic consumers began to look to local farmers to ensure the ecological and social integrity of their foods. Many farmers who marketed locally continued to use organic produc-

tion practices but didn't bother with USDA organic certification. Their customers knew them personally and trusted them.

During the 1990s and early 2000s, organic food sales and numbers of farmers markets followed similar upward trends (U.S. Department of Agriculture, Agricultural Marketing Services [USDA AMS], 2017). However, the number

of farmers markets continued to grow after the recession of 2008, reaching 7,864 by 2012—50% more than in 2009. Growth then slowed, with the number increasing by less than 12% between 2012 and 2017, with 8,790 markets by 2017 (USDA AMS, 2017). Farmers markets are only one indicator of the local food movement, however. Community supported agriculture operations (CSAs), roadside stands, on-farm sales, and internet transactions are alternative means of connecting local farmers with customers. Food hubs also are an increasingly popular means of allowing farmers to pool their production to access local markets. Local food sales would be a better indicator of the local food movement than just the number of farmers markets, but little sales information is available.

A 2012 USDA special report to Congress estimated total local food sales of US\$6.1 billion (Low et al., 2015). This was less than earlier industry sales estimates, suggesting a possible downturn. However, a 2015 USDA Census Update of "Direct Farm Sales of Food" estimated local food sales at US\$9 billion, 50% higher than the earlier estimate (USDA National Agricultural Statistics Service, 2016). Both estimates included local sales to super-

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markets and institutional buyers, as well as direct sales to consumers. The 2017 USDA Census of Agriculture, for the first time, provided data for “direct to consumer” sales. Previous censuses had reported only *numbers of farmers* selling direct to consumers. The 2017 census indicated a decline of 10% in the number of farmers selling direct to consumers since the 2012 census, and a 10% drop in direct-to-consumer sales since the 2015 Census Update (O’Hara & Benson, 2019). It’s unclear whether the drop in direct-to-consumer sales might have been offset by increasing local sales to supermarkets or public institutions by fewer, but larger, producers.

The available data suggest there has been a significant change of some kind in the local food movement. One possibility is that local foods, like organic foods, are being co-opted and integrated into the mainstream industrial food system. Many supermarkets now advertise locally grown produce in season. “Local” often means produced in the same state or within several hundred miles. There is less incentive to visit the farmers market or join a CSA if consumers can buy local foods at the local supermarket. Some farmers who once sold directly to local schools and hospitals now sell to mainstream food-service providers who are attempting to accommodate preferences for locally grown foods. In both cases, the products may be sourced through food hubs or from large-scale, industrial producers.

If the local food movement becomes co-opted and corrupted, I believe many consumers will again seek other means of ensuring the ecological and social integrity of their food. A realistic possibility for a resurgence in the local food movement is through online sales. Online grocery sales in the U.S. were estimated at more than US\$28 billion in 2019 and forecasted to reach US\$59 billion by 2023—about 6% of total food sales (Conway,

2020). Amazon has entered the online market with a number of options for online grocery shoppers (Leonhardt, 2019). Increasingly, food hubs are using similar online platforms to make products of local farmers available to local customers.

Online retailing coupled with home delivery of local food would bypass mainstream distribution and retailing. Home delivery resolves the inconveniences associated with farmers markets and CSAs. Online ordering accommodates a growing preference for online purchasing among members of post-baby boomer generations, who will soon be the dominant consumers. Adding small-scale, local processing to the picture would completely bypass the industrial agri-food system, which has co-opted previous food movements. There are no readily apparent economies of scale in online aggregation and distribution of food. For perishable food prod-

ucts in particular, online sales, assembly, and delivery linking local farmers with local customers could be more efficient than are current regional and national initiatives. In addition, customers would have an opportunity to connect with local farmers of their choice, ensuring the integrity of their food through personal relationships of mutual trust.

There are ways of *networking out*, rather than *scaling up*, which can increase efficiency without compromising integ-


egrity. Riverford Organic Farms¹ in the UK, for example, delivers about 47,000 food boxes a week by filling customers’ online orders with products from farms in their area. Riverford has also been able to accommodate the needs of both small farmers and larger independent growers while maintaining the confidence and trust of their customers (Riverside Organic Farms, n.d.).

Regardless, the dominant trend in the agri-food system eventually will run its course and reverse. In previous columns, I have defended the integration of agroecology (Ikerd, 2018) and food

If the local food movement becomes co-opted and corrupted, I believe many consumers will again seek other means of ensuring the ecological and social integrity of their food.

¹ <https://www.riverford.co.uk/>

sovereignty (Ikerd, 2015) as conceptual frameworks for agri-food sustainability. These concepts reflect the basic laws of nature, including human nature. All things are interconnected: eaters, farmers, farms, communities, and ecosystems. Sooner or later, agri-food systems must conform to the

basic laws of nature. The only sustainable food systems will be local food systems that reconnect people with particular ecological and social places—regardless of whether the current local food movement is a blip or a harbinger of change. 

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VIEWPOINT

Just Transition for agriculture? A critical step in tackling climate change

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Abstract

Just Transition has become an established discursive and conceptual framework to transition economic industries toward a low-carbon and climate-resilient future. In the coal and mining industry in particular, it has gained a foothold and transformed politics and livelihoods. In other areas, like animal agriculture, which is equally damaging to the climate, the need for change and the deployment of Just Transition to achieve it are not yet established. Drawing on the most recent scientific insights by the Intergovernmental Panel on Climate Change (IPCC), this viewpoint argues that transitioning toward a low-carbon production is just as imperative in agriculture. Specifically, it demands that we move away from animal agriculture. The viewpoint concludes by sketching possible areas and means of intervention.

Keywords

Animal Agriculture, Climate Change, Greenhouse Gas Emissions, IPCC, Just Transition, Meat, Paris Agreement, Plant-Based Diet, Trade Unionism

Just Transition: A Common Future Through Community Development

Massive changes in investments, economic policy, and enterprise-level transformation historically have focused on smooth financial transitions, but they have left the people affected by the turnarounds unprotected. Former military servants, for example, lacked guidance on how to make a living in times of peace. Similarly, coal workers affected by coal plant retirements are facing job loss and lack of employability. Entire communities in coal-dominated towns are threatened by declining tax revenues, infrastructure maintenance, and local services. In response to these challenges, Just Transition emerged as a movement that recognizes that a shift toward a climate-resilient and low-carbon economy is inevitable, and which aims to support workers affected by economic restructuring. In

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short: “Transition is inevitable, justice is not” (Movement Generation, 2019, para. 1).

The framework is creative and revolutionary. It succeeds at arguing that the brunt of economic transitions should not be borne by individuals and communities previously thought to provide valuable services to the public, like extracting coal for energy production. Instead, it is the public’s responsibility, as a whole, to ensure justice during transition. The Canadian Government was one of the first to recognize this by commissioning a task force to sketch a Just Transition for Canadian coal power workers and communities. In February 2019, the Task Force on Just Transition for Canadian Coal Power Workers filed its final report. It found that the federal government has a duty to prepare communities that are economically dependent on coal for a future when their products aren’t needed, and demanded that its proposed policies to achieve this goal be written into legislation (Government of Canada, 2018). This was one of the first public acknowledgments of the fact that transitioning toward a sustainable future is a community effort.

Because its focus is on securing workers’ rights and livelihoods, Just Transition is essentially a trade union movement, embedded in a broader environmental context. The movement gained a foothold internationally when, in 2010, the International Trade Union Confederation (ITUC) unanimously adopted Just Transition as a framework for climate change challenges:

Congress is committed to promoting an integrated approach to sustainable development through a just transition where social progress, environmental protection and economic needs are brought into a framework of democratic governance, where labour and other human rights are respected and gender equality achieved. (ITUC, 2010, para. 2)

Three years later, in 2015, the International Labor Organization (ILO) adopted the Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All. At the Paris Climate Conference (COP21), which took place the same year, 195 countries signed the Paris

Agreement, a United Nations Framework Convention on Climate Change (UNFCCC) treaty dealing with greenhouse gas (GHGs) emissions mitigation, adaptation, and finance. The Paris Agreement provides in its preamble that the parties

Tak[e] into account the imperatives of a Just Transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities. (United Nations, 2015, Preamble, p. 2)

Just Transition, in short, is now widely accepted as a guiding framework to adapt and, in some cases, reform economic sectors in response to climate change challenges.

Animal Agriculture is the ‘New Coal’

Thus far, Just Transition has been applied primarily to the coal and mining industry. But as the world aims to transition toward a zero-carbon society, other sectors responsible for massive contributions to climate change will be subject to transition, too. This is highly likely when it comes to the agricultural sector, particularly animal agriculture.

Since 1960, the global population has more than doubled, while meat production has tripled and egg and dairy production has increased four-fold (Pew Commission, 2008). The animal agricultural industry today consumes 70% of global fresh water, utilizes 38% of global arable land, and causes 14% of the world’s GHG emissions, generating more methane, nitrous oxide, and carbon dioxide than the worldwide transport sector (Poore & Nemecek, 2018; UNEP, 2010). As such, animal agriculture is one of the biggest contributors to climate change.

Across the world, the high demand for animal products is satisfied by intensifying production in factory farms (also known as concentrated animal feeding operations, or CAFOs), where animals are housed indoors in extreme confinement. CAFOs release immense amounts of ammonia, hydrogen sulfide, volatile organic compounds, nitrous oxide, and particulate matter that pollute air and water surfaces (Food and Agriculture Organization of the United Nations [FAO], 2006; Organization for Economic Co-operation and Development

[OECD], 2004; Wilson, 2007). The production of animal protein uses far more food and water resources compared to plant-based diets, putting agriculture and drinking water supplies at peril (FAO, 2015; United Nations Environmental Programme [UNEP], 2010). Moreover, land requirements for CAFOs are ten times, and fossil energy requirements eleven times, greater than for plant farming (Pimentel & Pimentel, 2003).

These scientific insights have led the United Nations (UN) to acknowledge that animal agriculture is “one of the most important drivers of environmental pressures” and that “[a] substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products” (UNEP, 2010, p. 82). Nine years later, the Intergovernmental Panel on Climate Change (IPCC) essentially came to the same conclusion, finding:

Balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health. (IPCC, 2019, p. 26)

Despite this knowledge and its endorsement by major international organizations, efforts to apply Just Transition to animal agriculture are few and far between. Climate Justice Alliance which was formed in 2013, is one of only a few organizations that recognize the global food system’s GHGs, demand Just Transition be applied to the sector, and raise awareness for food sovereignty (2019). Yet the translocal organization fails to zoom in on animal agriculture or call for a bold move away from it, and thereby overlooks the elephant in the room. The same is true of Movement Generation (2019), which was critical in further developing the Just Transition concept and calling attention to the harm of extractive economies and promote a transformation toward regenerative economic practices.

One reason for the lack of attention paid to animal agriculture seems to be that the industry has long enjoyed a privileged status and sweeping exemptions from the law. Agricultural exceptionalism has consistently insulated agricultural producers from regulation, advancing social priorities in a range of fields including trade, environmental protection, labor and employment law, and animal protection (Blattner & Ammann, 2020; Ikerd, 2020; Pollans, 2016; Rodman et al., 2016; Schell, 2002; Trebilcock & Pue, 2015).

Another reason might be that many people consider their food choices to be beyond the grasp of law and politics. As a consequence, diet change for a common future in which climate change does not pose a constant threat is seen as a voluntary move, subject to each person’s own decision. This seems odd because the same piecemeal approach could have been used when it comes to coal: “Let energy consumers decide for themselves!” Yet there was broad acknowledgment for the need to phase out coal because the industry contributes tremendously to climate change, threatening human livelihood and existence (Government of Canada, 2018).

It is precisely this massive contribution to climate change that the coal industry and animal agriculture have in common. By producing 25% of global GHG emissions, the burning of coal, natural gas, and oil for electricity and heat is considered to be “the largest single source of global greenhouse gas emissions” (U.S. Environmental Protection Agency, n.d., “Global Emissions by Economic Sector,” para. 2). However, agriculture, forestry, and land use have the same carbon footprint. As the author of the Elcano policy paper on Just Transition make clear:

Agriculture, forestry and land-use account for a roughly comparable share of global greenhouse gas emissions as heat and electricity production—about 25 percent. . . . Yet there are 827 legislative and executive acts globally addressing low carbon energy supply and only 320 acts addressing emissions from agriculture, forestry and land use change. (Averchenkova, 2019, p. 22)

The Need for Just Transition in Animal Agriculture

From a climate perspective, the failure to apply the Just Transition principles to animal agriculture is both irrational and irresponsible. It is *irrational* because coal and agriculture produce similar amounts of GHG emissions, yet, only one sector is subject to discontinuation. And while coal alternatives are not yet fully available, alternatives to carbon-heavy animal agriculture are ubiquitous, which should ease the transition. Keeping up a policy dichotomy between coal and animal agriculture is *irresponsible* because as governments focus on coal alone, valuable years of fighting climate change are lost and the rate at which it destroys the environment—and with it, human and animal livelihoods—accelerates.

Turning a blind eye on agriculture is also problematic from the perspective of agricultural workers. Research has shown that agricultural business practices stifle low-income communities, racial minorities, and migrant workers (Bullard, 2000). Farmworkers are at a predictable risk of serious physical injury, denied compensation, and crushed for their efforts to self-organize (Human Rights Watch, 2004). As a consequence, they continue to belong to particularly vulnerable social and economic groups (Rodman et al., 2016).

Today, individual farmers bear the brunt of transitioning toward carbon-neutral production (like plant-based foods). They have to develop new business models, retrain their personnel, stem the financial burden, and deal with social stigma (Axworthy, 2019). Farmers, like coal miners, need their community and governments to support them in this process. They need to know that there is a future, livelihood, stability, and identity if they decide to make the transition. By helping them move from degenerative farming toward regenerative farming practices, we as a society acknowledge our co-responsibility in food consumption and production and, thereby, help ourselves too. Just Transition, by working toward sound investments, social dialogue, research-based impact assessments, social protection, and economic diversification (Gilbert, Schindel, & Robert, 2018), must be part of this equation.


The legal bases for this move are already in place. Theoretically speaking, through the Just Transition lens, *any sector* affected by restructuring due to climate change must provide new green job opportunities, anticipate potential losses of economic activity, employment, and income in certain sectors and regions, and protect the most vulnerable (ITUC, 2010). Just Transition for animal agriculture should be taken up by activist groups and centered for discussion at established international organizations like the ILO, the IPCC, the UN, and particularly the UN's FAO. Specific areas that we should focus on as we transition toward a low-carbon and climate-resilient agricultural model are:

- Sound investments in low-emission and job-rich sectors and technologies. These investments must be undertaken through due consultation with all those affected, respecting human and labor rights and Decent Work principles.
- Social dialogue and democratic consultation with social partners (trade unions and employers) and other stakeholders (e.g., communities).
- Research and early assessment of the social and employment impacts of climate policies.
- Training and skills development, which are key to support the deployment of new technologies and foster industrial change.
- Social protection, along with active labor market policies.
- Local economic diversification plans that support decent work and provide community stability in the transition. Communities should not be left on their own to manage the impacts of the transition, as this will lead to an unfair distribution of costs and benefits (ITUC, 2015).¹

Be it on the international, state, local, or community level, it is time that we acknowledge animal agriculture as a blind spot in climate politics; that we begin a conversation about the risks that we

¹ For an attempt to describe Just Transition's demands in public school food systems, which can be used as a model for Just Transition in agriculture, more broadly, see Gilbert, Schindel, and Robert (2018).

thereby create for society, farmers, consumers, and future generations; and that we embark on these challenges together, through collective empowerment, rather than through antagonism, denial, and fear—dynamics that currently frame the discussion of agricultural policy. A first step toward achieving

these goals is producing more research that details affected subsectors and end goals, and shows how a transition could be initiated, who should be involved, how it could be financed, and what the process should look like so that the framework succeeds at delivering on being just for all. 

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VIEWPOINT

Nutrition education in the Anthropocene: Toward public and planetary health

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Abstract

Nutrition education has traditionally focused primarily on food and nutrition knowledge, motivations, and skills that facilitate behavior change. This essay argues that while this content remains an essential foundation for nutrition education, is it no longer sufficient. In the Anthropocene—the current distinct geological period during which human activity is the dominant influence on climate and the environment—the goal of nutrition framework is twofold: public health and planetary health. This approach requires that competencies in food systems, agriculture, and policy be included in the education and training of food and nutrition education practitioners and researchers. Academics

need to ensure that such competencies are addressed in course content. Advocates need to be vigilant to ensure that sustainability, food systems, and community aspects related to nutrition and diet are incorporated into policy. The relevance of nutrition education will depend upon the degree to which this shift is successful.

Keywords

Anthropocene, Diet, Food Skills, Health Outcomes, Nutrition Education

Disclosure

The views expressed in this reflective essay are those of the author and not necessarily the views of the Society for Nutrition Education and Behavior (SNEB) or its members. The author is the current president of SNEB.

Author Note

This reflective essay was adapted from the presidential address presented on July 29, 2019, during the business meeting at the 52nd Annual Conference of the Society for Nutrition Education and Behavior in Orlando, Florida.

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Introduction: Urgency

As president of the Society for Nutrition Education and Behavior (SNEB)—the only professional organization focused solely on nutrition education—I have an ongoing preoccupation with the role of practitioners, academics, researchers, and policy advocates in today’s health and ecological contexts. Last summer, as my term as president of SNEB was about to begin, I prepared remarks for the presidential address I would give at the upcoming annual conference. I felt a deep sense of responsibility and opportunity, not to mention urgency. My sense of urgency no doubt was intensified by the heatwave that had settled stubbornly in the U.S. Northeast, where I live, and throughout a large swath of the rest of the country. As I repeatedly pressed “save” to retain my changes, the mercury reached the predicted 97 degrees Fahrenheit and the heat index, thanks to the region’s typical humidity, was well on its way to north of 105 degrees.

Simultaneously, across the Atlantic much of Europe was experiencing record high temperatures (Henley, 2019), setting new, all-time national heat records in four countries. So, it was difficult (if not impossible) to ignore the first cause of my feeling of urgency: climate change. Viewing it through the lens of nutrition education, I grew disheartened by how little has been done on a cooperative and global scale to address this issue. This is disheartening, as well, because of steadily mounting evidence and agreement among scientists globally that “it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century” (Intergovernmental Panel on Climate Change, 2013, p. 17). The implication is that changes in human activity are essential to solving this crisis.

Maddeningly, solutions to climate change were at hand when I first learned about the “greenhouse effect” in the 1970s as an undergraduate in the (then) Food and Nutrition Program at Huxley College of the Environment at Western Washington University. I remember well the original Earth Day in 1970 and the excitement and hope surrounding it. But sadly, efforts to achieve meaningful policy change, energy regulations, and controls on greenhouse gas (GHG) emissions that were clearly artic-

ulated and attracted strong support, ultimately were not enacted (Rich, 2018). So, here we are.

As David Wallace-Wells makes abundantly clear in *Uninhabitable Earth* (Wallace-Wells, 2019)—his no-holds-barred account of what we can expect as climate change progresses—we are in for a whole lot of pain and suffering unless radical changes are made in all aspects of our lives, public policies, and economic systems. According to climate experts, our window of opportunity to avoid the 2-degrees centigrade global temperature increase that scientists believe would spell catastrophe (Intergovernmental Panel on Climate Change, 2018) is closing fast.

My sense of urgency is also exacerbated by what is happening to the natural world *overall*. In May of 2019, the United Nations released a policy-makers’ summary of its *Global Assessment Report on Biodiversity and Ecosystem Services* (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES], 2019), which is considered to be the most comprehensive assessment of global nature loss to date. The report’s bottom line is that one million of Earth’s known eight million species are threatened with extinction. The report details how “human actions threaten more species with global extinction now than ever before,” and suggests that “around 1 million species already face extinction, many within decades, unless action is taken to reduce the intensity of drivers of biodiversity loss” (IPBES, 2019, pp. 16–17).

In an earlier paper published in *Science*, Rodolfo Dirzo and colleagues describe what they termed “defaunation” in the Anthropocene and credit humans with the cause: “We live amid a global wave of anthropogenically driven biodiversity loss: species and population extirpations and, critically, declines in local species abundance. Particularly, human impacts on animal biodiversity are an under-recognized form of global environmental change” (Dirzo et al., 2014, p. 401).

These planetary perils—climate change and species extinction—are increasingly seen as intertwined with poor nutritional health globally in all its forms, including obesity, undernutrition, and other dietary risks. The *Lancet* Commission report from February 2019 claims that three pandemics (obesity, undernutrition, and climate change) “rep-

resent The Global Syndemic that affects most people in every country and region worldwide” (Swinburn et al., 2019, p. 791). These pandemics constitute a syndemic, or “synergy of epidemics,” because they co-occur in time and place, interact with each other to produce complex sequelae, and share common underlying societal drivers” (Swinburn et al., 2019, p. 791). The report suggests that “the major systems driving The Global Syndemic are food and agriculture, transportation, urban design, and land use” (Swinburn et al., 2019, p. 791).

It should be obvious that the lines connecting these drivers to food and nutrition issues—such as access to healthy food, food composition, and the food supply—are short indeed. A growing body of evidence conveys threats to and damage of natural ecosystems, how the poor will suffer the most, and how the current lack of political will to act exacerbates the situation. The question practitioners in the nutrition education space have a responsibility to grapple with is, “What does food and nutrition education look like in the Anthropocene?”—the current distinct geological period during which human activity is the dominant influence on climate and the environment (Anthropocene, n.d.).

A New Framework for Food and Nutrition Education

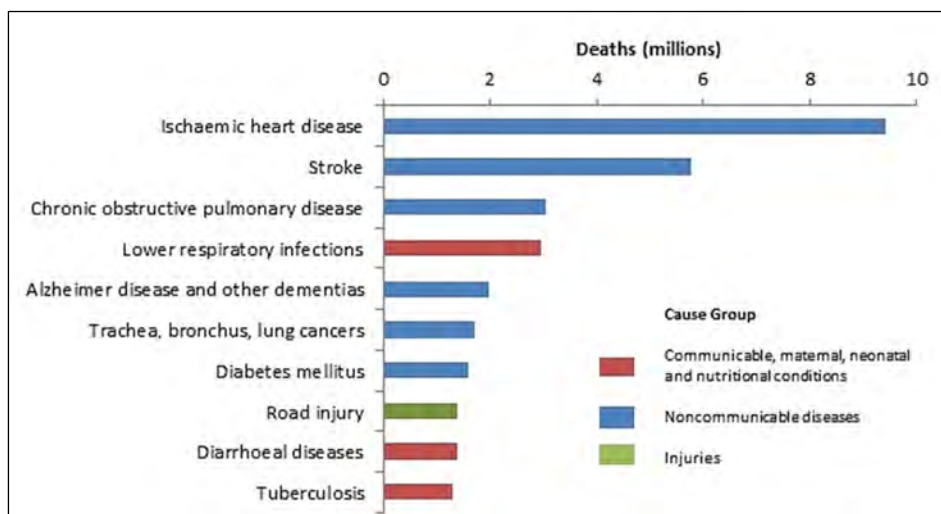
Fortunately, practitioners, academics, researchers, and advocates in the field of food and nutrition ed-

ucation already have many tools for addressing current trends and contribute in meaningful ways to solutions. The field of nutrition education is well-positioned to lead improvements in diet quality, and this action would not only help achieve better health outcomes for individuals and families, but it would also help combat climate change, address syndemics, and put the brakes on the rapid decline of nature. As I reflected with the SNEB membership, while it may seem that we’re all doomed, practically every report of our dire environmental situation ends with a message of hope and predicts a reversal of dire trends *if we act*. The question facing the food and nutrition education field is, will we act? And *how* will we?

If the nutrition education field is to remain relevant in a time of dramatic ecological change, it needs to lead or at least engage in efforts to promote food-related behaviors that enhance both human and planetary health. After all, food (and therefore eating) depends on a food system that, in turn, depends on natural resources. Human and planetary health are linked, and nutrition education offers a bridge between “after the swallow” considerations (e.g., nutrient utilization and health outcomes) and “before the swallow” considerations (e.g., food supply production methods, extent of processing and amount and type of packaging, mode and length of transportation) reflected in the National Nutrition Monitoring System framework (Liquori, 2001).

Achieving optimal health and reducing chronic disease risk through dietary change will always be central reasons for nutrition education. We know that noncommunicable diseases claim thousands of lives annually and respond to and can be prevented, at least in part, through changes in diet (Figure 1). According to the Global Burden of Disease

Figure 1. Top 10 Global Causes of Death, 2016



Source: World Health Organization, 2018.

(GBD) study, an estimated one in five deaths globally—equivalent to 11 million deaths—is associated with poor diet, as diet contributes to chronic diseases, particularly heart disease, stroke, cancer, and diabetes in people around the world (GBD 2017 Diet Collaborators, 2019; World Health Organization, 2018).

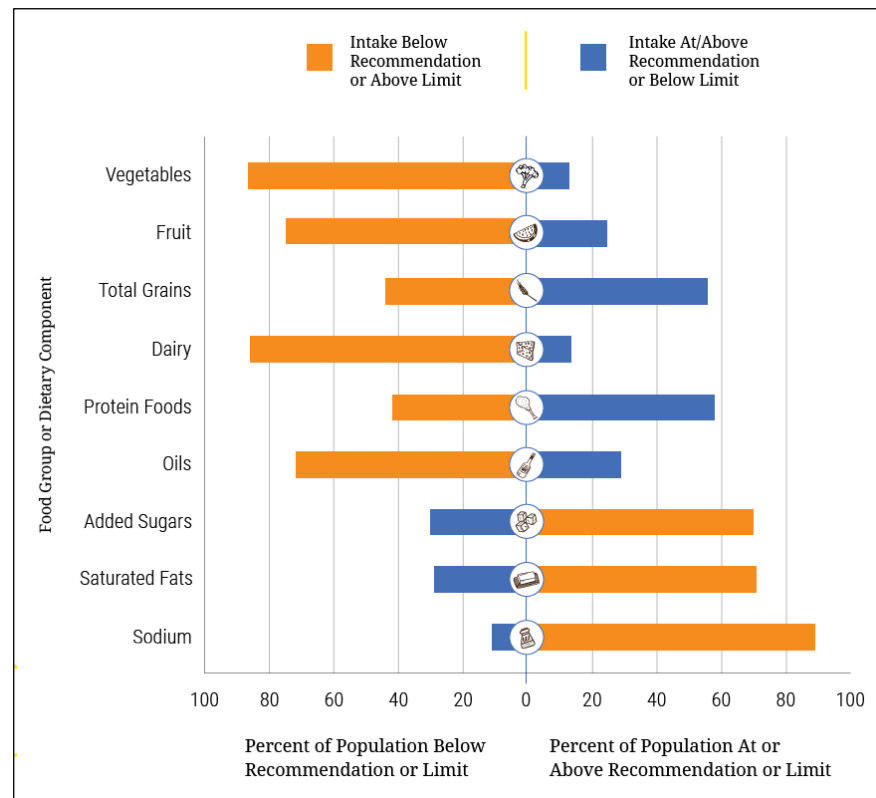
In the United States, the top 10 causes of death include four that are diet related (Centers for Disease Control and Prevention, 2017).

Further, the fact that diets, especially among Americans, diverge significantly from established federal dietary guidelines (Figure 2), will continue to be a key justification for nutrition education.

In other words, an essential aspect of nutrition education is and will continue to be founded on the integration of evidence related to the links among food, nutrition, diet and health, understanding of determinants of individual behavior change, and environmental supports that encourage and sustain desired behavior change. In this traditional model of nutrition education (Figure 3), the primary outcomes are health and decreased chronic disease risk.

If we come to recognize and appreciate fully that human health and planetary health are inextricably linked, then we need to adopt a more complex nutrition education framework—one that includes evidence related to sustainability, planetary boundaries, and how food choices affect natural ecosystems. We need a framework that reshapes food environments, policy, and systems. Further, the outcomes of our work need to be twofold: improved human health and improved planetary health. Differences in the nutrient content of foods provide the basis for much of what we do in nutri-

Figure 2. Dietary Intakes Compared to 2015-2020 U.S. Dietary Guideline Recommendations

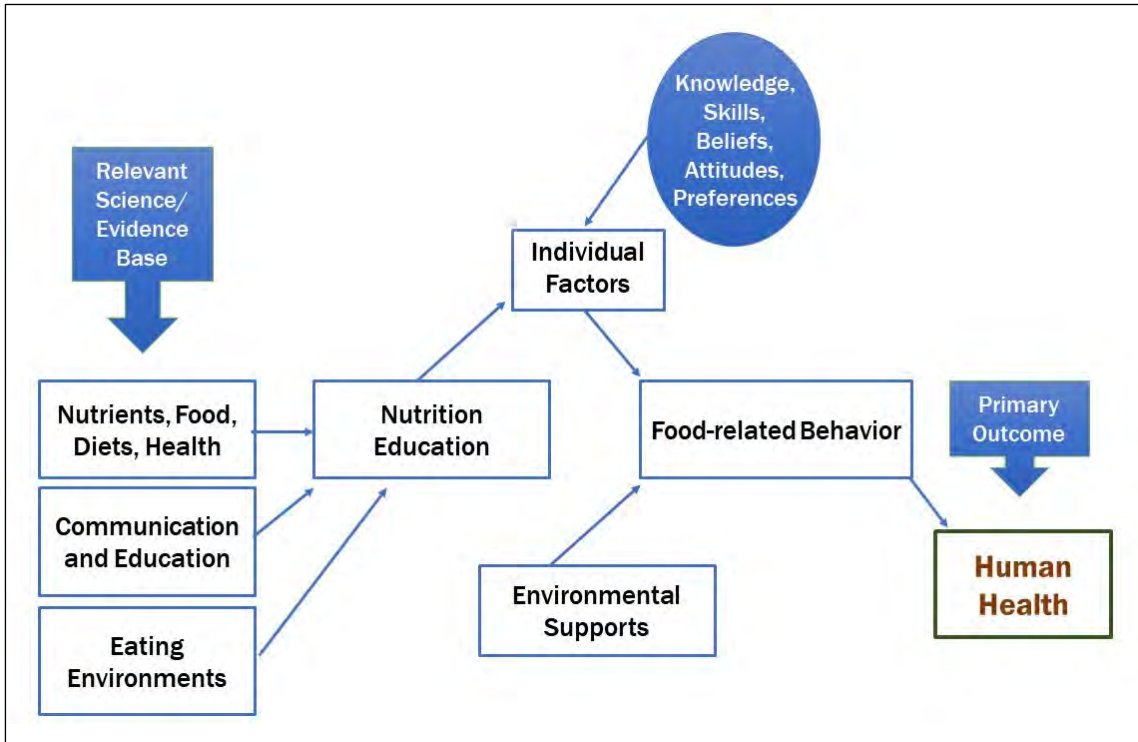


Source: U.S. Department of Health and Human Services (HHS) & U.S. Department of Agriculture (USDA), 2015.

tion education. But foods also differ in their planetary resource use, or the ecological, social, and economic impacts exerted by the type of food system that produced them. Such considerations, as well as food justice, food sovereignty, and equity, need to be fully integrated into and supported through nutrition education practice. The areas of science and philosophy relevant to nutrition education are expanded when the outcomes extend beyond human health (Figure 4).

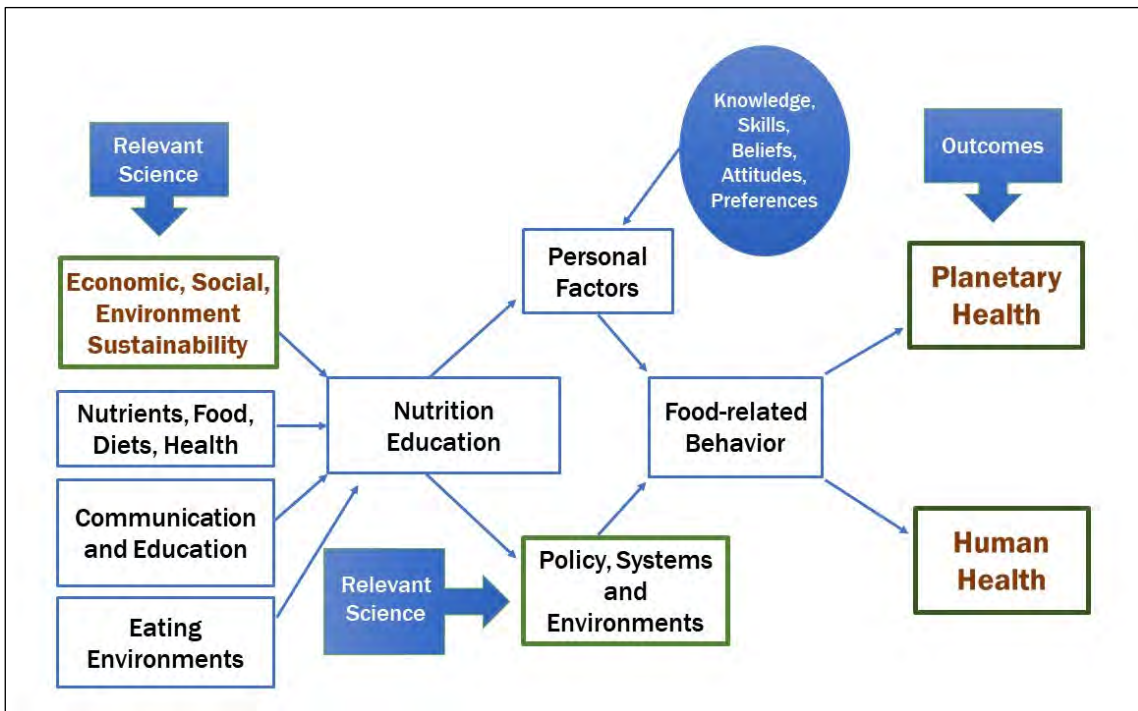
The SNEB has developed important tools in this area. Over the past several decades, the society has articulated a set of nutrition education competencies to guide practitioner education, training, and evaluation (SNEB, 2016). In addition to competencies related to foundational knowledge areas of food, nutrition, diet, and health, relevant areas of competency now include food and nutrition policy, and agricultural production and food systems (Figure 5).

Figure 3. Traditional Model of Nutrition Education focused on Human Health Outcomes



Source: Adapted from Wilkins & Gillespie, 1996.

Figure 4. Expanded Framework for Nutrition Education



Source: Adapted from Wilkins & Gillespie, 1996.

In addition to this broad set of competencies, in the January 2019 issue of its journal, the *Journal of Nutrition Education and Behavior*, SNEB published its first independent position paper, which focused on the importance of sustainability as a consideration in developing dietary guidance (Rose, Heller, & Roberto, 2019). This position statement asserts that “environmental sustainability should be an inherent part of dietary guidance, whether working with individuals or groups on their food choices or setting national dietary guidelines” (Rose et al., 2019, p. 3). This is evidence that SNEB is taking important steps toward integrating public and planetary health.

Rethinking Theory Application

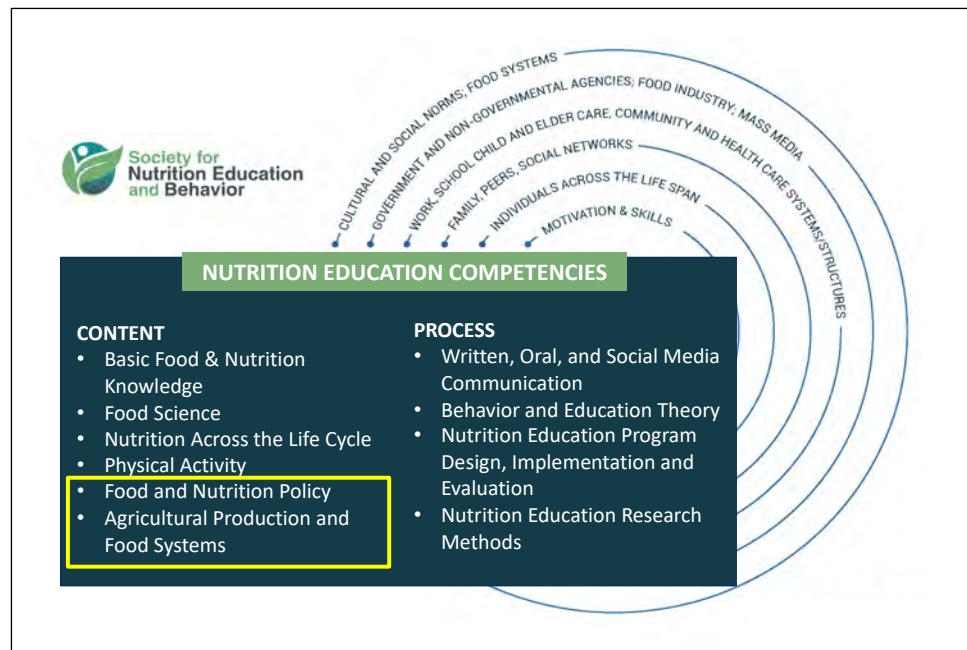
What else can nutrition education practitioners, academics, researchers, and advocates do? In my view, integrating human and planetary health needs to become the norm in food and nutrition education programs and in evaluating their outcomes. Practitioners and researchers need to ask, “What food knowledge and skills do people need in order to enhance their own health while lowering their environmental impact and enhancing resilience?” And, “How can we heighten planetary health as a motivating factor in food choices and related behavior?”

Part of the answer lies within the theoretical foundation of nutrition education. Several social-psychological theories of behavior change are commonly employed in planning and evaluating nutrition education interventions. The health belief model, the theory of planned behavior, and the so-

cial cognitive theory are among the most frequently used theoretical foundations for designing, implementing, and evaluating nutrition education programs. Each theory proposes how its specific constructs (e.g., perceived benefits, perceived barriers, self-efficacy, norms, perceived threat, etc.) interact to influence a particular behavior of interest. The field of nutrition education practice and related research applies these and other theories to predict and explain a range of food and diet-related behaviors, such as increasing fruit, vegetable, or whole grain intake, increasing variety in the diet, or reducing intake of foods high in sodium and saturated fat.

To see how theory can be applied to encompass issues and concerns beyond health, let’s start with a few key constructs, or determinants of behavior change, from familiar behavior change theories. Take for example, “perceived benefits,” “perceived risk,” and “self-efficacy,” three of the core constructs that make up the health belief model. This model asserts “people’s readiness to take action or make a health behavior change is influenced by their health beliefs or convictions” (Contento & Koch, 2020, p. 105). A nutrition edu-

Figure 5. Society for Nutrition Education and Behavior Nutrition Educator Competencies for Promoting Healthy Individuals, Communities, and Food Systems



Source: Society for Nutrition Education and Behavior, 2016.

cation program designed to decrease the risk of cancer or heart disease might focus on increasing vegetable intake as the primary behavior change goal. The program content logically could provide information about the health benefits (addressing “perceived benefits”) of consuming a diet rich in fruits and vegetables, as well as evidence related to the risks (“perceived risk”) associated with following low fruit and vegetable dietary patterns. To address “self-efficacy,” or “the confidence we have that we can perform the behavior” (Contento & Koch, 2020, p. 106), the nutrition education program might include a food-based component where participants gain experience selecting, preparing, and tasting vegetables.

In such a program, the most proximal, or short-term, outcome might be knowledge change, such as an increased understanding of the health benefits of eating more vegetables and the health risks (in this case, cancer and heart disease) associated with diets poor in vegetables. A midterm outcome could be an actual behavior, such as selection, preparation, and/or consumption of vegetables, being enhanced by an increase in self-efficacy. The long-term outcome would be a decreased risk of disease. This is a common approach for a well-designed nutrition education program focused solely on health outcomes.

How might commonly used theories and related constructs be applied if planetary health and public health outcomes were inextricably linked? The beauty of the theoretical base for most nutrition education programs is that theories can be applied to a wide range of outcomes. In fact, the health belief model was developed originally to help explain the adoption or avoidance of simple health behaviors such as vaccinations or health screenings (Rosenstock, 1974). Nutrition education programs that aimed to simultaneously improve health outcomes and ecological outcomes—protecting groundwater, essential pollinators, and soil microbes or reducing greenhouse gas emissions, for example—could focus on the same general behavior change goal. However, critical qualitative differences would shape program content. For example, when developing program content the program designer would include in “perceived risk” both direct and indirect health and environmental

threats. For example, potential health and environmental threats related to agrichemicals used in vegetable production are relevant when discussing “perceived benefits.” To address “self-efficacy,” the nutrition educator would lead a discussion of the implications of how the vegetables can be sourced (transportation type and distance) and the degree to which the vegetable varieties are adapted to the local area. Once these “before the swallow” considerations start to enter nutrition education program design, the educator’s role in policy and food system change to assure that such choices are accessible, available, and affordable begins to come into focus.

Food Skills for Planetary Health

The ‘planetary health’ diet proposed in a recent report from the EAT-*Lancet* Commission on Food, Planet, Health is a laudable attempt to link food choices with environmental impacts (Willett et al., 2019). Globally, and especially in North America, current intake of meat, animal products, and starchy foods in particular, far exceed what the commission concluded is needed to respect planetary boundaries. This assessment of food consumption imbalance might lead nutrition educators to ask, “What food and meal-planning skills do people need to reduce total meat intake and shift to ‘lower impact’ kinds of meat?” If these were driving questions, the design of nutrition education programs would change.

One implication of integrating planetary and individual health in nutrition education is grounding our practice in community and geographic contexts. What does eating seasonally and choosing from the diversity of local agriculture look like in your area? In my region of the Northeastern U.S., this means grape or rapeseed oils would replace olive oil, and in winter cabbage, carrot slaws, beets, and sprouted seeds would be used in salads. Increasingly, farmers markets offer hearty greens well into winter even in cold climates. Integrating seasonality into nutrition education requires temporal adjustments to foods, recipes, and techniques chosen for food-based programming. Sprouting seeds and legumes is an easily acquired skill, requires minimal investment in equipment, and takes minimal counter space. The yield, in terms of nutrition

and freshness in the depths of winter, is well worth the effort.

Food and nutrition education is empowering and can help the public address environmental concerns, such as the issue of single-use plastic, that consumers are increasingly bringing to light (Heidbreder, Bablok, Drews, & Menzel, 2019; North & Halden, 2013; Thompson, Moore, vom Saal, & Swan, 2009). As more and more of our food supply is packaged in plastic, increasing evidence is being uncovered detailing the threats this poses to marine life and air quality. Nutrition educators can help individuals identify food products usually available only in plastic that they could make (and might really enjoy making) themselves, such as hummus, pesto, and yogurt. Not only are such household staples easy to make, but the homemade version can be adapted to accommodate family preferences while simultaneously keeping at least some single-use plastic from entering our homes. Nutrition educators have countless opportunities to add such strategies to programs that are otherwise solely health-focused.

To most effectively address diet-related health issues, Carlos A. Monteiro recommends that health and nutrition education professionals focus less on nutrients and more on the type and extent of processing. According to Monteiro, foods can be categorized into four groups according to the degree to which they have been processed (Monteiro et al., 2019). Group 1 foods are “unprocessed or minimally processed,” such as a bunch of carrots, raisins, or a steak. Group 2 foods, called “processed culinary foods,” include butter, salt, sugar, lard, oils, and flour and are used mostly to enhance the quality and deliciousness of Group 1 foods. Group 3, or “processed foods,” includes foods that have been preserved (such as canned, frozen, or dried fruits, vegetables, and beans), pickled, fermented, or salted. Bread, cured and smoked meats, and fish are included in this group. Group 4, or “ultra-processed” items, are unlike any of the others and consist primarily of sugar, oils, salt, and starches. These commodity extractions are transformed and augmented with colors, emulsifiers, flavorings, and occasionally nutrient supplements. Recent research has shown that when people consume a diet high in ultra-processed food, they take in, on average, an

extra 500 calories per day and gain more weight than the controls consuming a diet low in ultra-processed food (Hall et al., 2019). Given the resources required for the extensive processing and packaging characterized by Group 4 foods, they come at substantial ecological costs as well. It is increasingly clear, then, that nutrition education programs need to include strategies to increase knowledge about the health and planetary risks associated with ultra-processed foods, the benefits of avoiding them, and the food-related skills needed to shift diets away from them.

Supporting Food Choices that Enhance Individual and Planetary Health

Enhancing awareness, knowledge, skills, and confidence at the individual consumer level is not enough. Eaters need supportive food environments in order to exercise their growing interest in health and sustainability. In recent years, policy, systems, and environmental (PSE) approaches to food and nutrition education have emerged as necessary companions to nutrition education focusing on the individual behavior change. In the policy area, there are several opportunities. At the interface of the consumer and the marketplace, food and nutrition educators can identify the kinds of point-of-purchase information that can help consumers make choices in the marketplace based on health *and* environmental criteria. Beyond calories, ingredients, and the nutrient content of foods, how might food labels provide information such as greenhouse gas emissions associated with foods and production methods? Certainly, nutrition educators have a role to play in developing and designing environmental and social indicators for effective food labeling policy and in conducting research on the effectiveness of related symbols and labels placed on food packages.


As important as such changes in individual food-related behavior are, we cannot ignore the fact that consumers can only choose foods from what is available in the marketplace. Increasingly, food and nutrition educators are engaging in change beyond individual food-related behavior by advocating for food system and environmental change (Rivera et al., 2017). Achieving human and planetary health means that nutrition educators

need to work at multiple levels—individual, community, systems, and policy—to change both food access and the overarching food system (Calloway, Parks, Bowen, & Yaroch, 2019).

It should also concern nutrition educators that power in the food system is concentrated in the hands, or the boardrooms, of a small number of corporate giants. As such, the nutrition education field must confront issues of food system power and control. When it comes to the food supply, what is power, and does it matter? I learned recently in Brené Brown's book on daring leadership how the Reverend Martin Luther King, Jr., defined power. In the 1968 speech he delivered to striking sanitation workers in Memphis, he defined power as "the ability to achieve purpose and effect change" (Brown, 2018, p. 95). In addition to being concise, this definition makes clear that power is not inherently good or bad. The issue is how power is wielded. In the case of the food supply, how power is used determines the extent to which health and sustainability are promoted or undermined. Certainly, the current concentration and control among a few giant corporations are not what most would describe as democracy in the food system. Individuals as food citizens have some power to shift control of the food system, but as shapers of policy, nutrition educators can and should wield more.

Since food and nutrition educators have long relied upon and based programs on the Dietary Guidelines for Americans (U.S. Department of Health and Human Services [HHS] & U.S. Department of Agriculture [USDA], 2015), the ever-present influence of food corporations and the biases and special interests that come along with it are unsettling, at best. Related to the process currently underway to revise the guidelines for the 2020–2025 edition, the Union of Concerned Scientists reported after the Dietary Guidelines Advisory Committee (DGAC) had been appointed that, "More than half the committee members come with either clear strings to industry-funded research or questionable memberships in industry-funded advocacy groups and foundations" (Jackson, 2019, para. 2). Such conflicts of interest are once again exerting pressure on the Dietary Guidelines process to make sure that the committee does not stray from

the strictly diet- and health-focused questions they have been assigned. Despite the substantial increase in scientific evidence related to diet and sustainability, the current DGAC is unlikely to include such areas of research in developing evidence-based dietary guidelines. When the DGAC reviewed the science on sustainability for the 2015–2020 guidelines, its advice to the DHHS and the USDA was to include guidance on reducing environmental impacts in recommendations on food intake. This advice was ignored and the current Dietary Guidelines for Americans are silent on the issue of sustainability. If the current DGAC wanted to address questions of sustainability, such as "How do foods differ in their GHG emissions?", by law, it could. The avoidance of such questions, as relevant to dietary advice as they are, most likely reflects either a lack of political will or fear of the consequences of riling up powerful interests, or both. In fairness, addressing all the questions in the official charge was already a tall order. However, reluctance to address questions of sustainability surely is not based on a lack of evidence, since the published research in this area has expanded substantially in the five years since the last DGAC review of the literature (Reinhardt, 2020). What can food and nutrition educators do? As Stephanie Feldstein writes in *The Hill*, "the 2020-2025 Dietary Guidelines for Americans will have serious consequences for the climate, food security and public health that will extend beyond the next five years" (Feldstein, 2019, para. 4). Nutrition educators, academics, researchers, and advocates need to speak up.

I believe there is great potential for the field of nutrition education to lead the movement toward an integration of human and planetary health. Expertise in food and nutrition and the ability to use that knowledge to empower people to change is needed now more than ever. However, for the field to remain relevant, the changes in food choices we encourage can no longer be focused solely on nutrients, foods, and diets associated with positive health outcomes. Every food choice also impacts the natural, social, and political environments. These impacts need to inform the content of food and nutrition education practice if the field is to play a central role in achieving planetary health. 

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VIEWPOINT**Land access policy incentives: Emerging approaches to transitioning farmland to a new generation**

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Abstract

Success for young, beginning, and/or socially disadvantaged (New Gen) farmers and ranchers depends on their ability to secure suitable land to start and expand their operations. Yet this is a significant and widely reported challenge. It is especially difficult for beginners to acquire suitable land with appropriate housing and infrastructure.

The U.S. federal government and several states have recognized this challenge and addressed it with various types of financial incentive policies. However, little research has been done to measure the impacts and reach of these policies, even though the biggest of them have a decade of

experience, increasing participation, and investment totaling over US\$210 million. In this viewpoint, we first introduce the slim evidence that exists of the impacts and reach of land access policy incentive (LAPI) programs. Next, we call for further assessment of three major types of LAPIs. At the state level, these include (1) beginning farmer tax credits and (2) easement incentives to help New Gen farmers buy and preserve farmland. At the federal level, we include the Conservation Reserve Program-Transition Incentives Program (CRP-TIP) of the U.S. Department of Agriculture's

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Farm Service Agency. The purpose of evaluation will be to understand more about whom LAPI programs help, what effects they have, and what recommendations can be made to strengthen policy design and program delivery.

Keywords

Beginning Farmers/Ranchers, Conservation, Farm/Ranch Owner, Farm/Ranch Transfer, Federal Policy, Land Access, Policy Assessment, Policy Brief, Socially Disadvantaged Farmers/Ranchers, State Policy

Introduction

Success for new farmers and ranchers depends on their ability to secure suitable land to start and expand their operations. Since most do not inherit their land (Katchova & Ahearn, 2016), they face significant financial and socio-cultural obstacles to buying or leasing any (Inwood, 2013). Therefore, land access is significant challenge, as American Farmland Trust (AFT) (Freedgood & Dempsey, 2014), the Council on Food, Agricultural and Resource Economics (C-FARE; 2017) and many others from the U.S. Department of Agriculture (USDA)'s Economic Research Service (Ahearn, 2013) to the National Young Farmers Coalition (Ackoff, Bahrenburg, & Shute, 2017) widely report. Mostly managing small operations, new farmers face long odds (Ruhf, 2013) given farm consolidation (MacDonald, Hoppe, & Newton, 2018), rapid appreciation of land values (Key & Burns, 2018), conversion of agricultural lands to development (Sorensen, Freedgood, Dempsey, & Theobald, 2018; USDA Natural Resources Conservation Service [NRCS], 2018), and a tight supply of available land to rent or to purchase. As an indication of tight supply, the USDA estimated that while 10% of agricultural lands would change ownership between 2015 and 2019, only 2% would be on the open market (USDA National Agricultural Statistics Service [NASS], 2015), leaving 98% of agricultural lands inaccessible to nonfamily members. These factors converge to favor large farms, family members, and established operators at the expense of New Gen farmers (Burns, Key, Tulman, Borchers, & Weber, 2018).

Unequal access plays out in the numbers, both

in terms of access to participation in agriculture and access to ownership. More than six times as many primary producers are age 65 and older as those under age 35 (USDA NASS, 2019a), which stands in stark contrast to the general workforce, where more than six times as many people under age 35 are employed as those over age 65 (Bigelow, Borchers, & Hubbs, 2016). Further, more than 69% of the agricultural land owned by non-operator landlords is owned by seniors aged 65 and older (Bigelow et al., 2016). Pairing these numbers illustrates the urgent need for policy interventions to facilitate younger producers' access to participation and ownership, through land transfer and land access for new farmers and ranchers.

Policy Responses to the Scope of the Problem

Recognizing this need, the federal government and several states have created a variety of financial incentive programs. While their approaches differ, their motivations are similar: to revitalize rural communities (Hamilton, 2011; Meuleners, 2013) and to catalyze land transfers to new producers—whether they are descendants of multigenerational farm families or first-generation farmers and ranchers (Carolan, 2018; Clark, Inwood, & Sharp, 2012). The incentive programs define new producers according to how long they have farmed or ranched, and/or their net worth or age. Some incentives also aim to facilitate access for entering farmers and ranchers who are from racial and ethnic groups that have traditionally experienced discrimination in the U.S. (USDA Farm Service Agency [FSA], 2019b). To focus our analysis on the policy incentives and the producers whose land access they prioritize, we use the term “New Gen” to refer to young, beginning, and/or socially disadvantaged farmers and ranchers.

Interest in these financial incentive programs is growing rapidly. In 2017, both the Maryland Next Gen Farmland Acquisition Program and the Minnesota Beginning Farmer Tax Credit (BFTC) were passed into law. After its first eight months, the Minnesota program had received 300 complete applications (M. McDevitt, personal correspondence, September 13, 2018), suggesting pent-up demand. These numbers add to the state's 37,000

acres (15,000 hectares) enrolled in the Conservation Reserve Program-Transition Incentive Program (CRP-TIP) of the USDA Farm Service Agency, through which 326 more owners are transferring operations and/or land to New Gen farmers. Notably, Minnesota’s BFTC managers observe almost no overlap in participation between the two programs (M. McDevitt, personal correspondence, May 30, 2019). Since 2017, two additional states have proposed (Ohio, Oregon) and three have even passed (Colorado, Kentucky, Pennsylvania) incentives of their own, and the 2018 farm bill increased CRP-TIP funding to US\$50 million, from \$25 million in 2008 and \$33 million in 2014 (National Sustainable Agriculture Coalition, 2014). Meanwhile, participation in the longer-standing BFTC programs has accelerated: Iowa’s numbers nearly tripled from 2013 to 2017 (S. Ferguson, personal communication, September 19, 2018), and applications to Nebraska’s program have increased six-fold since 2008 (Beck, Carter, & Circo, 2018).

Despite the upsurge of interest in financial incentive policies, little is known about their characteristics, impacts, and reach (Schilling, Esseks, Duke, Gottlieb, & Lynch, 2015; Valliant, Ruhf, Gibson, Brooks, & Farmer, 2019). Given the critical need to facilitate land transition and access to land, it is our view that these policies should be assessed together as a body of Land Access Policy Incentives (LAPIs). In addition to an assessment, we believe there is a need to build a community of practice to examine, improve, and advance them, starting with three major types of LAPIs (presented in Table 1). These categories are the highest prior-

ity because the federal and state governments have awarded them over US\$210 million in funding but have conducted little evaluation.

Two approaches to LAPIs compensate landowners for choosing a New Gen farmer as the farm’s next operator or buyer. These include BFTCs in three Midwestern states and the federal CRP-TIP program. Through state-level BFTC programs, landowners earn a credit on their state income taxes. Through CRP-TIP, landowners with expiring CRP contracts earn two additional years of payments in exchange for renting or selling their land to a New Gen farmer (USDA FSA, 2019b). The third type of LAPI program provides financing to the Next Gen farmer directly; two state agricultural easement incentive programs in the Mid-Atlantic region have helped 53 young and beginning farmers obtain financing to purchase and protect high-quality farmland. Here we do not address incentives that some counties or localities offer, private mechanisms, and a longstanding federal-state incentive, the Aggie Bond, which serves mainly banks and other lenders that provide credit to New Gen farmers and ranchers (Williamson & Katchova, 2013).

LAPIs’ participation numbers stand out among a range of mechanisms that aim to facilitate land transition and access. Related policy and programmatic interventions such as Land Link programs often attract very few landowners with agricultural assets to transfer, sometimes too few for the programs to function (Hersey & Adams, 2017; Ruhf, Jaffe, Cosgrove, & Eliot, 2012; Valliant et al., 2019). LAPIs appear to be an exception. Yet while participation is high in some places, utilization is

Table 1. Classes of Land Access Policy Incentives (LAPIs)

Policy level	Policy name	Incentive mechanism
State (IA, KY*, MN, NE)	Beginning Farmer Tax Credit (BFTC)	Generally, owners who choose a beginning farmer as their next operator or buyer earn a credit on state income taxes.
State (DE, MD, PA*)	Next Gen and Young Farmer Easement Incentives	The state provides financing to help young or beginning farmers purchase land and protect it with an agricultural conservation easement.
Federal	Conservation Reserve Program-Transition Incentives Program (CRP-TIP)	An owner whose land is expiring out of CRP earns two additional years of payments upon choosing a beginning or socially disadvantaged farmer as the land’s next operator or buyer.

* New LAPI programs as of 2019–2020

uneven. BFTCs typically use less than the full tax credits allocated to them on an annual basis (Tidgren, 2017). CRP-TIP is well used in some states, but half the states have had no participation at all (USDA FSA, 2019a). Table 2 presents the range of participation numbers by state.

Analyses of barriers to land access and farm/ranch transfer (Valliant et al., 2020) and policy responses often call for more states to emulate existing state LAPI policies (Ackoff et al., 2017; Meuleners, 2013) and for the federal government to continue to expand investment in CRP-TIP (Calo & Petersen-Rockney, 2018; Slack, 2013). The USDA Advisory Committee on Beginning Farmers and Ranchers Land Tenure Subcommittee (2015) similarly recommended a scale-up of state-level LAPIs to the federal level. LAPIs win these endorsements because of their promise to stimulate owners to lease or sell their operations to New Gen farmers and ranchers, and thereby encourage new family farms and new rural enterprise (e.g., National Farmers Union, 2019). However, these calls to replicate and expand existing LAPIs are issued in a virtual vacuum of evidence of the incentives' effects.

Of the three types of LAPIs, the only research has been conducted on BFTCs and one four-state assessment of the national CRP-TIP (Johnson, 2017). Building on this early research, which suggested slight positive effects on beginning farm prevalence (Williamson & Girardi, 2016) and beginning farmers' persistence in farming (Girardi, 2015), the next step is to understand more about who the LAPI programs help, what impacts they have had, and what recommendations can be made from these findings to strengthen program design and delivery to achieve higher returns for diverse New Gen farmers, landowners, and rural communities.

The Intended Effects of LAPIs

The ability of a New Gen producer to enter and succeed in agriculture is vital to the economic and social health of rural communities, and these are the outcomes the LAPIs ultimately aim to foster. Not only are there positive relationships between New Gen participation in agriculture and economic outcomes (Lobley & Baker, 2012; Zagata & Sutherland, 2015), but also farms that anticipate New Gen leadership perform better than those without such plans (Chiswell, 2014; Inwood & Sharp, 2012). Secondly, New Gen farmers make an outsized contribution to sustainable agriculture and food systems, being responsible for more than their share of certified organic and direct-to-consumer sales (USDA NASS, 2014).

Landowners face tax and other policy disincentives to transferring their land and operations, and even more so to an unrelated New Gen farmer. They also face personal, economic, and emotional barriers. The result of these forces is that they often delay transitioning ownership until death (Advisory Committee on Beginning Farmers and Ranchers, 2015; Leonard, Kinsella, O'Donoghue,

Table 2. Approximate Numbers of Incentive Contracts by State and Class of Land Access Policy Incentive (LAPI)

LAPI	LAPIs (Number of unique, cumulative contracts as of 2019/2020)			
	BFTC/D	Easement	CRP-TIP	Total
Colorado*	0	~	54	54
Delaware	~	35	0	36
Iowa	2,957	~	127	3,084
Maryland	~	18	0	18
Minnesota	912	~	326	1,238
Missouri	~	~	79	79
Montana*	0	~	218	218
Nebraska	439	~	132	571
North Dakota	~	~	210	210
Oregon	~	~	45	45
Washington	~	~	109	109
Others	~	~	0-25	5,881

Sources: Beary, personal communication, July 12, 2019; Beck et al., 2018; McDevitt, personal correspondence, June 25, 2019; McHenry, personal correspondence, April 20, 2020; USDA FSA, 2019a.

* Colorado and Montana technically have Beginning Farmer/Rancher Tax Deduction incentive policies, but they have attracted no participation (W. Anseth, personal communication, July 11, 2019; J. Rubingh, personal correspondence, May 23, 2019).

Farrell, & Mahon, 2017; Mishra, Durst, & El-Osta, 2005). If they do hand over the reins during their lifetimes, they typically choose an heir or a well-established producer (Goeller, 2001; Ruhf, 2013). These two common patterns—delay and transferring to an established farmer—impede access to land for New Gen farmers.


LAPIs aim to shift owners' decisions to create access for New Gen producers by addressing the economics of this problem. They also seek to improve equity in land access and rural sustainability. For example, CRP-TIP compensates owners who lease or transfer to a socially disadvantaged farmer (Key & Lyons, 2019), referring to women and farmers of races and ethnicities that have faced discrimination (Horst & Marion, 2019). These include African American farmers, who, after systematic and well-documented dispossession of lands (Horst, 2019), now make up less than 2% of farmers, as well as the growing population of Latinx farmers, who make up about 3% (USDA NASS, 2019b). Even though people of color make up 26% of the U.S. population and 62% of farm laborers, only 3% of agricultural landowners are people of color (Horst & Marion, 2019). Women, half the population, make up only 24% of agricultural landowners. However, despite being designed to improve equity for underserved populations, an analysis of CRP-TIP in four states found that none of these states' approximately 480 New Gen participants were socially disadvantaged farmers (Johnson, 2017). Understanding the reasons for this failure and ways to remedy it is another reason an assessment of these policies and their implementation is so timely and essential.

Conclusions and Recommendations

Iowa, Minnesota, and Nebraska have invested more than US\$89 million in tax credits to entice farm and ranch landowners to choose New Gen operators and transferees. Delaware and Maryland have invested US\$13 million in land purchases by New Gen farmers. Between the 2008 and 2018 farm bills, the U.S. government will have invested over US\$108 million in CRP-TIP, even though this program has undergone no evaluation. Despite this level of investment in the programs, the participation patterns we have presented reveal critical gaps

about the impacts and effectiveness of the more than US\$210 million invested in LAPIs. To address these gaps, the following questions must be addressed using coordinated sets of mixed and transdisciplinary methods led by researchers in partnership with service providers, and supported, informed, and mutually enriched by a national community of practice:

- Who do LAPI programs help, e.g., what kinds of farms and ranches, farmers and ranchers, and owners, and on what scale?
- What are the patterns of participation and nonparticipation, and what explains them?
- What impacts have LAPIs had, e.g., to what extent and how do they affect landowners' and New Gen farmers and ranchers' interactions and decisions?
- What are the main barriers to outreach and implementation of LAPIs?
- How and to what extent do LAPIs facilitate access to land by New Gen farmers and ranchers, and how can LAPIs' structures and implementation better reach this goal?

Assessment is needed to investigate the utilization and impacts of these programs, explore participant motivations, and determine what is working and what is not. The results will characterize the efficaciousness of the incentives and suggest revisions to improve them. This contribution will ultimately support policy and decision-makers, as well as funders and investors, in crafting and delivering policy support for land transfers, Next Generation agriculture, agricultural communities, and rural-urban interdependence. 

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VIEWPOINT

Blockchain and the resurrection of consumer sovereignty in a sustainable food economy

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Consumption is the sole end and purpose of all production; and the interest of the producer ought to be attended to, only so far as it may be necessary for promoting that of the consumer. The maxim is so perfectly self-evident, that it would be absurd to attempt to prove it.

—Adam Smith, *An Inquiry into the Nature and Cause of the Wealth of Nations* (1776)

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Introduction

In today's global food system, where the concentration of both economic and political power is self-evident, the maxim of consumer sovereignty is in great need of proof. In Montana, where we live, we have the great fortune to buy grass-finished certified organic beef from a rancher almost literally in our own backyard. We know the supplier of our food not only as a producer, but as a friend. This rancher can easily garner from us, and his other costumers, our preferences. In a sense, we drive the rancher's production methods and pricing. Even though we insist on organic certification, it is largely on the basis of trust and friendship that we

Authors' Note Regarding Implication from COVID-19

This viewpoint was written before the pandemic, but blockchain supply-chain management is likely to become a topic of more importance as we move beyond the pandemic.

return to purchase from him over and over for our family's beef supply.

Our local oligopolistic supermarket chain¹ also carries certain cuts of grass-finished certified organic beef. When we purchase our beef there, we have no sense of where and who produced the beef. Furthermore, we do not know how much of the price we pay ultimately ends up in the hands of the rancher who produced it. We have little reason to trust that this price is fair to that rancher.

What if recent developments in information technology could provide us the assurance of not only knowing the how, who, and where of our certified organic grass-finished beef, but also of the fairness of return to the rancher? Would we as consumers utilize this knowledge? Would we prefer products in which fairness of return to the producer is known over products where return to the producer is unknown? Would we purchase products from local producers over products whose origin is unknown? Would this information alleviate the real problems of concentrated economic and political power in our food system? Could technology restore customer sovereignty? According to some, blockchain technology could turn out to be a disruptive technology that not only increases efficiency and reduces costs, but also changes the way food is distributed and consumed (Constantinides, Henfridsson, & Parker, 2018; The Economist, 2015).

What Is Blockchain?

One good and fairly recent (2016) definition of blockchain is:

a distributed database of records, or public ledger of all transactions or digital events that have been executed and shared among participating parties. (Crosby, Nachiappan, Patanayak, Verma, & Kalyanaraman, 2016, p. 8)

While this seems fairly straightforward, putting these ideas into practice is complicated. There are two important elements in the above definition of

blockchain technology.

First, blockchain is a distributed database, often referred to as a distributed ledger system of transactions or digital events. In the case of a food supply chain, each party in the supply chain can add transactions into a "ledger" of information. Example transactions are "birth of calf #7888231 on ranch #5555 on dd/mm/yy," "loading of yearling #7888231 from ranch #5555 onto transport #6666 on dd/mm/yy," and "arrival of yearling #7888231 at processing facility #7777 on dd/mm/yy." Each actor involved in supplying a product to a consumer adds their transaction, via manual data entry, a cow tag reader, or some other type of sensor, to the ledger. No one actor is required to "own" the ledger. Instead, the ledger tracks the supply chain, so that all actors can interact with it, and, to the extent that correct data is entered, consumers can see the process that led to bringing that product to their shopping basket. Some assert that the blockchain distributed ledger systems enhance complex supply chain management while creating trust-embedded systems with increased transactional efficiency and transparency. This allows consumers greater access to highly differentiated and identity-preserved products whose provenance is clear and trusted (Jouanjean, 2019; Hawlitschek, Notheisen & Teubner, 2018). Recent authors also claim that blockchain can clarify how economic value is shared from farmer to consumer (Tripoli & Schmidhuber, 2018). It is this point that is most relevant to consumer sovereignty.

Second, blockchain allows sharing among participating parties, but once ledger values are entered, participants cannot change them. This inability to alter ledger data is referred to as immutability. This provides the security of the blockchain, so much so that blockchain is the technology behind several crypto-currencies such as Bitcoin.

The term "cryptology" is similar to the idea of a secret code. Each transaction in the blockchain supply-chain is both verified by other members (known as a *distributed consensus*) and protected by an

¹ The average market share of the top four food retailers (known as CR4) was 63% for 2014 across 27 U.S. Metropolitan Statistical Areas (Ma, Saitone, Volpe, Sexton, & Saksena, 2019). A CR4 greater than 60% demonstrates significant market power where these four firms may coordinate prices and output, creating an oligopolistic market (Connor, Rogers, Marion, & Mueller, 1985).

embedded security system (Casado-Vara, Prieto, De la Prieta, & Corchado, 2018). Thus, it is very easy to trace where a break or misinformation in the blockchain system has occurred and, at the same time, very difficult for any member within or outside of the blockchain to hack into the information being exchanged.

The idea of a *public* ledger in this definition is a bit of a misnomer. Whether the information within a blockchain is public is, of course, dependent on what the blockchain is being used for. One major retail supermarket chain uses blockchain for traceability of produce through its complex supply chain. However, the information embedded in the blockchain is not for general public consumption, nor even necessarily for the farmer providing products to the food retailer. These are referred to a *permissioned* blockchains (VeChain, 2020). On the other hand, other blockchain systems are purposefully public in nature. For example, an innovative blockchain system called BeefChain² is explicitly public so that the beef consumer can buy identity-preserved Wyoming beef from a select set of ranchers. Even here, not all information collected within the blockchain is public. However, if consumers increasingly demand information concerning the safety of their food, its origin, and the sustainability of the processes that have produced and delivered it, blockchain technology may be gaining momentum in food supply chain management and product promotion (Schahczenski, 2019).

Beyond Traceability to Full Transparency

The use of blockchain for food safety and general supply-chain management has been the topic of several research efforts (Galvez, Mejuto, & Simal-Gandara, 2018; Sander, Semeijn, & Mahr, 2018). Part of the discussion here regards whether blockchain technology can assist with the many confusions that are created by a proliferation of labels. Also, can the consumer “trust” labels? When a meat product is labeled “grass-fed,” is the consumer sure that, in fact, the ruminant was grass-fed its entire life? The claim by these researchers is that blockchain technology can “solve” this problem by

“ensuring credible and reliable product information through the entire meat supply chain, from farm to fork” (Sander et al., 2018, p. 2079).

Blockchain applied to supply chain management has also been studied in relation to transaction costs. Through blockchain technology, transaction costs can likely be lowered and therefore create greater economic value (Mettler, 2016). While similar to the broader topic of “smarter and more accessible data and market information,” traceability and identity preservation blockchain efforts are an intentional effort to use blockchain as a disruptive technology (Tripoli & Schmidhuber, 2018).

One recent agricultural example of this “disruption” is the claim by a start-up Canadian firm, Grain Discovery, in executing the first field corn transaction using blockchain (Grain Discovery, 2019). The transaction was interesting because the original sale of the corn in question was rejected by the farmer’s traditional buyer because it tested for a slightly high level of vomitoxin (caused by mold on corn). Grain Discovery was able to facilitate a new buyer quickly using its blockchain platform. More broadly, Grain Discovery claims that it is:

focused on untangling the complicated supply chain paths for grains. The Grain Discovery platform gives more control to both farmers and buyers and has endless applications, from allowing consumers to see the path their food travelled, to calculating the carbon intensity behind the production of food and biofuels. (Grain Discovery, 2019, para. 7)

But this disruption of making clear the provenance of products through complicated agriculture and food supply-chains more transparent to end buyers and consumers does not often include discussion of how economic value flows through these same blockchain systems. Wouldn’t economic value transparency be even more disruptive than simply knowing how and where my Thanksgiving turkey was produced and how it was slaughtered, processed, transported, and handled before I purchased it?

² <https://beefchain.com/>

Fair Trade and Blockchain

The fair trade movement has tried for many years to improve the relative economic power and viability of very poor small farmers in developing countries. While they have used label programs and other efforts, blockchain appears to be a natural fit for this movement. Indeed, a new effort by the Fair-Chain Foundation is undertaking just such an effort with coffee growers in Ethiopia (Academics for Development, n.d.). This project allows consumers of this coffee to see verified data on the difference between the local market price that the producer would have received for the coffee, and the actual and improved price received by the farmers entering into the fair trade arrangement of this project. By using a brand developed App and scanning a QR (Quick Response) code on the final product, a consumer living thousands of miles away can verify the real economic benefit to the coffee farmer from their purchase.

While this project represents a major step up in expanding blockchain to a better reckoning of economic value through a complex food supply chain, the economic benefit is dependent on the unique case of a specific brand of a very high-end, single-origin coffee that can command a higher price differential. It seems that the fair trade movement may not have yet fully embraced blockchain technology, and it appears to hold to a somewhat narrow understanding of the full potential of the technology. In a 2019 Fairtrade Foundation blog post, Catherine Thompson warned of a need for a maturing of the technology. However, she did see the possibility of blockchain for “democratizing the information in [food] supply chains” (Thompson, 2019). She went on to say:

Farmers often have to share lots of information about themselves but don't receive any information in return. If systems were built in the right way, it [sic] could support farmers to understand the journeys their crops take—potentially helping them to better manage their customer relationships and risks—and ultimately become more resilient. (Thompson, 2019, para. 5)

Could the economic and ecological resiliency

of the Ethiopian coffee farmer just be a matter of an information imbalance corrected by blockchain technology?

Summary: Sovereignty Regained?


One of the major blockchain platforms claims that blockchain is a technology that “will only thrive and achieve mass adoption if it can add value to businesses and make the world a better place.” (VeChain, 2020). Does a better world include an outcome where consumers can express new sovereignty over the production of food controlled by powerful political and economic actors in the global, national, and even local food systems? The Ethiopian coffee grower's case suggests that this may be possible.

Many food and agriculture companies still use information systems, supported by centralized databases, to effectively track significant aspects of their processes and products. Blockchain technology shines when processes involve multiple organizations. Confusion as to where the product contamination occurred and the ability to find “niche” markets for contaminated grains in the case of Grain Discovery, and even the carbon intensity behind grain production, cannot easily be captured by a single centralized database.

We suggest that blockchain technology has the potential to be a truly disruptive technology if attention is placed on sharing economic value from farmer to consumer. While not needed when one is close to the actual producer of their food, where trust does not need to be embedded in a blockchain, most consumers are separated from the production and may appreciate knowing more about the farmer or rancher. Whether local and regional food systems can utilize the blockchain to choose to support producers will be a function of its cost to implement and, more importantly, whether customers in these systems will pay the needed higher price to fully reward the farmers and rancher who participate in that food system.

How interesting would it be if sitting down at our local restaurant or, better yet, our local fast-food chain, we could take out our smartphones and read a code on the menu that would provide not only truthful information about how our food was raised, but how much of the value we pay for

the item is returned to the farmer? Could a new era of product competition be emerging where we can buy products for multiple important values, including supporting our local and regional economy and the farmer or rancher who did the bulk of the work to provide us with something so very good? Perhaps we need to reassess what is both the real and

just price of food. Maybe blockchain technology could help enormously with that assessment. We share with others the hope that blockchain will change “the perception of value” and that “within a certain techno-economic context, is instrumental to unlock the potential for societies to prosper” (Pazaitis, De Filippi, & Kostakis, 2017, p. 106). 

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Government extension, agroecology, and sustainable food systems in Belize *milpa* farming communities: A socio-ecological systems approach

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Abstract

The sustainability of *milpa* agriculture, a traditional Mayan farming system in southern Belize, is uncertain. For centuries, the *milpa* has been a sustainable agriculture system. The slash-and-burn aspect of *milpa* farming, however, has become less reliable and less sustainable over the last 50 years due to several factors, including forest loss, climate change, population growth, and other factors. The traditional *milpa* practices of slash-and-mulch and soil nutrient enrichment (nutrient cycling) are agroecological practices that produce food in a more sustainable way. Agriculture extension, a government service in Belize, can promote additional agroecological practices to address food and liveli-

hood insecurities in *milpa* communities. This study examines perceptions of these practices from *milpa* farmers and agricultural extension officers in Belize using a socio-ecological systems (SES) framework. SES considers multidisciplinary linkages, including social, economic, environmental, cultural, and other factors in the agroecological system. The study finds several of these SES linkages between agroecological practices—specifically slash-and-mulch and soil nutrient enrichment—and the sustainability of the *milpa* farming system in southern Belize. *Milpa* communities are part of the broader SES and therefore are affected by changes to it. *Milpa* communities can also be enabled and participate in solution-finding. The findings imply that increasing the use of agroecology practices in *milpa* communities is needed and that government involvement and action, particularly from agriculture extension services, can facilitate a more sustainable *milpa* farming system and therefore more food and livelihood security in *milpa* communities in Belize.

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Keywords

Agroecology, Socio-Ecological Systems, Extension, Belize, *Milpa* Farming, Food Security, Sustainability

Introduction

The sustainability of milpa agriculture, a traditional Mayan farming system in southern Belize, is uncertain. A milpa is a small-scale subsistence farming system of shifting cultivation (Downey, 2009; Nigh & Diemont, 2013), which traditionally involves slash-and-burn or slash-and-mulch techniques (Johnston, 2003; Thurston 1997). The milpa is a significant aspect of Maya culture; Maya identity, ceremony, community, and livelihood are all rooted in the milpa (De Frece & Poole, 2008; Falkowski, Chankin, Diemont, & Pedian, 2019). For centuries, the milpa has been a sustainable agriculture system (Altieri & Toledo, 2011; Benitez, Fornoni, Garcia-Barrios, & López, 2014; Ford & Nigh, 2016; Nigh & Diemont, 2013) by allowing areas to regenerate, creating a mosaic of forest succession stages and crop diversity, and providing major food sources and livelihoods for Maya milpa farmers (Daniels, Painter, & Southworth, 2008; Isakson, 2007; Mt. Pleasant, 2016; Shal, 2002).

The slash-and-burn aspect of milpa farming, however, has become less reliable and less sustainable in the last 50 years due to forest loss, soil degradation, climate change, population growth, land tenure, poverty, and other factors (De Frece & Poole, 2008; Levasseur & Olivier, 2000; Lozada, 2014; New Agriculturist, 2005; Shal, 2002; Steinberg, 1998). Due to this uncertainty, milpa farmers who exclusively practice slash-and-burn in Belize may be more vulnerable to livelihood and food insecurity (Lozada, 2014; Okumu, 2013). Food security is the ability to provide present and future generations with a reliable food supply; it considers multiple factors and depends upon reliable crop production while sustaining a healthy ecological balance in a farming system (ESRI, 2008; Food and Agriculture Organization of the United Nations [FAO], n.d.; Mazumdar, 2008; Rao, Waits, & Neilsen, 2000).

The milpa practices of slash-and-mulch (versus slash-and-burn) and soil nutrient enrichment (nutrient cycling) may be more sustainable in Belize. Slash-and-mulch (i.e., cutting and mulching vegeta-

tion on-site) involves shorter fallow periods and can restore soil nutrients and stabilize yields; soil nutrient enrichment involves farming inputs that improve the soil conditions for production (Johnston, 2003; Mkhize, 2016; Thurston, 1997). Both slash-and-mulch and soil nutrient cycling are agroecological practices. As a science, practice, and movement of producing food in a more sustainable way (Altieri & Toledo, 2011), agroecology involves multidisciplinary factors and a participatory and action-oriented approach to sustainable and just food systems (Méndez, Bacon, & Cohen, 2013; Rivera-Ferre, 2018; Wezel et al., 2009).

Promoting agroecological practices may be necessary to facilitate food and livelihood security in milpa communities. Agriculture extension, a government service in Belize, is in an effective position to enable an increase in agroecological practices in Maya milpa communities (Drexler, 2019). In Belize, extension officers can work within the cultural traditions of the milpa system to facilitate support for increased agroecological practices (e.g., slash-and-mulch) while including farmers as partners in the process. This study examines perceptions of agroecological practices from milpa farmers and agricultural extension officers in Belize using an SES framework. SES considers transdisciplinary factors and linkages, including social, economic, environmental, cultural, governance, and other factors in the agroecological system.

Background and Literature Review

The Milpa Farming System in Belize

A milpa is a small-scale traditional Maya farming system of shifting cultivation. It involves clearing areas of forest to plant primarily corn, beans, and squash on nutrient-rich soil (Emch, 2003; Mt. Pleasant, 2016) for subsistence and selling at local markets (Downey, 2009; Nigh & Diemont, 2013). Milpa farmers traditionally use slash-and-burn and/or slash-and-mulch practices (Johnston, 2003; Thurston, 1997). As a polycrop practice, the milpa is a “diverse and complex agroecosystem that, given its ample diversification and adaptation to local conditions, provides an excellent model system for agroecology” (Benitez et al., 2014, p. 1). The crop diversity of the milpa system can sustainably

“increase the agroecosystem’s productive capacity and resilience” and can therefore promote food security and food sovereignty, the “right to healthy and culturally appropriate foods” (Falkowski et al., 2019, p. 396).

The milpa is a significant aspect of Maya culture and livelihood. In Belize, the milpa system meets most of a family’s need for food, wood, and income (Emch, 2003; Lévasséur & Olivier, 2000). Traditional ecological knowledge of the milpa “is important to the cultural integrity of Maya communities and the ecological integrity of tropical [and subtropical] lowland ecosystems” (Falkowski et al., 2019, p. 400). The milpa has been a sustainable agriculture system; as a forest mosaic of disturbance, there is “long-term carbon sequestration and an increasingly fertile anthrosol and enriched woodland vegetation” (Nigh & Diemont, 2013, p. 45). However, the milpa system is “not indefinitely resilient, particularly in an era of global economic and environmental change” (Lozada, 2014, p. 75).

Slash-and-burn. As a traditional milpa practice, the slash-and-burn aspect of milpa farming (clearing and burning small areas of forests for crop rotation each year) has been misunderstood as having large-scale impacts on forests. This practice has been sustainable for centuries and has only recently (in the last 50 years) begun to be unsustainable in combination with climate change, forest loss, soil degradation, population growth, and other factors (De Frece & Poole, 2008; Lévasséur & Olivier, 2000; Lozada, 2014; New Agriculturist, 2005; Shal, 2002; Steinberg, 1998). The burning aspect of milpa farming reduces carbon stocks, and the intense heat during burning can destroy critical root and seed banks (Uhl, 1987). Also, the practice of burning means fewer nutrients are returned to the soil, water-holding and nutrient status declines, and “risks of accelerated erosion, water runoff, and crop failure in times of below normal rainfall” (Kidd & Pimental, 2012, p. 112) dramatically increase. Degraded natural resources negatively affect the rural poor (John & Firth, 2005), which “has major impacts [on] the ecology, economy, food security and public health of the [Belizean milpa] communities” (Chicas, Omine, & Ford, 2016).

Slash-and-mulch. Slash-and-mulch, practiced

by about half the milpa farmers in the Toledo District (Drexler, 2019), is a traditional milpa practice where vegetation is cut and left to decompose. Mulch practice has been found to be far more beneficial in tropical regions by restoring degraded soils, providing shorter fallow periods, stabilizing crop yields (Johnston, 2003; Mkhize, 2016; Thurston 1997), and having similar planting and harvest timing, although tillage may be slower compared to slash-and-burn (Erenstein, 2003).

There may be disadvantages to slash-and-mulch practice, including a possible increase in snakes or animal vectors. Also, there may be a need for fertilization inputs in mulch systems, although that is debated in the literature. For example, one study states, “Fertilization is essential to obtain acceptable yields under fire-free land preparation” (Denich, Vlek, de Abreu Sá, Vielhauer, & Lücke, 2005, p. 51), but the study suggests the increased yields will compensate for fertilizer costs. Another study finds that external fertilizer inputs (as well as weeds and runoff) were avoided with mulching, and “increased SOM [soil organic matter] and water holding capacity were also achieved” (Lozada, 2014, p. 62). In other studies, mulching was found to improve soil nutrients and regulate surface temperatures (thus improving moisture and germination) as well as other benefits for crop productivity (Johnston, 2003; Mkhize, 2016; Thurston 1997).

Agroecological Practices in Belize

In Belize, “mixed intercropping, organic nutrient recycling processes, crop rotations, and irrigation facilities” (Government of Belize [GOB], 2003, p. 53) help to decrease pressure on deforestation while simultaneously increasing domestic production. Other methods of agroecology in farming systems include polycultures, agroforestry, using native seeds, and “encouraging natural enemies of pests, and using composts and green manure to enhance soil organic matter thus improving soil biological activity and water retention capacity” (Altieri & Toledo, 2011, p. 588). A diversified agroecological system promotes sustainability and resilience through biological interactions, soil fertility regeneration, crop productivity and protection, and recycling nutrients and energy on a farm rather than using external inputs (Altieri & Toledo, 2011).

Promoting agroecological practices can facilitate food security while maintaining the health of ecosystems (FAO, n.d.).

Socio-ecological Systems (SES) in Belize

This study uses an SES framework to examine perceptions of agroecological practices from milpa farmers and agricultural extension officers in southern Belize. SES considers multidisciplinary linkages, including social, economic, environmental, cultural, and other factors in the agroecological system. The SES framework is an effective lens through which to study the complex and multidisciplinary issue of sustainable agroecological practices in milpa communities.

An SES is a linked network where an impact on one part of the system—loss or degradation of soil, for example—can affect human systems such as food security and farmer livelihoods (Lal, 2008; Lévasséur & Olivier, 2000; Molnar & Molnar, 2000). Understanding each factor, as well as how it functions in the “complex whole” (Koutsouris, 2008, p. 269), is important.

Milpa communities are part of the broader SES and therefore are affected by changes to it; they experience system impacts and can be more vulnerable to increasing resource loss and degradation (Drexler, 2017; Flint, 2015; Okumu, 2013; C. A. Young, 2008). For example, as milpas expand deeper into forests, the ecosystem on which milpa farmers depend for their basic needs is affected (Lozada, 2014). With resource loss, there are implications for food and livelihood insecurity for milpa communities. That said, as part of the broader SESs, milpa communities can also be enabled and participate in solution-finding.

Dr. Elinor Ostrom is widely considered to be the foremost researcher on SES. Ostrom’s conceptual framework uses a multilevel and multiperspectival examination of SES (e.g., social, economic, political) drivers, interactions, and outcomes. Ostrom’s framework also involves adaptive resource management, coordinating with multiple stakeholders, collective action, self-organizing, and bottom-up (community-based) application of resource planning and management (Olsson, Folke, & Berkes, 2004; Ostrom, 2009; Parrott, Chion, Gonzalés, & Latombe, 2012).

SES challenges associated with milpa farming system sustainability can be described as “wicked” problems. Wicked problems are difficult to solve and are often complex, multidimensional, dynamic, difficult to recognize and find causality for, and connected within other problems (Hanstedt, 2012; Rittel & Webber, 1973). Systemic issues such as food security and agriculture sustainability necessitate inclusive and “wicked” approaches (i.e., community-based, multiperspectival, and flexible system frameworks) to address problems.

Agriculture Extension in Belize

In Belize and elsewhere, one of the most effective ways to promote an increase in sustainable agroecological practices is through agriculture extension services. Extension has a strong institutional expectation as a conduit of informing, educating, and facilitating best practices for farmers (SeEVERS & Graham, 2012). Extension programs can build resilience in milpa systems through multidisciplinary capacity-building and farmer participation (Ministry of Agriculture, Fisheries, Forestry, the Environment, Sustainable Development and Immigration, Government of Belize [MAFFESDI], n.d.) using “site-specific technologies [which] should include intensified water management strategies, slash-and-mulch technologies, grain-based intercropping and agroforestry techniques to increase and stabilize yields” (Lozada, 2014, p. 81). To improve agroecological sustainability, extension can promote “more resilient farming systems and practices, as well as sound coordination, exchange of information, methodologies, and tools between experts and institutions” (FAO, 2010, para. 12). Also, extension can “generate better social and environmental benefits” (Tandon, 2014, p. 8) and facilitate resource sustainability, a more sustainable milpa farming system, and food and livelihood security in Belize (Benitez et al., 2014).

The director of extension in Belize stated that farmer field schools (FFS) are one of the most effective extension collaboration models used in Belize, providing “empowerment and facilitation for [farmers] to [learn how to] solve their own problems” (B. Esquivel, personal communication, September 26, 2017). FFS is a participatory approach conducted in the farming community to “increase

agricultural production and improve livelihoods in a way that is adapted to local contexts” (FAO, 2015, para. 11). One officer explained that both extension officers and farmers work side by side to solve problems in real time; when a problem is found, everyone participates as partners, “adapts,” and “finds a solution” (V. Kuk, personal communication, January 14, 2019).

Applied Research Methods

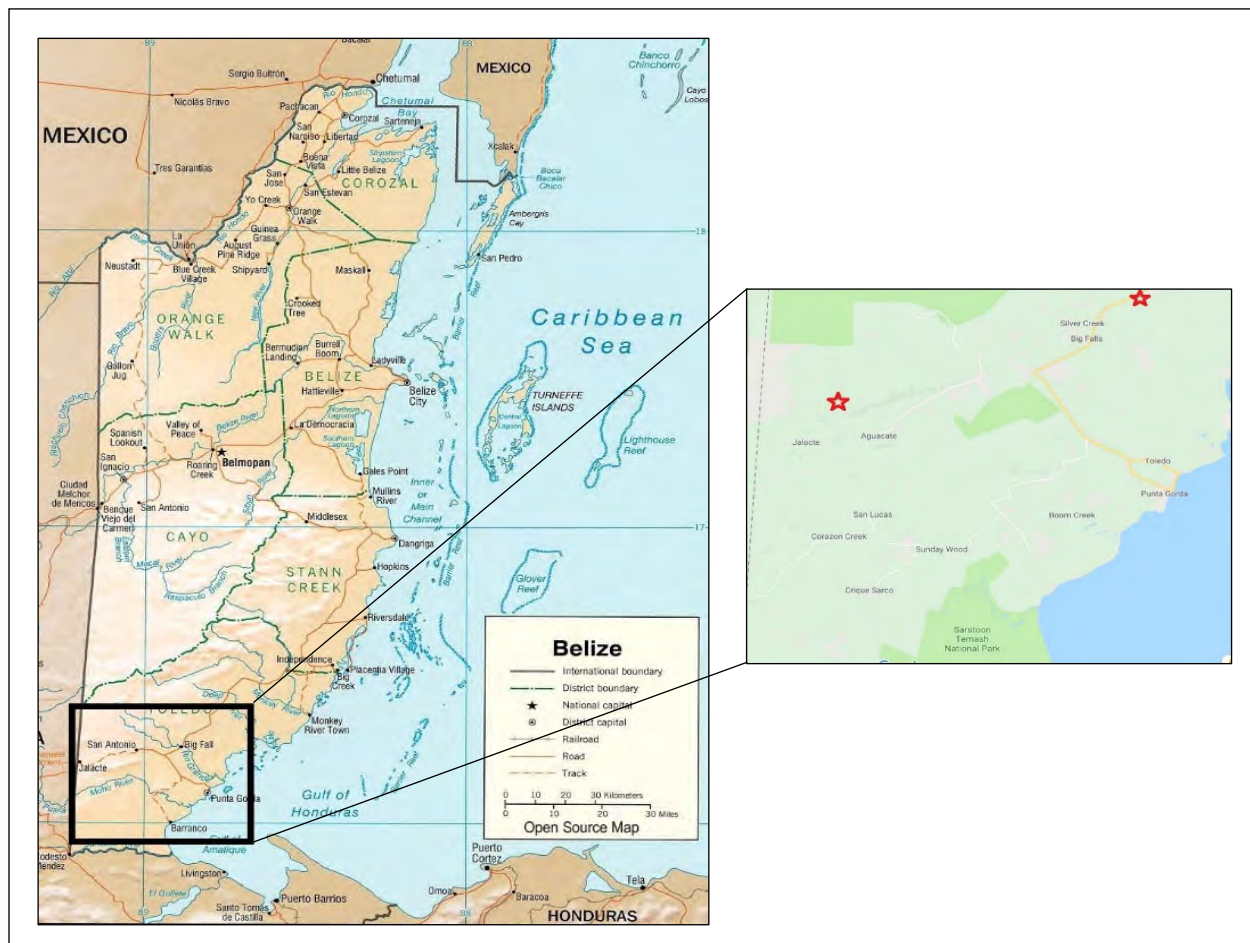
This qualitative study uses phenomenology and semistructured interviews to describe the common lived experience of milpa farming sustainability from the perceptions of milpa farmers and extension officers. Phenomenology recognizes patterns, categories, and themes that emerge from the data collected in interviews (Creswell, 2013; Gall, Gall,

& Borg, 2007; Ravitch & Carl, 2016). The American Public University System Institutional Review Board (IRB) approved all study protocols and interview questions; all interviews followed a voluntary and informed consent procedure.

Setting of the Study

Semistructured interviews were conducted of five milpa farmers and three extension officers in the Toledo District. Toledo District is the southernmost district in Belize; its population is nearly 50% Q’eqchi’ (Kekchi) Maya, 20% Mestizo, and 17% Mopan Maya. There are also Garifuna, Creole, East Indian, and Mennonite populations (Statistical Institute of Belize [SIB], 2018). Farmers in two milpa villages in Toledo District, Pueblo Viejo and Indian Creek, were interviewed (Figure 1).

Figure 1. Map of Belize Showing Study Sites



Sources: At Ease in Belize Ltd., n.d.; Google Map of Pueblo Viejo (left) and Indian Creek (right) villages (2019).

In milpa farming communities, households were selected using a stratified random design in each village. Sampling was purposive using the subpopulation of ‘primary (head) milpa farmer’ for each selected household. The subpopulation was intentional to elicit the perspective of farmers who have the most direct knowledge of local forests, soils, and agriculture systems. Two of the farmers randomly selected were Maya cultural and political leaders in their villages; they spoke to the importance of the milpa as part of their cultural practice. In-depth interviews of extension officers were also conducted in both office and field settings; three (of the four total) extension officers in the Toledo District in southern Belize were interviewed. Interviews for both groups included questions on the sustainability of farming practices and SES impacts in milpa farming communities.

Data Analysis

A series of open (analytical), axial (reduction and clustering of categories), and selective coding (the intersection or integration of categories) processes were used (Creswell, 2013; LeCompte, 2000; Pereira, 2007; Ravitch & Carl, 2016; Strauss & Corbin, 1994). The SES dynamics regarding sustainability in the slash-and-mulch and soil nutrient enrichment practices of traditional milpa farmers were examined. Emergent dominant themes were found to intersect with several multiperspectival SES indicators.

Results

Results from the qualitative approach include perception data from semistructured interviews of five milpa farmers and three extension officers. Two emergent thematic categories (codes) linked to the sustainability of the milpa farming system were identified: (1) Slash-and-mulch, and (2) soil nutrient enrichment practices. These agroecological practices were expressed by both milpa farmers and extension officers as having (a) economic, (b) environmental, and (c) cultural linkages to sustainable agroecological practices in milpa communities of southern Belize.

Milpa Farmer Perspectives

All milpa farmers interviewed for this study de-

scribed their farming system as including slash-and-burn farming. Some farmers also use slash-and-mulch and soil enrichment practices. Slash-and-mulch with no burning was considered by interview participants as a “new” farming technology, although mulching has been a traditional practice of milpa farming for centuries (Thurston, 1997). Slash-and-mulch milpa farming involves cutting trees and other vegetation for farm plots, but instead of burning the debris, farmers allow a decay or mulching process to occur. Mulching and soil enrichment were identified by extension officers and two farmers interviewed for this study as having a positive effect on soil and crop sustainability. Soil enrichment restores health and nutrients to the soil, which are primary needs for milpa farmers to increase productivity sustainably (Ong & Kho, 2015). In the interviews, milpa farmers perceived environmental, economic, and cultural impacts of slash-and-mulch and soil nutrient enrichment practices in the SES.

Environmental perspectives. From an environmental perspective, milpa farmers traditionally cut trees and bushes (referred to locally as “chop bush”) to plant on nutrient-rich “black” soil. Milpa farmers then choose to either burn the chopped debris (slash-and-burn) or leave it to decay (slash-and-mulch). Two farmers interviewed for this study explained the use of fire and crop rotation: “I will soon start to chop bush, and then it dries, and then [I] burn it, and then plant it. You chop more bush to plant more [crops].” Milpa farmers interviewed for this study need to rotate on black soil due to the nutrient depletion in the soil over time. One farmer stated that they need soil enrichment assistance if they are to avoid cutting more forest. A farmer who already practices slash-and-mulch explained that he prefers the slash-and-mulch over burning:

... Not to burn it ... leave it there. Just leave it there, and it’ll get rotten, right, and leave the stump right there, because the stump, it holds a lot of soil; when it’s raining, it won’t flush off. So, just leave the stump right there until it gets rotten.

Economic perspectives. From an economic

perspective, slash-and-mulch and soil nutrient enrichment practices can improve the production and livelihoods of milpa farmers. To reduce costs, some farmers avoid fertilizers through crop rotation. One farmer explained why he rotates crops to use nutrient-rich black soil and how this is sustainable financially because black soil does not require fertilizer input. He explained they chop vegetation for the soil; otherwise, the soil gets too dry and hard, “but, if we change every year, it doesn’t need fertilizer. Yah, just normal planting—organic... That’s why we maintain for [size] we forest.” One study, however, suggested that using fertilizers increases yields enough to more than compensate for fertilizer costs (Denich et al., 2005).

Soil enrichment involves fertilizer inputs (chemical or nonchemical); all farmers interviewed stated they buy and/or use fertilizer inputs. However, adding nonchemical enrichment can be low to no cost. One farmer explained that keeping forests intact is important for his village’s economic development and tourism industry:

We understand the slash and burn is [bad]—sometimes for humans, for us and also for a wildlife—and, so, we are trying to avoid that now. We are working very closely with the village leaders ... because we need to take care of our forest, including creeks, rivers, and streams, and so forth.

Cultural perspectives. As part of the Maya culture and tradition, milpa farmers are taught by family how and when to plant and harvest milpa crops, usually related to rain and moon cycles. In this way, many aspects of the agroecological system are passed down from generation to generation. Some farmers were not interested in learning soil enrichment technology. One farmer stated: “Black soil is better [to farm]. I would chop because that’s what, you know, works for [us] versus using the technology to put nutrients in the soil.” One farmer described going further and further into the forest each year to farm. Two farmers were interested in learning new technologies and adapting their practice. For example, one farmer expressed being interested in effective microorganisms (EM) for soil enrichment:

It would be interesting to bring something with the soil and mix it up—and put plants there like tomatoes. You could plant when you mix up the soil... the [plants] come very good. And, with corn too... Yes, yes – that would be interesting ... interesting. You bring some soil, you just mix it up, and plant some there.

Another stated that exclusively using slash-and-burn, a traditional form of agriculture in southern Belize Maya villages, is not culturally sustainable. He stated:

The only way we could damage [the milpa farming culture] for us is if we continue to slash and burn, and burn, and slash and burn—and, we believe that one day our crop will never come out good again because the fertile[ity] of the ground is washed off, so everything goes in the creeks, in the river; and, the land becomes poor and poor and poor and poor—and, so, now, we don’t want to practice that because we understand the situation there. So, we believe that to maintain the soil, to treat the soil in a proper way... not to cut down the trees or not to burn it—even though if you want to fall something – but, leave it there—just, leave it there, and it’ll get rotten.

Cultural factors are linked to economic and environmental factors. To some farmers, slash-and-mulch can improve the sustainability of the agriculture system (i.e., increasing production, income, and resource sustainability).

Extension Officer Perspectives

The main mission of extension is to promote new agriculture practices, technologies, and innovations (Seevers & Graham, 2012; U.S. Department of Agriculture, National Institute of Food and Agriculture [USDA NIFA], 2019); for southern Belize milpa communities, this includes slash-and-mulch and nutrient enrichment practices. Extension officers interviewed for this study commonly perceived slash-and-mulch farming and soil nutrient enrichment as beneficial to sustainable agroecology practices. Extension officers perceived the environmental, economic, and cultural effects of

these two practices. However, extension officers recognized that there are institutional barriers, including lack of training in new technologies and lack of support from the central extension office. Currently, there are four extension staff responsible for a largely rural district of 52 communities.

Environmental perspectives. One extension officer interviewed for this study stated that mulching instead of burning is “climate-smart” because mulching keeps more moisture and nutrients in the soil, which benefits farmers, whereas burning would expose and heat up the soil, causing nutrient loss. Another officer explained the benefits of leaving the grasses to rot in the mulching process; the grass “covers the soil [and] ... there’s a little moisture by the roots of the plant ... it will keep the soil cool instead of in the hot sun ... so it does work. It does work.” He explained, “The advantage [of slash-and-mulch] is that it improves the soil fertility, but the disadvantage is that it’s too bushy and people don’t want to go in there ... because it attracts maybe snakes and other things.” One extension officer explained that they “need to do a little bit more public awareness in terms of the negative effects [of burning]” due to air pollution, global warming, and other effects, and to show the proof that alternatives (i.e., mulching) work.

Regarding soil nutrient enrichment, extension officers commonly perceived that soil nutrient enrichment and ground cover could be beneficial for farmers. One extension officer interviewed was trying to educate and promote effective microorganisms (EM). He stated, “A lot of farmers, they are starting to use organic material—meaning chicken manure. They are using a lot of EM agriculture to build up the soil fertility.” The same officer also explained the benefits of mucuna beans for nutrient enrichment:

We have some farmers that benefit from the training as well, because, at some point, we introduce some types of fertilizer that you incorporate in the soil ... [for example] mucuna beans: the Mennonites [presuming he means the less mechanized Amish community] use it a lot, you know; they don’t use a lot of synthetic fertilizer, they only use these types of mucuna beans.

Another extension officer explained the benefits of arachis (*Arachis glabrata*), a wild peanut perennial. Arachis is useful for milpa farmers as an effective ground and soil cover and as a nitrogen-fixing plant. Agroecological practices mimic or replicate the nutrient cycling in forest ecosystems while allowing for sustainable production of agriculture (Kidd & Pimental, 2012); extension officers can promote nutrient cycling with increased slash-and-mulch and adding fertility (soil nutrient enrichment) to reduce the need for forest clearing for black soil.

Economic perspectives. There are economic linkages to environmental and cultural factors in promoting sustainable agroecological practices in milpa communities. Extension officers need more support, technical training, and human resources allocated from the central extension office in the capital of Belmopan to prioritize sustainable agroecological practices. One officer noted, “We need support from them, because we cannot do it alone ... We need to prioritize [climate-smart] topics because everything now is climate change ... Everything is focused around climate change and resilience.” To cope with the low numbers of staff, extension officers interviewed for the study need to collaborate with other government agencies and nongovernmental organizations to carry out some aspects of their extension duties.

Cultural perspectives. When asked if the milpa farming system is sustainable, one extension officer answered “no” due to the lack of youth involvement. Another answered “yes” due to cultural traditions and knowledge passed down through generations. The same officer also stated the milpa system would only be sustainable if farmers adapt (i.e., stopped burning). He promoted slash-and-mulch, where farmers “just have to chop and leave it into dry ... and they don’t have to burn.” An extension supervisor in Belmopan suggested that extension officers can work within the cultural traditions of the milpa system to promote effective technologies:

[We need] a way to demonstrate to [the farmer] a way to adequately compensate for what they are moving ... we need to look at injecting proportionate technology in the milpa

system, and then look at how the farmers react to that injection. It's a learning process, not to challenge traditional [farming methods, but try to promote] a few [effective] agricultural practices like soil conservation, irrigation systems, and integrated pest management. (G. Ramirez, personal communications, September 26, 2017)

Discussion

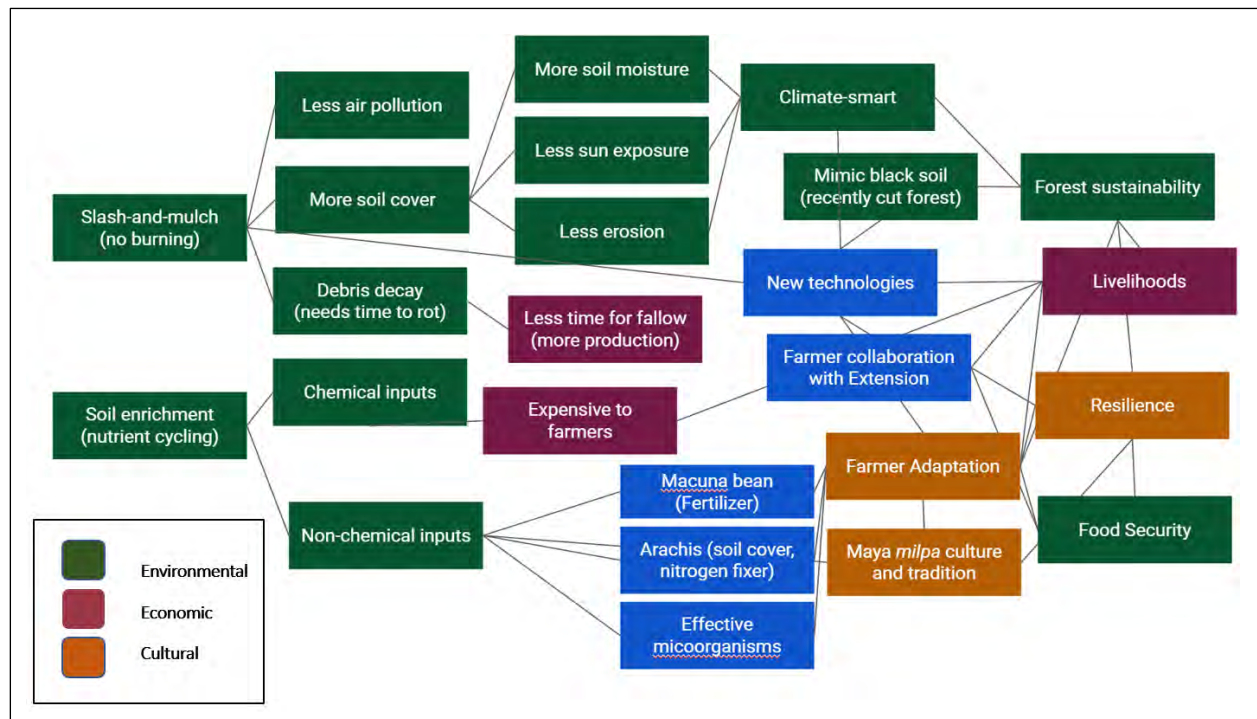
There are positive system impacts from the agroecological practices of slash-and-mulch and soil nutrient enrichment on Maya milpa farming communities. Slash-and-mulch practice (leaving debris to decay on site) has the benefits of soil cover and adding nutrients to the soil. Soil enrichment practice can include adding chemical or nonchemical fertilizers (e.g., chicken manure, mucuna beans, arachis), and integrating effective microorganisms (EM) to break down slashed debris faster and build soil fertility. In interviews, both milpa farmers and agriculture extension officers perceived environmental, economic, and cultural linkages to agroeco-

logical practices. Increasing these practices can enable farmers to achieve food and livelihood security in milpa communities of southern Belize.

Using SES theory, common themes and linkages were interwoven with slash-and-mulch and soil enrichment practices. Both agroecological practices were perceived by milpa farmers and extension officers as conduits for sustainable agriculture in southern Belize. Adapted from Ostrom's model, an SES map (Figure 2), using responses from this study, demonstrates the common themes, linkages, and intersections of environmental, economic, and cultural perceptions of the agroecological practices of slash-and-mulch and soil nutrient enrichment. Implications of increasing the agroecological practices of slash-and-mulch and soil nutrient enrichment practices could foster higher crop production with resource and culture sustainability in a sustainable SES; in turn, this is linked to food and livelihood security for milpa farmers in southern Belize.

The SES model (Figure 2) is intended to be a small picture of an otherwise larger and more com-

Figure 2. A Variation of Ostrom's Socio-Ecological Systems Model, Adapted Using this Study's Perception Data on Environmental, Economic, and Cultural Linkages to Slash-and-Burn and Soil Enrichment Practices in the Milpa Farming System in Southern Belize



plex milpa agroecological system. Other SES linkages could be investigated, including factors such as forest and biodiversity sustainability, climate regulation, health and nutrition of families, inclusion of farmers as partners in the process, encouragement of youth farmers, collective action, stewardship, adaptation, and multiple other system factors.

Agriculture extension is an effective position to promote sustainable agroecological practices in southern Belize because it has a strong institutional expectation as a conduit of informing, educating, and demonstrating best practices for the public. One effective extension method in Belize is the Farmer Field School (Esquivel, 2017); working within milpa cultural traditions, extension can include milpa farmers as partners in the problem-solving process (Drexler, 2019). In this way, extension officers can promote agroecological practices—particularly, slash-and-mulch and soil nutrient enrichment—and address food and livelihood insecurities in milpa communities in southern Belize (Drexler, 2019).


Conclusion

There are positive SES effects from the agroecological practices of slash-and-mulch and soil nutrient enrichment on Maya milpa farming communities in southern Belize. Although slash-and-burn milpa farming has been sustainably practiced for centuries, factors such as climate change, population growth (i.e., increased pressures on forests soils, and crop production), and poverty have made slash-and-burn less sustainable in the last half-century. Traditional milpa practices of slash-

and-mulch and soil nutrient enrichment, however, are perceived to have positive environmental, economic, and cultural SES linkages. Extension officers can promote the increased adoption of the agroecological practices of slash-and-mulch and soil nutrient enrichment to benefit milpa farmers.

The findings of this study suggest that increasing the use of agroecology practices in milpa communities, specifically slash-and-mulch and soil nutrient enrichment, is needed. Further, increasing agroecology practices necessitates government involvement and action—particularly from agriculture extension—to facilitate a more sustainable milpa farming system. Therefore, extension and agroecological practices can positively affect food and livelihood security in milpa communities in Belize.

Recommendations for Research and Practice

Future qualitative, quantitative, and mixed-method studies are recommended. Important recommendations for extension practice include (1) An increase in support for extension services promoting slash-and-mulch and soil nutrient enrichment and other nonchemical technologies (e.g., effective microorganisms, mucuna beans); (2) An increase in extension using a more holistic and SES approach in promoting agroecology practices to include milpa farmers and village leaders as partners; and (3) An increase in farmer field schools (FFS) and youth involvement programs, working within milpa cultural traditions to include milpa farmers as partners in the problem-solving process. 

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Exploring resource management for sustainable food businesses: Three Vermont case studies

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Abstract

This paper is an exploratory comparative case study of three Vermont food businesses. It examines the use of transaction cost and knowledge management theories to understand how food businesses with sustainability missions make key management decisions about resource allocation (the “make or buy” decision). Results suggest that these businesses’ decisions are driven in part by their personal values and interests and their desire to support other local businesses and contribute to their communities. Their decisions also largely conform to what the aforementioned theories would predict: specifically, they *make* inputs and services that are within their core competencies, they *form partnerships* to procure key inputs and support other

local businesses, and they *buy inputs* readily available in existing markets in order to free up their time and increase efficiency. Furthermore, they allocate their own time to activities they enjoy or those with high strategic value for the business. The discussion focuses on how these findings may guide future research and how these theoretical frameworks may be used to better understand entrepreneur behavior, foster mutually beneficial partnerships, and advance sustainability missions in food business.

Keywords

Transaction Costs, Knowledge Management, Make or Buy Decision, Sustainable Food System, Food Business

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Introduction

The food system plays a large and vital role in the well-being of individuals and communities in the United States as a whole, as well as in individual states such as Vermont (Conner, Sims, Berkfield, & Harrington, 2017; Conner et al., 2013; Vermont Sustainable Jobs Fund, 2013). In addition, the food and agriculture sector is a significant part of the Vermont economy (Conner et al., 2013); indeed, Vermont has a statewide strategic plan that places food and agriculture at the forefront of economic development efforts (Vermont Sustainable Jobs Fund, 2013). As such, the food system plays a significant role in community development and quality of life, with profound impacts on social and economic well-being, land use, and public health (Conner & Levine, 2006; Conner et al., 2017). For-profit businesses are critical actors in the Vermont food system, notably those firms with social responsibility and sustainability missions, as they help achieve planned community development outcomes (Conner, DeWitt, Inwood, & Archer, 2015).

Heretofore, the vast majority of economic research has utilized neoclassical economic theory and its underlying assumptions that the sole objective of a firm is profit maximization (Alexander, 2007). Critics assert that the imposition of this paradigm provides limited insights into understanding the behavior of firms, particularly where social responsibility and sustainability missions are salient (Alexander, 2007; Hobbs, 1996). Two alternative theories that have provided insights into sustainability are transaction cost and knowledge management (Carter & Easton, 2011; Peterson, 2008). Carter and Easton (2011) note that transaction cost theory has been vastly underutilized in analyses of sustainability efforts and suggest this theory as an important direction of future research. Knowledge management has been cited as key to sustainability and addressing complex problems in food supply chains (Peterson, 2008).

In this paper, I present exploratory research on three food businesses in Vermont in order to test the further development of methods that utilize transaction cost and knowledge management theories as ways to understand how these firms are able to balance profitability, lifestyle, and sustainability goals. Specifically, I apply theories of transaction

costs and knowledge management to better understand strategic decisions involving management and resource allocation. First, I review previous research. Then I describe the methods utilized for this research and present and discuss the results of three case studies, concluding with implications for future research and outreach.

Literature Review

Many businesses balance profitability with a social mission that promotes community well-being and sustainability, measuring performance along the triple bottom line of economic, social, and environmental measures—which has been referred to as people, planet, and profit (Carroll, 1979; Conner et al., 2015; Inyang, 2013; Jenkins, 2006; Kakava, Mbizi, & Manyeruke, 2013). Previous research in Vermont has found that food-based businesses are committed to a broad array of socially responsible goals and actions, including concern for the environment and use of ecologically friendly practices; contributing to local economic development, including supporting local businesses; providing support for the welfare of supply chain partners; and balancing financial interests (both self and investors) with personal quality of life and external social goals (Conner et al., 2015). These indicators of social responsibility and sustainability mirror those of previous studies (Carroll, 1979; Fitzgerald, Haynes, Schrank, & Danes, 2010; Inyang, 2013; Kakava et al., 2013).

Make or Buy

In order to succeed in the marketplace and meet sustainability goals, entrepreneurs must use resources (including their own time) wisely. The seminal work of Coase (1937), discussing how a firm procures inputs (the “make or buy” decision), theorized that a firm will buy commoditized inputs, which are readily and routinely available in established markets, but may need to make inputs which are highly specialized and not readily available. Transaction costs (finding suppliers, negotiating prices, and monitoring quality and enforcement) increase as the input attributes become more specialized and unusual. A firm will buy an input as long as the transaction costs—the effort it takes to find an item negotiate price and monitor quality—

is manageable. Williamson (1990) further discussed how these make or buy decisions outline the efficient boundary of the firm. More recently, scholars have described three models for input procurement: spot markets, vertical integration/hierarchy, and strategic partnership (Conner, Izumi, Liquori, & Hamm, 2012; Hobbs, 1996). Spot markets are used for low transaction cost inputs which are uniform and widely available: the firm simply chooses the lowest cost option. The vertical integration/hierarchy approach is used when inputs are unique or highly specialized: the firm may need to produce it if suppliers are not easily found, and/or when the resources needed to produce it are highly specialized. Strategic partnership occupies the middle ground; the firm can procure differentiated inputs but not spend the resources to own and control its production, hence focusing efforts on activities within its efficient boundary.

Partnerships have proven to be effective in helping institutional foodservice operations to meet local food procurement and educational goals (Conner et al., 2011; Conner et al., 2012). Farmers partner with food hubs, which in a sense “buys” marketing and distribution services from the food hubs rather than “making” them themselves, thus gaining market access, year-round revenue, and assistance with branding (Conner et al., 2017).

Knowledge Management

Methods of managing and sharing knowledge also affect decisions around resource use. One useful model is the management of explicit, tacit, and co-created knowledge. This model has been applied to sustainability initiatives by Peterson (2008) and to entrepreneurial education by my colleagues and me (Conner, Becot, Kolodinsky, Resnicow, & Woodruff, 2014). In this theoretical approach, explicit knowledge can be written or spoken, tacit knowledge is gained by experience, and co-created knowledge is gained through innovation and collaboration. Peterson (2008) argues that while explicit knowledge has the lowest potential for innovation and strategic value, co-created knowledge, although uncertain, dynamic, and unpredictable, nevertheless has the highest potential value. My colleagues and I (Conner et al., 2014) argue that all three are needed in order for entrepreneurs

to discover and act upon opportunities.

The transaction cost (make or buy) and knowledge management models also highlight the use of human resource services (e.g., bookkeeping, production, management, marketing) and their effect on an entrepreneur’s time. Hypothetically, as a firm evolves and grows, the entrepreneur’s time should be allocated toward its highest strategic value. Labor tasks that require only explicit knowledge will be performed essentially the same way by any person, and in any business application should be allocated to hired labor: the entrepreneur “buys” this labor input from another person (i.e., an employee or contractor). In contrast, for tasks that require specialized knowledge, either from experience within the firm (tacit) or from collaboration and innovation with external entities (co-creation), the labor input is highly specialized and context-specific. In these cases, it would be difficult to find employees able to perform these tasks, and the entrepreneur would choose to “make” these inputs by allocating their own time to them. Hence, the entrepreneur’s time evolves from spending less time working “in” the business (performing explicit knowledge tasks with low strategic value) to spending more time working “on” the business (performing co-created knowledge with high strategic value).

In this paper, I examine the utility of the transaction cost and knowledge management frameworks in the context of three Vermont food businesses with sustainability goals. This research fills a gap in the extant literature by combining these frameworks to understand resource allocation and sustainability in food businesses by testing the applicability of these methods in a small sample. Specifically, this paper addresses these research questions: How do entrepreneurs choose and operationalize sustainability goals, particularly in balance with profit and quality of life? To what extent do key decisions around resource allocation conform to what transaction cost and knowledge management theories would predict?

Methods

I used key informant interviews with the founding entrepreneurs of three Vermont-based food businesses. Each is in my network of professional con-

tacts. Two are owned by individuals; the third is owned by a married couple.¹ They were chosen to participate as cases in this study primarily due to their strong sustainability missions and successes in forming partnerships with other local businesses. Table 1 provides information on each business.

Data Collection and Analysis

I developed a semistructured interview guide that included questions on the following topics:

- the business's origins, evolution, and mission
- core competencies, make or buy decisions, and boundaries of the firm
- partnerships, their origins and evolution, services and functions provided
- knowledge management
- how partnerships affect management, performance, scope, scale, and achievement of sustainability goals

The three businesses were contacted via email and asked to participate. The interviews took place in the entrepreneurs' homes and lasted 60–90 minutes. I used standard qualitative data analysis methods (Miles & Huberman, 1994; Patton, 2002) to highlight important themes from the interviews and answer the research questions, using HyperResearch software (version 4.0.0) (Researchware, Inc., 2015). This software allows the user to highlight text, tag it with a code, and identify all text that is tagged with a given code for easy retrieval. A total of 15 codes were identified. The interview guide and list of codes are available on request. The Results section will present crucial themes emerging from the analysis, along with representative quotations.

Table 1. Description of Sample Cases

Firm Name	Primary Product	Year of Origin	2018 Gross Sales (US\$)	Number of Employees (full-time equivalent, including owner-operators)
SS	Catering	2003	\$1.5 million	12, plus seasonal
MW	Baked goods	2015	\$120,000	1.5
VT	Tortillas	2016	\$510,000	6.5

¹To address the diversity of gender identities in the sample, the pronoun “they” is used throughout.

Results

Motivations and Values

These businesses reflect the values of the entrepreneurs in their origins, mission, and evolution. Quality of life is important to all three. SS began as a small farm and evolved into a food service provider as a market for their produce: “it was both intention and trial and error.” MW began their business as a livelihood strategy “to live here and pay the bills,” while VT wanted to have a business that would allow for more family time and less travel than the consulting work they had been doing. They decided to “open a business, like Vermonters do.”

The principles of sustainability, and of consideration of economic, social, and environmental factors, continue to guide their operations. All three actively seek out ingredients from local farms and vendors, particularly those using sustainable production methods. SS continues to support farms that share space with their original farm at a local farm incubator organization, as well as to expand to purchasing from a distributor specializing in locally grown foods. MW sources only organic and/or non-GMO ingredients, with the goal of “creating balance for a resilient ecosystem.” MW has largely replaced purchases of Fair Trade palm oil with local sunflower oil. Their overall goal in procurement is to “rebuild local infrastructure for community food systems,” in this case by supporting “lots of diverse, decentralized small-scale oil processing suppliers.” VT merges their “interests in soil science and local food” by “develop[ing] a value-added product supporting local farmers.” They are dedicated to “supporting Lake Champlain basin farmers.” MW emphasizes the desire to “help people and products push for a better tomorrow”

and “get better at self-reliance with community support.”

The Make Decision

The decisions about what to “make” rather than “buy”—the use of their businesses’ capacity and of their own time—is guided by a combination of their values, interests, and expertise, as well as by market forces. SS continues to grow certain items on the farm, particularly fresh herbs not available through distributors, produce they can quickly and efficiently process and store (e.g., tomatoes and winter squash), and items they can re-use, such as drying flowers and ornamental gourds for table centerpieces. MW enjoys making packaging from old flour containers to “give them a second life.” MW also preserves produce items (e.g., making glazes from berries and apples), buying them when they are abundant, fresh, and relatively inexpensive and using their culinary skills and resources to create products that “change flavors every two weeks with changes in ecology and the season.” The use of local products and changing flavors for MW’s products creates “value through scarcity and shorts” because they intentionally limit the quantity of each item in order to make it more rare and valuable. VT focuses solely on two products within their core competency: tortillas and masa (the raw material of tortillas).

The entrepreneurs’ use of their time is similarly driven by their preferences and abilities. As SS “enjoys financial analysis” and “being the Chief Financial Officer,” SS’s role is to oversee the business, focusing on “big picture” issues of management and strategy. SS spends little time on food preparation or sales. Rather, SS focuses on the question, “What do I have to do to get the phone to ring?” SS focuses on tasks of high strategic value, involving tacit knowledge of business management and co-creating knowledge with partners (such as improving relationships with suppliers and venues), rather than explicit knowledge tasks of food preparation. SS is the oldest business, and they have the clearest evidence of allocating time to the highest strategic value. MW is motivated by one principle: “I want to be in the kitchen.” MW’s extensive use of local inputs which vary in their composition and therefore in the final product’s texture—“Saturday

fluffy, Sunday dense” —also requires them to do the baking themselves. “The problem with small local farms is consistency,” they explain. “It would not be feasible to hire an employee to bake because the recipe changes every time.” Rather, MW utilizes tacit knowledge to mill the grains and bake the product, as such explicit knowledge, like a recipe, would be inadequate. VT has a clear division of labor based on skills and interests; one partner focuses on finance and marketing, while the other focuses on production.

The Buy Decision

Two themes emerged from study of the items or services that the businesses “buy.” First, they are fairly routine (one size fits all) inputs; second, they save the business “making” time. SS buys many food items from a distributor who is “reliable, ensures food safety” and “sells cuts of meat,” saving SS the time required to source from multiple farms and break down whole animals. MW buys “base neutral” transitional flour from Quebec to balance out and make up for shortages of flour from smaller, more local sources. MW hires employees to perform explicit knowledge tasks, such as delivering product and helping with routine food-processing chores. VT utilizes distributors who have reach into distant regions. They also hire consultants in order to interface with a large distributor, perform food demonstrations in an out-of-state city, and run their social media campaigns.

Partnership

The businesses have partnerships that have advanced their goals. In addition to their supplying farms and distributors, SS’s most important partners are the venues for which they cater. SS states that “every venue is a client” and “venue relationships are everything.” Perhaps the most important venue is a local children’s museum. SS began by running its cafeteria, as a loss leader strategy in order to drive catering. After several iterations, including stepping away from the relationship for a few months, SS now only caters events at the museum, and is no longer responsible for vending at the cafeteria. SS posits two important questions to consider: “How can we be a

better partner?” and “How can we drive business to each other?” Keys to a successful partnership are “to make each other look good” and “to know the rules and expectations of each venue” (e.g., key and door policies, septic and electrical resources) so that the venue manager “does not have to manage the caterer.” In many cases, including the museum, the venue is a nonprofit organization and events and catering provide a substantial source of unrestricted funds.

MW’s major partners are the coffee shops and convenience stores that sell their pastries. MW began selling at a high-end coffee shop chain that invited them to do a “pop-up” pastry sale in one of their locations. Building on this success, the shop helped MW develop a business plan and expand operations. One key to their success is their ability to “promote each other.” Although MW has since expanded to 12 locations, the original partner “gets all the new flavors” and serves as the test audience. Knowing the customers of the various partners is critical. Those who “sell lattes get the exotic flavors” but MW “sticks to maple for those who sell [US]\$1 gas station coffee.”

VT’s most important partner is the farm from which they buy organic dent corn, the raw ingredient for the masa that is the principal ingredient for their tortillas. This partner has made investments in storage and cleaning equipment in order to deliver a clean product, saving VT the time and effort of picking up and cleaning the grain. In return, VT pays an above-market price for the product.

One overarching theme in the partnerships are the values of patience, trust, and ongoing communication. SS was able to reconnect with the museum based on trust earned from previous partnerships. “Don’t burn bridges” is a central theme in their partnership strategy. VT advises businesses to “listen more than speak” and to understand that “often ‘no’ only means ‘not now.’” VT also advises communicating with other businesses in order to improve own’s own, including sharing profit and loss statements with similarly sized businesses and asking for advice on managing growth from slightly larger businesses. In addition, VT cautions against demeaning the products of others in an effort to promote one’s own.

Markets

The theme of market channels emerged from the data themselves, rather than having been preformed based on the questions asked. An important theme in the choice of market channels is movement from direct sales (“vending”) to wholesale. Each business found that “making” their own marketing services through selling direct to consumers (vending) was both time-consuming and risky. By selling wholesale—thus “buying” marketing services from others—each business is able to have more predictable sales and spend less time selling. Each now has limited direct sales, in two cases using it mainly for marketing and testing new products.

SS began by renting “the old chicken wings place” on a busy road and selling “high-end take-home meals” to commuters. Over the next few years they added catering, mostly delivering catered business lunches. “Retail growth was slow, catering growth was rapid.” SS also moved from vending to solely catering at the museum. Now all sales are prepaid except for cash-bar sales at events. This transition away from vending lends SS “cost control, less staff and less stress.” SS adds, “Vending is fickle; it involves planning and guesswork around the weather. In the end, dropping vending lowered employee turnover, food costs, labor costs, and increased our focus.”

MW has expanded to 12 wholesale accounts, although they still do some vending at a small neighborhood farmers market. “Wholesale accounts have standing orders. They get standard products, doughnuts and cakes. It pays the rent.” On the other hand, the farmers market is a “test for what my community needs” and allows for experimentation on a smaller scale.

VT began selling at farmers markets and doing “pop-up dinners” at the same local farmers market where MW sells, but found that these markets involved “lots of time and ingredients, but no profit. We did not want to invest in brick and mortar,” so they transitioned to wholesale sales. Currently, they only provide samples at trade shows and that only as a way to “build morale and brand.”

Discussion and Conclusions

This paper utilizes transaction cost and knowledge

management theories to analyze decisions around resource allocation for three Vermont food businesses. These theories are promising alternatives to the more prominent neoclassical theory and assumptions of profit maximization, particularly for understanding firms with sustainability missions (Alexander, 2007; Carter & Easton, 2011; Hobbs, 1996; Peterson, 2008). The contribution of this study to the literature is the use of these frameworks in analysis of for-profit firms with sustainability goals as proof that the concepts can be fruitful for future study. As previous research results have indicated, these kinds of entrepreneurs have strong sustainability missions, notably around supporting other local businesses and being stewards of the environment while maintaining their personal quality of life (Carroll, 1979; Conner et al., 2015; Fitzgerald, Haynes, Schrank, & Danes, 2010; Inyang, 2013; Kakava et al., 2013). Each has been able to incorporate their values and passions into their business operations. Notably, the goal of profit maximization, predicted by neoclassical theory, was not mentioned by any respondent.

Their make or buy decisions and the efficient boundaries of the firms tend to align well with transaction cost theory (Coase, 1937; Conner et al., 2012; Hobbs, 1996; Williamson, 1990). In terms of vertical integration/hierarchy, each makes products with varying proportions of local ingredients, using their expertise to transform and add value. For example, SS uses its capacity to process and store produce efficiently and to grow herbs not commonly available. Similarly, MW preserves produce to make unique glazes that are not generally available to buy. In contrast, in terms of the concept of spot markets, they buy items which are available elsewhere: SS extensively uses a distributor with a wide array of local products and MW buys flour. Each business has key partners who drive business to each other, as with SS and MW, or who are invested in equipment in order to supply a unique input (e.g., stored, cleaned, and delivered dent corn). The use of entrepreneurs' time aligns with tasks they enjoy (e.g., MW personally enjoys baking), as well as tasks, such as SS's management and partnership formation, that require tacit or co-created knowledge and therefore have higher strategic value. This paper also applies the make or buy de-

cision model to interpret entrepreneurs' time allocation and market channel decisions, which is a novel contribution to the literature.


The strength of this paper is the novel use of these theories, as applied to three very different cases, as evidence that they have utility for future inquiry. Notably, it proposes theoretical frameworks beyond the dominant neoclassical paradigm that will better explain firm behavior. The chief weakness of this study is the small, unrepresentative, and narrow sample and lack of generalizability to other samples.

Implications

This paper explores the operationalization of sustainability goals for research purposes and the usefulness of these two theories as applied to food businesses. It is highly exploratory research, intended as a pilot study for future research to further understand and guide the management of sustainable food businesses. Future research can take a number of directions. First, more research on these three businesses (e.g., analysis of financial documents, and customer and buyer interviews) could provide greater depth of understanding of these firms' decisions and their impacts. Second, key informant interviews of food businesses with no sustainability missions and non-food businesses with sustainability missions would provide further comparisons. Third, surveys can provide data from a large number of firms (e.g., food and non-food, with and without sustainability missions) to tabulate and correlate prevalences of attributes, goals, and behaviors. A greater understanding of when decisions align with sustainability principles and, more importantly, when and why they do not, would add nuances to understanding entrepreneur behavior and guide better education and outreach efforts. Important future topics would include the trade-offs and changes in firm boundary when sustainability goals are pursued.

Make or buy decisions can be incorporated into agri-business and food entrepreneurship courses, as well as farm viability programming. Decision cases can be developed to further refine our understanding of the make or buy model and its utility. In addition, education and outreach can highlight the potential benefits of forming partner-

ships and their role in enhancing profitability and entrepreneurs' quality of life, and advancing sustainability missions. It is my hope that the information in this paper will inform future research

and ultimately improve decision making and facilitate more effective adoption of sustainability principles by businesses of all types. 

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Food waste knowledge, attitudes, and behavioral intentions among university students

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Abstract

After policy change, educational programming has been cited as one of the most powerful tools for improving food systems and decreasing food waste. University students represent a population in which emerging habits, skills, and identity may

be targeted easily and changed through on-campus educational programming. To understand how to best implement programming on impacts of food, food waste, and related issues, the factors that underlie students' behaviors related to food waste must be understood. We analyzed factors that influence food waste-related behaviors within a university student population to understand the potential for improving targeted, school-based food waste diversion programming. Four hundred and ninety-five students were surveyed to: (1) identify self-reported knowledge, attitudes, and behaviors

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related to food waste; (2) explore underlying factors driving food waste-related behaviors through exploratory factor analysis (EFA); and (3) understand the interactions between factors within a regression framework. Participants reported that they most often left food on their plate because it did not taste good or they had overestimated portion size. A majority of participants already performed many food waste reduction behaviors, and were both interested in taking action and aware that their efforts could make a difference. Food management skills, compost attitudes, sustainability attitudes, and reported household food waste were correlated, in various ways, with both intent to reduce and reported food waste reduction behaviors. Opportunities for improving university-related food waste programming through this data are explored.

Keywords

Food Waste, Sustainability, Behavior Change, Environmental Education, Behavioral Factors, Exploratory Factor Analysis

Introduction

Human need (biophysical) and want (preferences and habits) for food are arguably the primary way in which we shape our world. Food is also central to culture and community. The global food cycle—defined as the system encompassing all activities, interconnections, drivers, and outcomes related to the production, distribution, consumption, and waste of food worldwide (Neff, 2015)—drives environmental, social, and political change across time, culture, and geographic region. Agriculture and other land uses related to food production have one and a half times the greenhouse gas (GHG) footprint of the global transportation sector (Bajželj, Allwood, & Cullen, 2013; Olhoff, 2018). Additionally, agriculture is a leading cause of biodiversity loss and pollution (Feldstein, 2017) and contributes significantly to racial, gender, labor, and other social inequities (Patel, 2012; Peniman, 2018).

Not only does the food cycle have significant global impact, but it also remains highly inefficient. Up to 40% of the total edible food in the U.S. and 30% worldwide is wasted (Food and Agriculture

Organization of the United Nations [FAO], 2013). Loss of edible food occurs at each stage within the food cycle from production to consumption, but eaters (consumers of food) are responsible for the bulk (60%) of food waste along the food cycle in countries with more affluent economies (Lipinski et al., 2013). Factors that influence food waste-related behaviors are diverse and context-specific (Thomas & Sharp, 2013). Therefore, mobilizing change will rely on policy intervention, skill building, community mobilization, and grassroots education, among other things (Graham-Rowe, Jessop, & Sparks, 2014; ReFED, 2016).

As participation in higher education increases, marriage and childbearing are delayed, and technology transforms the way we interact, college age is emerging as a separate and essential period of life in which significant changes occur and defining lifestyle skills and habits emerge. Research indicates that college-aged adults tend to have an increased risk of becoming obese, decreased physical activity, increased leisure-time computer use, and decreased overall quality of diet and vegetable consumption (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). Additionally, marketers of sugary beverages and snacks heavily target adolescent and college-aged (and even younger) populations as important customers and to develop brand loyalty (Nestle, Bittman, & Baer, 2015). Young adulthood is also an important time for developing identity, self-efficacy, and life skills (Nelson et al., 2008). Therefore, this period is an essential and optimal time for behavioral interventions related to food intake and health. Furthermore, the university setting provides a microcosm that is excellent for developing and implementing specified and targeted behavioral interventions. Research shows that students targeted by food- and health-related programming on-campus, particularly with the support of mentors, demonstrate an increased intent to change health-related behavior after programming (McComb, Jones, Smith, Collins, & Pope, 2016). Therefore, more research on food-related interventions targeted to early adults and on college campuses may have the potential to affect both individual behavior and develop a more skilled community in relation to health and sustainable food.

Furthermore, community education, generally,

has been found to be a primary tool for addressing food waste. Rethink Food Waste through Economics and Data (ReFED) gathered available data and expert input, and performed an assessment of cost effectiveness and potential impacts of 27 solutions that could be used to address food waste in the U.S. (ReFED, 2016). Community education was ranked as the second most economically feasible solution to food waste (second only to standardizing food labeling) (ReFED, 2016). Educational programming was also reported as the solution with the second largest potential for GHG reductions, after centralized composting (ReFED, 2016). While the ReFED report was meant to inform policy, it did not assess policy change as a specific potential solution. Policy change, however, remains one of the most effective methods for addressing food waste, as is demonstrated in examples such as grocer donation requirement laws in Europe, implementation of fee-by-food weight systems in Asia, and implementation of composting infrastructure in many cities worldwide (Chrisafis, 2016; Chrobog, 2015; Evans, 2011). Additionally, educational programs in the U.K. and elsewhere have shown considerable success in addressing food waste behaviors, as well (Quested, Ingle, & Parry, 2013). For example, the *Love Food Hate Waste* campaign funded through the Waste and Resources Action Programme (WRAP) in the U.K. is unique in that both significant funding and research efforts are combined to engage eaters in food-waste diversion skills. A 1.1 million ton (13%) reduction in annual household food waste in the U.K. between 2007 and 2010 is partially attributed to this programming (Quested, Marsh, Stunell, & Parry, 2013).

So, why do eaters waste food? Food waste behaviors are influenced by many, often competing, factors (Benítez, Lozano-Olvera, Morelos, & Vega, 2008; Evans, 2012; Graham-Rowe et al., 2014). Cost and convenience, including accessible infrastructure like city composting, are strong determinants of food waste diversion behaviors (Pelletier, Dion, Tuson, & Green-Demers, 1999; Refsgaard & Magnussen, 2009). The role of cost and convenience, in general, to behavior determination is well established in many behavioral and motivational theories, including expectancy-value theory and the

energization theory of motivation (Eccles & Wigfield, 2002; Fiske, Gilbert, & Lindzey, 2010). Even minor environmental cues and conveniences such as smaller plate size, absence of cafeteria trays, displaying healthier options before less healthful ones, and precutting fruits instead of serving them whole, can encourage food waste diversion and healthier eating habits (Freedman & Brochado, 2010; Lehner, Mont, & Heiskanen, 2015; Moseley & Stoker, 2013).

Knowledge and skills specific to food management are also essential to food waste diversion (Graham-Rowe et al., 2014; Whitehair, Shanklin, & Brannon, 2013). Food management skills have been the focus of various food waste diversion campaigns and interventions (Oliver, 2010; Pollan, 2008; Quested et al., 2013). Presumably, having specific food-related knowledge and food management skills decreases the actual and perceived costs of food preparation and waste management. In fact, consumer perception of their ability to affect systems is also important in determining action (Eccles & Wigfield, 2002).

Both general sustainability beliefs and beliefs specific to food waste have been shown to influence plate waste (Whitehair et al., 2013). Emotions such as guilt are also important to food waste diversion (Graham-Rowe et al., 2014; Leigh Gibson, 2006). Nevertheless, even after acknowledging many factors important for food waste-related behavior change, ingrained consumption habits are difficult to change (Graham-Rowe et al., 2014).

Food use labeling is also a major driver of food waste, causing up to 20% of household waste (Leib, Ferro, et al., 2013; Neff, Spiker, & Truant, 2015; WRAP UK, 2017). The vagueness of food use labels and the lack of regulated standards lead to a considerable amount of consumer confusion about how date labels translate to food safety, thus resulting in significant food waste globally (Leib, Ferro, et al., 2013; WRAP UK, 2017).

Understanding the impacts of these factors on food-waste behaviors and determining how to influence them through targeted interventions are necessary to promote food waste diversion efforts. In this study, we analyzed factors that influence food waste-related behaviors within university stu-

dent populations to understand the potential for improving targeted, school-based food-waste diversion programming. Food waste diversion is defined here as all manners of diverting *edible* food from the landfill, including more efficient procurement and management of food.

We developed a simplified diagram (Figure 1) of the main factors on which we built our survey instrument. Although these are the factors on which our analysis relied, as discussed previously, food waste-related behaviors are complex. We also acknowledge that positive self-reports related to behavioral and affective factors do not directly lead to action. Therefore, we included both “action” and “intention to act” as separate outcomes in our analysis. They are represented in our simplified diagram as two factors loosely, but not directly, associated with one another (Figure 1).

We analyzed 495 surveys on food waste administered to university students using a three-step approach. First, we assessed average reported food waste attitudes, knowledge, intent, and behaviors compared to those reported nationally (Objective 1). Second, we determined the underlying factors that influence reported food waste diversion behaviors through an exploratory factor analysis (EFA) (Objective 2). Third, we considered relationships between emergent factors within a regression framework (Objective 3).

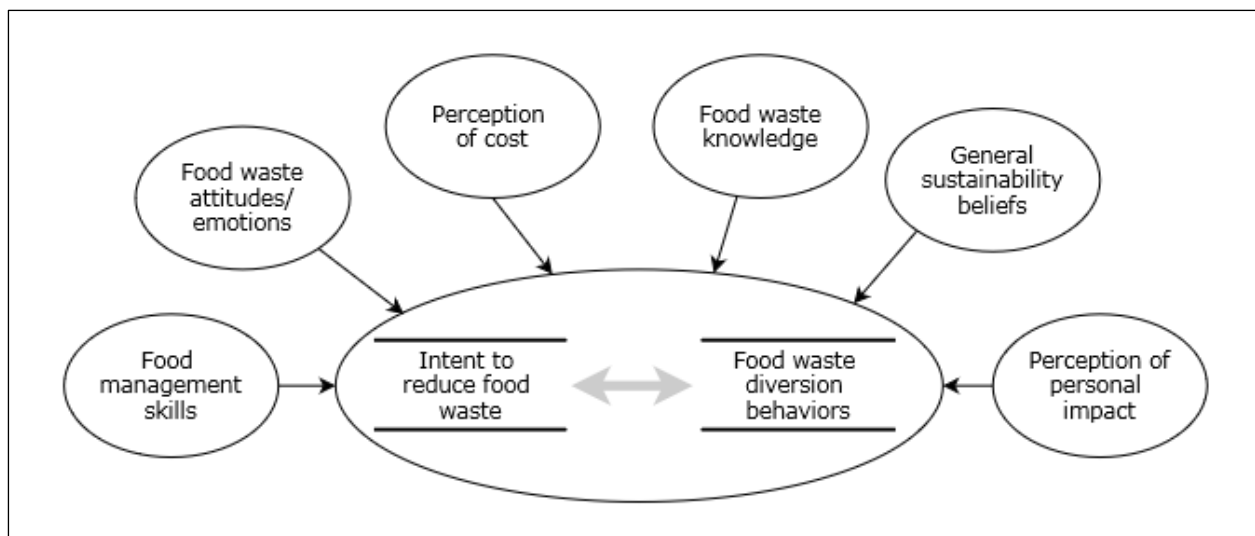
Method

Setting and Participants

Our study took place during the 2015 academic year at Portland State University (PSU), located in downtown Portland, Oregon, U.S. With an enrollment of 28,000 students, PSU is the largest university in Oregon. Demographically, 56.6% identify as White, 8.4% as Asian, 12.5% as Latino, 7.0% as international, 3.3% as African American, 1.1% as Native American, 6.0% as multi-ethnic, 0.06% as Native Hawaiian/Pacific Islander, and 4.6% as other (PSU University Communications, 2016). Full-time students represent 61%, and part-time represent 39%. A majority of students commute (approximately 80%), while 10% reside in university housing on campus (Housing and Residence Life, 2019; University Communications, 2017).

Two cafeterias serve students, along with various options throughout the urban area. Most of our surveying was conducted in the residence-hall cafeteria as part of a campuswide effort spearheaded by the Campus Sustainability Office (CSO) to begin to understand food waste behaviors. A full-scale composting program in residence halls was rolled out in 2013 (Siegrist, 2015), a couple years before our survey. Therefore, all residents have access to composting options in their dormitories. Furthermore, there are some compost re-

Figure 1. A Simplified Conceptual Figure of Various Underlying Factors that Influence Food Waste Diversion Behaviors



ceptacles throughout campus, although not in all mid-point receptacles (the divided containers that have subsections for landfill-bound trash, recyclable glass, and sometimes other materials). The residence hall cafeteria programming emphasizes local, sustainable food options year-round; for example, it composts all food scraps, highlights local sourcing, and encourages students to participate in Meatless Mondays. The cafeteria hosts an average of 175 people at breakfast, 400 people at lunch, and 500 to 600 people at dinner each day (C. Wapelhorst, personal communication, 2015).

Although the residence hall cafeteria avoids food waste specifically by composting all food waste that comes in through the tray returns (the only waste receptacle in the cafeteria), on the campus overall an average of 25% of landfill-bound waste is food scraps (and food scraps make up 36% of the landfill-bound compostable material in general) (Doherty, Brannon, & Crum, 2013). This includes more than 500 tons per year of valuable food scraps that could be diverted (Hair, 2013). As an institution, the university is working toward a 25% reduction in waste generation and 10% reduction in its landfill-bound waste by 2030 as part of its Climate Action Plan (CSO, 2010).

A total of 495 surveys were collected through convenience sampling in the school cafeteria, three freshman classes, and online throughout campus. At the cafeteria, students were approached while in line to pay for food or while eating, and returned their completed questionnaires after their meal. Students in some freshman courses were given questionnaires during a Campus Sustainability Office class presentation. The online survey was set up in Qualtrics (Qualtrics, Provo, Utah) and distributed by email to students in various departments throughout the university.

Data Collection

The survey instrument was designed to measure food-waste related attitudes, knowledge, intent, reported behaviors, and general sustainability beliefs (Graham-Rowe et al., 2014; Lipinski et al., 2013; Neff et al., 2015; Refsgaard & Magnussen, 2009). Questions (Table 1) were modeled from previous literature on food waste, but developed further based on knowledge of the specific population, as

described below. Cognitive interviews were conducted and survey experts were consulted to establish the content validity of the instrument.

Respondents were asked 24 questions with Likert scales and three questions with written answers (Table 1). All Likert-type questions were given a five-point response scale that ranged from “Strongly agree” to “Strongly disagree,” with “Neutral” as the middle anchor point. A 5-point scale allows for sufficient variation within the scale without risking participant reluctance to choose extreme answers on a wider scale (Boslaugh, 2013). Questions written in anti-food waste diversion form (for example, “I do not like composting”) were reverse coded for analysis. Basic university-related demographic questions were also included.

Food waste knowledge and knowledge of on-campus resources were measured through questions that have been used in other food-waste studies (Leib, Ferro, et al., 2013; Quedsted et al., 2013) and questions on specific PSU campus-related food waste diversion knowledge (Pelletier et al., 1999; Whitehair et al., 2013). For example, questions included “I understand food freshness labels” and “I know about the campus composting program.” Respondents’ knowledge was also probed by asking them to estimate the percent of food waste at various consumer levels: an average American household, the campus community, and the U.S. as a whole. Additionally, respondents were asked to pinpoint waste in the food cycle from production to consumption. Food waste estimate responses were compared to percent averages for “North American and Oceania” reported by Lipinski et al. (2013) to determine how accurately students perceived consumer waste generation compared to preconsumer waste generation. Household and national estimates were compared to those reported in Gunders (2012) and Parfitt, Barthel, and Macnaughton (2010) to determine if students generally over- or underestimated their personal food waste compared to other average Americans. Previous research has indicated that Americans underestimate their own household food waste by up to 47% (McDermott, Elliott, Moreno, Broderson, & Mulder, 2019).

Intent and interest in food waste reduction were measured with questions such as “I put effort

into reducing food waste” and “I am interested in taking action to prevent food waste” (Eilam & Trop, 2012; Hebrok & Boks, 2017; Neff et al., 2015). Food management skills have been cited as important in food waste generation (Graham-Rowe et al., 2014; Neff et al., 2015; Vidgen & Gallegos, 2014) and were measured using a series of questions: “I eat leftovers,” “I check the refrigerator before shopping,” and “I compost my food scraps.” Students were also asked to estimate their own household waste and the percentage of food that is wasted from that which they purchase overall.

Attitudes towards food waste were measured with both cognitive and affective statements. Cognitive statements included items such as “Food waste does not bother me” and “My individual actions towards food waste do not make a difference” that are similar to questions posed in other studies (Brook Lyndhurst, 2007; McKenzie-Mohr et al., 1995; Neff et al., 2015). The affective component was measured with the additional items: “I dislike composting,” “When I compost I feel like I’m contributing to the greater good,” and “Composting stinks and is gross.” “I don’t think the food I throw away costs much money” measured the perceived cost of food waste. These items were generated by the authors.

Broader sustainability beliefs were probed indirectly with the following questions: “I believe that many materials can be reused or recycled into something new,” “I believe proper waste disposal makes a positive environmental impact,” “I would like to see more programs that help reduce food waste,” and “I would enroll in a course with a sustainability theme.” Participants were also directly asked about the amount of food they wasted, as a percentage of total food, and the reasons for that food waste with the question, “I generally leave food on my plate because?” with multiple potential answers. Basic, university-related demographic questions were also asked, including age, gender, academic level, and whether students lived on-campus.

General Frequency Analysis (Not Applicable to EFA)

General frequency analysis of the data allowed for initial insight into behavioral and dispositional re-

sponses and a comparison to previously published data, where appropriate (Objective 1). Specifically, for summary statistics (but not for the EFA), when participants “agreed” with a statement, the results presented are a sum of “agree” and “strongly agree” responses. Similarly, if participants “disagreed,” the “disagree” and “strongly disagree” responses were combined.

Factor Analysis

We conducted an exploratory factor analysis (EFA) to explore the underlying factor structure of the 24 Likert items (Objective 2) and generate response variables for the regression analysis. As opposed to a hypothesis-driven endeavor, an exploratory method explores which factors were present but maintains methodological flexibility to better understand and utilize potential unexpected correlations among items (Bartholomew, Steele, Galbraith, & Moustaki, 2008).

Following the data screening, the EFA was conducted using a multistep process and clear set of decision rules (Williams, Onsmann, & Brown, 2010). First, a principal axis extraction method was used because it is robust against non-normally distributed variables (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The analysis was performed on a polychoric correlation matrix, which is a modified version of Pearson’s correlation that is more appropriate for ordinal data, using oblique rotation to allow for some correlation between factors (Browne, 2001; Lorenzo-Seva & Ferrando, 2015). Second, we examined the item-loadings and cross-loadings and retained only those with eigenvalues greater than one (Costello & Osborne, 2005). Finally, we retained factors if: (a) they contained at least three items with loadings greater than 0.32, and (b) no cross-loadings of 0.32 or above (Yong & Pearce, 2013). Multi-item indexes were generated for each factor by averaging the responses to questions within each factor. All indexes were evaluated for internal correlation using Cronbach’s alpha (Boslaugh, 2013). Pairwise deletion, which leaves all available cases without removing all data from a given respondent (Schafer & Graham, 2002), was used for all steps in the analysis. This deletion method allows for the analysis of all available data,

avoiding the additional data loss that occurs when list-wise deletion is utilized.

Regression Analysis

The relationship of the measured factors and reported individual food waste to both “intent” and “food waste diversion behaviors” (Figure 1) were explored using linear regression (Objective 3). The factor indexes for these two concepts were used as the dependent variable in separate models. This was done to get a more complete understanding of the impact of factors on one another within the model (Figure 1). Models were reduced to include significant factor indexes.

Although there are obvious limitations to using indexes based on self-reported behavior, it is appropriate due to the dispositional and behavioral data being collected and is common to this type of research (Barr, 2007). Predictor variables were tested for multicollinearity within the regression model using a variance inflation factor (VIF); no multicollinearity was detected below three. Data analysis was done in SPS for Windows, version 24.0 (IBM, Armonk, NY) and R version 3.2.4 (R Core Team, Vienna, Austria).

Results and Discussion

Sample Characteristics and Demographics

A total of 495 surveys were collected, 332 from the residence hall cafeteria, 99 in freshman inquiry (required freshmen core) classes during class visits from the Campus Sustainability Office, and 64 online. The average age of respondents was 21, with a range of 18 to 58 years. Of participants, 54% were female and 42% male. A majority ($n=490$, 94% of respondents) were undergraduate students, and three (<1%) were postbachelor students. A majority ($n=377$, 76%) lived in residence halls on campus. On average, participants ate at the residence hall cafeteria eight times a week and at the general school cafeteria once a week. On average, the house or dorm room of participants had two members.

General Frequency Analysis

Participants reported wasting an average of 18% of the food they bought, but perceived that average

Americans were more wasteful (35% on average) (Figure 2). They estimated that 50% of food produced nationally was wasted (Figure 2). Thirty percent ($n=150$) of students reported that national food waste was in the 30-40% range.

This range is significant, because other studies show that an average of 30–40% of food produced in the U.S. is wasted (Figure 2; Buzby, Wells, & Aulakh, 2014; Gunders, 2012). In regard to household waste, research shows that Americans do indeed waste between 15% and 30% of the food they buy (Parfitt et al., 2010; Thyberg & Tonjes, 2015). Additionally, most Americans underestimate their own contribution to food waste compared to others (Quested et al., 2013). Although participants in our study reported an average household waste within this range, they also perceived themselves as less wasteful than others.

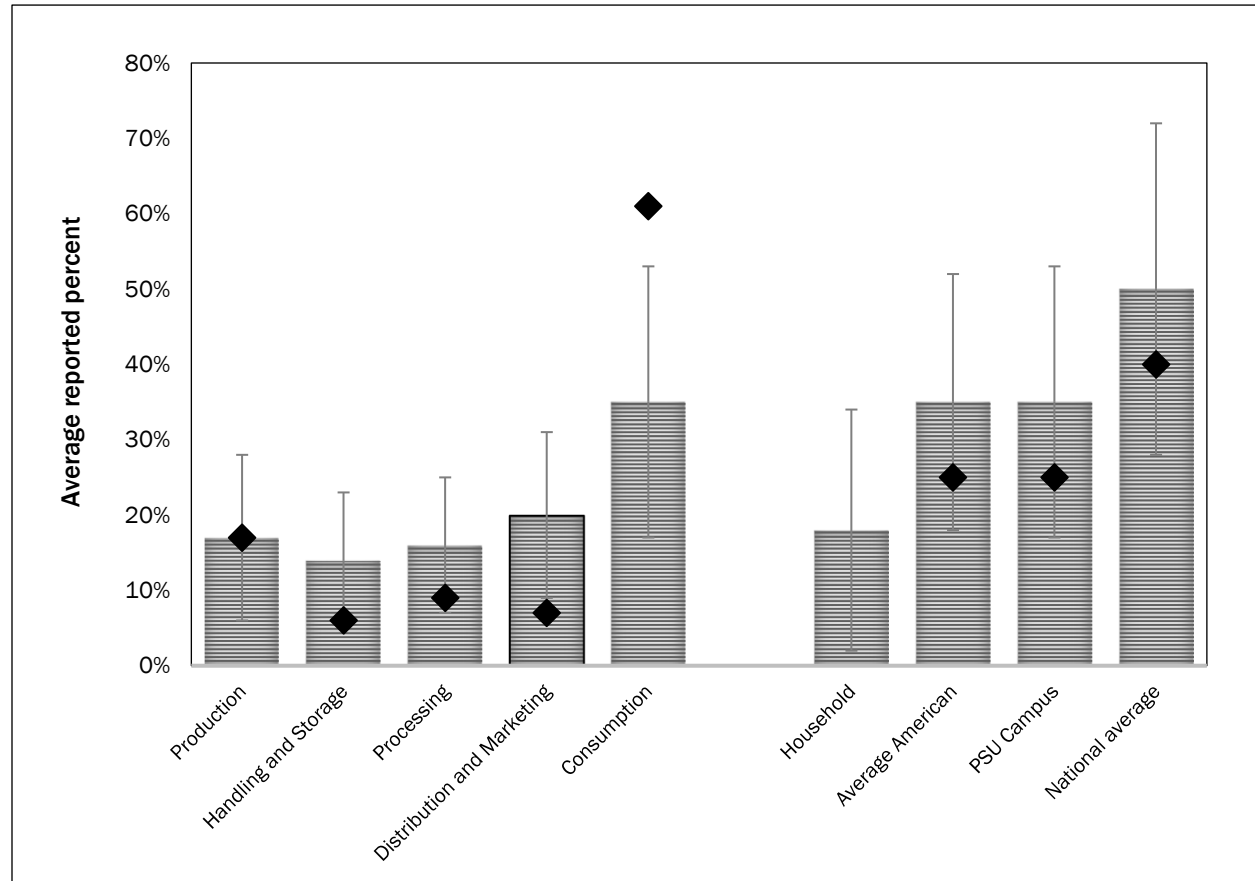
In addition to estimating their personal household waste, students estimated the amount of food waste along the food cycle that consumers were directly responsible for, that is, waste occurring after purchase of food. Students reported an average of 35% food waste by consumers along the food cycle, and 65% percent waste occurring upstream of the consumer (Figure 2).

The participants’ perception of consumer waste is a significant underestimate; research shows that about 60% of food waste, in countries with higher income, occurs in the consumption phase (Figure 2; Lipinski et al., 2013). The participants’ underestimate is consistent with previous research in which participants tend to downplay the contribution of consumers to food waste and exaggerate the percentage of waste that occurs upstream of the consumer (Neff et al., 2015; Thomas & Sharp, 2013). On the other hand, students perceived the U.S. as more wasteful of food than it is, estimating 50% food waste, whereas research indicates a true value between 30% and 40% (Gunders, 2012).

When asked for the single most common reason they left food on their plate, 55% of participants said because it “doesn’t taste good,” 31% because they “overestimated the portion size,” 9% because they “don’t have time to eat it,” 6% because they are “being aware of their caloric intake,” and 3% did not know or declined to answer. Four percent of respondents chose “Other” and dictated

Figure 2. Average Perception of How Much Food Is Wasted Along the Food Cycle in the U.S. and at Various Consumer Levels

Black diamonds (◆) represent the estimated “true” values of food waste for each level as reported in the literature (Doherty et al., 2013; Gunders, 2012a; Lipinski et al., 2013; Parfitt et al., 2010). Percent average household can be compared to the food waste of an average American, to its right, but no true value is given as the true value differs for each individual. Standard deviation of responses are represented with error bars.



their top reason for wasting food; these included (each less than 1% of total respondents) that they were sick or felt sick, did not or usually did not leave food waste, were not hungry, realized that dietary restrictions were not met, various responses related to portion size, and various responses related to the quality of the food. One respondent noted an eating disorder and another said “I don’t care.”

In comparison, European food studies of meals eaten outside the home cited portion size or ordering too much as the main reason for plate waste. Being full, dislike of the taste, smell, or preparation of the food, and social influence were also cited as reasons for plate waste (Betz, Buchli,

Göbel, & Müller, 2015). Plate waste was also perceived by the respondents in these studies as not the customer’s responsibility or out of their control (Oliveira, Pinto de Moura, & Cunha, 2016).

In regards to food waste diversion thoughts and behaviors in our study, 71% of participants agreed that they thought about the food waste they generated; 70% put effort into reducing food waste; 65% were interested in taking action; and only 23% talked to others about food waste. Thirty-six percent composted their own food scraps. Eighty-two percent ate leftovers; 77% checked the refrigerator before shopping; and 62% made shopping lists. It should be noted that only 38% prepared or cooked some of their own meals.

With respect to attitudes, only 5% reported that “food waste doesn’t bother them”; 4% “dislike compost and composting”; 7% of participants agreed that if the compost, they “don’t need to worry about source reduction (buying/preparing less food to avoid waste)”; and 4% agreed that food waste does not bother them because it breaks down in the landfill. Forty-four percent of participants felt like composting “contributed to the greater good.” Only 10% agreed that “composting stinks and is gross” and only 11% agreed that their “actions towards food waste do not make much of a difference.”

This data was relatively consistent with previously published research, in which only 9% of participants said that food waste did not bother them at all, approximately 75% of respondents used leftovers in future meals (sometimes or often), approximately 90% checked their refrigerator and cupboards before shopping (sometimes or always), and approximately 85% made shopping lists (sometimes or always) (Neff et al., 2015).

In terms of general sustainability beliefs, 84% agreed that “materials can be reused or recycled into something new,” 89% agreed that “proper waste disposal makes a positive environmental impact,” and 64% agreed that they “would like to see more programs on campus that help reduce food waste.” Comparable research at another university campus also indicated high levels of agreement with sustainability-related items, even before waste reduction programming (Whitehair et al., 2013).

Factor Analysis and Regression Models

The EFA resulted in five factors based on our selection criteria. The items factored into categories (Table 1) similar to those that we attempted to measure (Figure 1), including clear factors for “Intent to decrease food waste” and “Food waste diversion behaviors.” Factors represented about 55% of the variance in survey responses. The questions in each factor were averaged to produce factor indexes for the regression model. The factor indexes for intent and food waste-related behaviors were used as dependent variables to determine how the other factors and reported household food waste interacted with these constructs.

The food waste diversion behavior model

($n=495$) indicated that three variables were most significantly ($p<0.01$) related to the food waste-related behavior index factor variable (after model reduction): intent to decrease food waste ($p<0.01$), composting ($p<0.001$), and waste attitudes ($p<0.001$) (Table 2, column 1). The model was highly significant as assessed by an analysis of variance (ANOVA) ($p<0.001$, $R^2=0.242$). Interestingly, the composting index was negatively correlated with food waste diversion intent, but attitudes toward composting were still positively correlated. This may indicate that those who divert food waste have to worry less about composting. It is also consistent with research showing that those who compost report worrying less about source reduction (Brook Lyndhurst, 2007; Neff et al., 2015; Refsgaard & Magnussen, 2009). Due to the complexity of factors that influence human psychology and behavior, models explaining 20% to 30% of variance are considered beneficial and useful (Bartholomew et al., 2008).

The model for intent to decrease food waste ($n=495$) showed significant relationship to all six input variables: sustainability intent and communication ($p<0.001$), food waste diversion actions ($p<0.001$), attitudes about composting ($p<0.001$), composting ($p<0.001$), reported household food waste ($p<0.001$), and waste attitudes ($p<0.01$) (Table 2; column 2). The model was highly significant as assessed by an ANOVA ($p<0.001$, $R^2=0.368$). Interestingly, respondents’ reported personal household waste amounts were positively correlated with their intent to decrease waste; that is, the more food a student perceived they wasted, the higher their intent to decrease food waste. Fifty percent of respondents indicated that they only wasted 0% to 10% of their food.

It should be noted that asking students to report their household food waste percentages can be very challenging and represents a complex construct. A number of studies have shown that people consistently underestimate their own food waste. In fact, in multiple studies, between 45% and 70% of respondents indicate that they waste “very little,” “hardly any,” “no food,” or “0-10% of food” (Neff et al., 2015; Quedsted et al., 2013; Thyberg & Tonjes, 2015). On the other hand, research suggests that participants reporting higher food

Table 1. Summary of Likert Items and Factor Indexes

Item (nested within factor)	Item loading	Cronbach's alpha	% Agree	% Neutral	% Disagree
Food waste diversion behaviors		0.648			
I eat leftovers	0.476		82.4	10.7	5.7
I check the refrigerator before shopping	0.77		77	13.3	8.7
I don't make lists or plan meals before shopping	0.655		18.2	19.6	61.2
I think about the portions of food that I take or cook	0.44		75.6	17.2	6.1
I prepare/cook some of my meals	0.21*		69.1	17.1	12.3
Intent to decrease food waste		0.752			
I think about the food waste I generate	0.944		70.7	20.2	8.3
I put effort into reducing food waste	0.711		70.1	21.2	7.9
I am interested in taking action to prevent food waste	0.545		64.8	28.1	6.7
Composting		0.813			
I know about the residence hall compost program	0.747		36.8	20.7	39.5
When I compost, I feel like I'm contributing to the greater good	0.881		81.8	13	1.9
Composting stinks and is gross	0.881		18.6	31.6	46.5
Sustainability intent and communication		0.621			
I would be interested in attending a workshop on portioning or cooking for one person	0.709		33.5	36	29.3
I talk to other people about food waste	0.322		23.2	31.1	41.8
I would enroll in a course with a sustainability theme	0.523		44.6	30.7	21.6
Waste attitudes		0.709			
I understand food freshness labels (sell by, best by, use by, expiration date, etc.)	0.542		71.1	18	7.3
I believe that many materials can be reused or recycling into something new	0.731		84	10.7	2.2
I believe that proper waste disposal makes a positive environmental impact	0.736		88.5	6.7	1.8
Attitudes about compost		0.638			
I compost my food scraps	0.324		35.8	22	39.4
If I compost, I don't need to worry about source reduction (buying/preparing less food to avoid waste)	0.592		6.5	29.1	62
I dislike compost and composting	0.666		4.2	24.4	68.7
Food breaks down in the landfill, so it doesn't bother me	0.946		3.8	21.6	71.5

* Item was removed from its original factor without significantly affecting its Cronbach's alpha and improving both the logical and correlational strength of factor "Food waste diversion actions."

waste percentages may actually be more informed and motivated to change their behaviors. Guilt has been shown to influence attitudes and intents toward food waste (Graham-Rowe et al., 2014). Our results are consistent: most respondents reported low amounts of food waste, but those reporting

higher amounts of food waste also reported a higher intent to make change.

Implications and Limitations

Results of this research are promising. Students surveyed are thinking about food waste, interested

Table 2. Linear Regression Models Indicating Relationships Between Measured Factors and Both “Intent To Decrease Food Waste” and “Reported Food Diversion Behaviors”

Factor index/item	Food waste diversion behav- iors	Intent to decrease food waste
	model	model
y-intercept	0.889	0.288
Food waste diversion actions index	<i>Dependent</i>	0.224***
Intent to decrease food waste index	0.296***	<i>Dependent</i>
Composting index	0.324***	- 0.174***
Sustainability intent and communication index		0.312***
Waste attitudes index	0.115**	0.104**
Attitudes about compost index		0.184***
Your household waste (%)		0.159***
(n=495)	$R^2 = 0.242$	$R^2 = 0.368$

in taking action, and aware that they can make a difference. Respondents also demonstrate similar attitudes and perceived food waste-related behaviors as adults nationally (Neff et al., 2015). Food management skills, compost attitudes, sustainability attitudes, and reported household food waste are correlated with intent to reduce and with actual food-waste reduction behaviors. Therefore, these constructs are potential target areas for university food-waste diversion programming.

Although students have some knowledge around food waste and its drivers, many still underestimate their own food waste and that of consumers generally, indicating a potential knowledge gap that can be addressed by programming. Although knowledge does not always lead to action, the college period represents a time of significant change, identity progression, and habit development (Nelson et al., 2008). The fact that only 23% of students reported talking to others about food waste suggests an opportunity for opening up dialogue within university community spaces about improving local and global food systems.

Results also indicate a moderate level of composting (about 1 in 3 students) by participants. This suggests that the convenient availability of compost infrastructure (as is available in PSU residence halls) increases participation in composting programs. Implemented in 2011, Portland also has citywide composting for single-unit and some

multi-unit dwellings. More composting participation should be encouraged through continued programming and infrastructure development.

This study also provides insights into factors that play a role in food waste diversion behavior of university students. The EFA and regression modeling show that our survey instrument was well suited for predicting the food waste diversion in this population. It would be beneficial to consider more items on barriers to food waste reduction and social influence, as both are central to the university setting. A confirmatory factor analysis on a survey instrument based on these results could strengthen the survey instrument for assessing intervention success. This model could be further applied to and assessed in other settings, such as event settings, households, and communities, in which programming could be implemented. Additionally, the use of random sampling over convenience sampling could improve future studies.

The strength of survey data is in understanding perceptions rather than actual behavior. Further research should compare self-perception from surveys to actual food waste behaviors measured through waste audits and observation, such as detailed daily journaling. Although linked food waste data is challenging to collect, some successful models exist, such as tagging or barcoding students' cafeteria trays individually during waste audits to identify their food waste in relation to survey responses

(Whitehair et al., 2013). Furthermore, although the university setting provides opportunity for food-related behavior change (McComb et al., 2016; Nelson et al., 2008), common lingering questions include whether and how such change can be integrated into a student's long-term lifestyle. Since socialization, infrastructure for change, and campus culture play directly into student food-related behavior, positive attitudes may only lead to positive behaviors in such settings where those behaviors are most accessible and encouraged. Further research establishing the likelihood of positive food waste-related behavioral outcomes and how to ingrain those behaviors into long-term practice is necessary.

This study offers insight into the similarities of college-aged adults' food waste perceptions compared to data collected nationally (Neff et al., 2015). Our relatively large sample size and sampling at a university with a relatively diverse student body allow for some generalizations of results to other universities and colleges. On the other hand, the high proportion of residence hall students and freshman respondents in our sample should be acknowledged. Although limited by the restrictions of the residence halls, students in our study still cooked meals sometimes (69%), engaged in meal prep and planning before shopping (77%–81%), and portioned when cooking (76%). Also, our city and university are actively focused on environmental sustainability and climate change. Therefore, some of the positive attitudes may be related to that context.

Individual behavior cannot be separated from its context. Today's food system contributes greatly to making waste a convenient, and even necessary, behavior. Therefore, we must also address the core issues that contribute to food waste at the community and policy levels. Our communities face many food-related challenges, including policies that encourage overproduction of commodity crops, food dumping in poor communities of that excess, junk food culture (also due in part to excess food), food apartheid (as opposed to the term food deserts; Penniman, 2018), confusing food freshness labels, standards that deem nutritious but oddly shaped food unsuitable for sale, inefficient or no compost-

ing infrastructure, and externalized costs that build cheap food on a foundation of worker injustice, just to name a few. Although educational programming can support and facilitate some change, deep work must be done at the policy and community levels to promote a more just, nutritious, and efficient food system overall.

Conclusion

As food waste per household continues to increase worldwide (Thyberg & Tonjes, 2015), food waste programming in educational settings is becoming an important tool to help address this trend (Al-Domi et al., 2011; Buzby & Guthrie, 2002; Merrow, Penzien, & Dubats, 2012; Sarjahani, Serrano, & Johnson, 2009; University of California, Davis Dining Services, 2015; Whitehair et al., 2013; Wilkie, Graunke, & Cornejo, 2015). Improving food-waste related programming at universities provides a unique opportunity for change. Universities provide the structure (students eat many meals on campus) and community (campus culture can be influenced and influence students) for implementing food-related programming, and students are at a prime life stage for change. Research on food waste-related behavior within these settings specifically will ensure that programming is based on a context-specific understanding of the factors that underlie food waste-related behaviors. Addressing specific food waste behavioral factors in programming is important to improving and continuing this work and to developing university and community cultures that are aware and mindful of reducing food waste. 

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Gleaner-farmer relationships: A study of recruitment and relationship development

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Abstract

Food loss and waste is a significant issue in the global food system. The agricultural practice of gleaning—recovery and distribution of unharvested produce directly from farms or the recovery of unsold produce from farmers markets—is seen as a multifunctional intervention, with the potential to address food loss, food insecurity, and the reliance of food pantries on processed food. While research has identified food donation and food recovery programs such as gleaning as potential solutions to issues of food loss and food insecurity, more research is needed to examine the actual communicative organizing practices associated with food

recovery and gleaning efforts. With the aim of better conceptualizing the role that gleaning organizations might play in improving community food security and alleviating food loss, this study examines how gleaning programs develop and maintain relationships in emergency food systems. Based on 12 semistructured interviews with Vermont gleaning professionals, we aim (1) to describe the relationship between gleaning coordinators and farmers, with a focus on effective communication strategies for initiating and maintaining the relationship; and (2) to determine if participation in gleaning can add value to a farm enterprise. Results demonstrate the importance of farmers' sense of community responsibility and gleaners' individualized communication with farmers and knowledge of farming practices to the development and maintenance of gleaning relationships.

Keywords

Agriculture, Food Systems, Gleaning, Community Development, Food Insecurity, Communication, Food Waste, Onfarm Food Loss

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Introduction and Literature Review

Food loss and waste is a significant issue in the global food system. While there are well-documented concerns about the quality of food waste statistics (Bellemare, Çakir, Peterson, Novak, & Rudi, 2017; Committee on World Food Security [CFS], 2014; Xue et al., 2017), the estimations are staggering: in 2011, an estimated 33% of all food produced globally was lost or wasted (Food and Agriculture Organization of the United Nations [FAO], 2015; Gustavsson, Cederberg, Sonesson, van Otterdijk, & Meybeck, 2011). The problem is particularly acute in developed countries such as the U.S. According to recent estimates, 40% of the food produced in the U.S. goes uneaten each year (Gunders, 2012). Food loss remains a challenge at the production level, as market prices are often not enough for farmers to offset the cost of harvesting and packaging their entire yields (Dunning, Johnson, & Boys, 2019; Ishangulyev, Kim, & Lee, 2019). As a result, edible crops are left unharvested. For example, a sample of Vermont farmers in 2015 reported an estimated 16% of vegetables and 15% of berries were deemed “loss but salvageable” (Neff, Dean, Spiker, & Snow, 2018). Developing strategies to address food loss, especially of fruits and vegetables at the production level, is important when 12.7% of U.S. households (15.8 million) are considered food insecure (Coleman-Jensen, Rabbitt, Gregory, & Singha, 2016).

Food recovery and donation programs that capture food loss and distribute it to those in need have the potential to simultaneously address issues of food loss and food insecurity (Evans & Nagele, 2018; Lee, Sönmez, Gómez, & Fan, 2017; Neff, Kanter, & Vandevijvere, 2015; Sönmez, Lee, Gómez, & Fan, 2016). The practice of gleaning—recovery and distribution of unharvested produce directly from farms or the recovery of unsold produce from farmers markets—is seen as a multifunctional intervention, with the potential to address food loss, food insecurity, and the reliance of food pantries on processed food. Furthermore, gleaning programs, particularly those that are inclusive of the individuals that benefit from gleaned produce, can offer additional community benefits such as social support, empowerment, and improvement of community food security (Hoising-

ton, Butkus, Garrett, & Beerman, 2001). However, gleaning also operates in the context of the emergency food system, which has been widely criticized for failing to address the root causes of food insecurity (Tarasuk & Eakin, 2005).

While research has identified food donation and food recovery programs such as gleaning as potential solutions to issues of food loss and food insecurity, more research is needed to examine the actual communicative organizing practices associated with food recovery and gleaning efforts. By developing a better understanding of how gleaning programs develop and maintain relationships in emergency food systems, we can better conceptualize what role they might play in contributing to community food security and alleviating food loss. Specifically, based on 12 semistructured interviews with Vermont gleaning professionals, we aim (1) to describe the relationship between a gleaning coordinator and a farmer, with a focus on effective communication strategies for initiating and maintaining the relationship; and (2) to determine if participation in gleaning can add value to a farm enterprise.

Gleaning and Community Food Security

Gleaning is collecting the food left in farm fields that is not economically or logistically feasible for the farmer to harvest (Beyranevand, Leasure-Earnhardt, & Valentine, 2015). Gleaning can also include collecting and donating excess food from farmers markets, packing lines, and storage houses (Beyranevand et al., 2015). Much of the literature written specifically about gleaning has focused either on how to quantitatively measure and maximize the impact of gleaning (Lee et al., 2017; Sönmez et al., 2016) or has examined the role of gleaning organizations in the communities they serve (Hoisington et al., 2001).

The community impact of gleaning is often analyzed through the critical lens of community food security (CFS). According to Hamm and Bellow (2003), the concept of CFS is defined by a systems approach: “[CFS] is defined as 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” (p. 37). The concept

of CFS encompasses more than the traditional definition of food security, which tends to focus on food access and affordability for low-income populations. Though the lens of community food security certainly focuses on issues of social justice and health, it also acknowledges the importance of fostering “civic agriculture,” a concept first articulated by Thomas A. Lyson (2000): “a locally based agricultural and food production system that is tightly linked to a community’s social and economic development” (p. 42).

Thus far, most studies using the lens of CFS have focused on the recipients of gleaned food in order to measure community impact. Gleaning programs can play an important role in the food system by distributing surplus produce to low income, food-insecure individuals. Most studies agree that gleaning improves diets by increasing access to local, fresh produce for individuals and food distribution sites (Berlin, Schattman, & Hamilton, 2012; Hoisington et al., 2001; Neff et al., 2015; Vitiello et al., 2015). Some gleaning programs, particularly those run by food banks or those that directly involve food insecure populations in the practice of gleaning, have the potential to enhance communities’ capacity to meet their own food needs, and serve to foster a sense of social empowerment (Hoisington et al., 2001; Vitiello et al., 2015).

In addition to empowering community members, there may be measurable benefits for the donors of gleaned food (Lee et al., 2017). The tangible financial advantages of food donation seem to depend heavily on the type of donor (food company or farm), the scale of the donor’s operation, the total volume of donations, and whether the donor has knowledge of or access to financial incentives for donation, usually in the form of tax deductions or credits. Gleaning organizations and food security organizations have also suggested the potential for increased social capital among farmers who participate in gleaning and engage in “cause marketing” (i.e., marketing involvement in charitable programs in order to garner social capital), although again little empirical research has been done to support this (Neff et al., 2015).

However, the promotion of equity and social empowerment is not universal across gleaning pro-

grams. In the context of gleaning, scale and inclusivity are two common CFS criticisms. Gleaning programs with access to large commercial farms result in more fresh produce in food bank distribution, but overlook and may unintentionally condone unsustainable farming practices and needless overproduction (Neff et al., 2015). Moreover, the reliance of gleaning programs on middle and upper-income volunteers can reproduce inequities in the emergency food and alternative food systems (Beischer & Corbett, 2016; Berlin et al., 2012; Tarasuk & Eakin, 2005; Vitiello et al., 2015).

Relationships in the Context of Alternative Food Supply Chains

It is clear that gleaning could play a role in reducing food loss and may, depending on the structure of the program, contribute to community food security. However, little has been written regarding the importance of social relationships—in particular, the relationship between gleaning organizations and farmers—in the success of a gleaning program. The contribution of strong social relationships to success in other areas of the alternative food supply chain, such as farm-to-institution, farm-to-school, and direct market sales, has been well documented (Buckley, Conner, Matts, & Hamm, 2013; Conner, Sevoian, Heiss, & Berlin, 2014; Heiss, Sevoian, Conner, & Berlin, 2014; Izumi, Wynne Wright, & Hamm, 2010; Kloppenburg et al., 2000). In addition, it is clear through anecdotal evidence that the success of gleaning rests largely on the strength of the relationship between a gleaning organization and an individual farmer (Martin & Morales, 2014; Salvation Farms, 2018; Snow & Dean, 2016; U.S. Department of Agriculture [USDA], 2010), although few scholars have empirically studied this relationship.

The importance of social relationships has become a recurring theme in alternative food systems literature, particularly in studies exploring farm-to-institution (FTI) programs. For example, Conner et al. (2014) and Izumi et al. (2010) found that shared goals and values are important to FTI relationships between producers and buyers. Participation in FTI supply chains is motivated by shared values such as promoting good health, encouraging close relationships, and affirming the importance of edu-

cation and community. Shared values were found to play a significant role in mediating relationships and resulted in mutual regard and desire to cooperate. Buckley et al. (2013) found that relationships based on trust and mutual support operate even throughout large and complex FTI networks, and that these close relationships encouraged creativity and adaptive problem-solving.

Gleaning organization guides and reports highlight the importance of strong relationships with farmers (Martin & Morales, 2014; Snow & Dean, 2016; Salvation Farms, 2018; USDA, 2010). For example, the guidebook produced by Salvation Farms, a Vermont gleaning organization, spends several paragraphs outlining best practices for maintaining relationships and communicating with farmers. Suggestions include, “Always follow through on your word, be sure to display your ethic for hard work, have dedication to your work and always be consistent and outwardly thankful” (Salvation Farms, 2018, p. 9). This would suggest that awareness of and respect for the farmer’s business, as well as accountability, are vital to the success of the farmer-gleaner relationship.

Some gleaning guides and promotional materials even indicate that gleaning organizations provide a professional service to participating farmers. The prospectus of the Boston Area Gleaners (BAG, 2016), a document that consolidates the mission, goals, and achievements of the nonprofit, highlights a gleaning “success story” in which an eastern Massachusetts farmer saw a direct benefit from allowing gleaners on his farm. Because the price of tomatoes was so low, this farmer did not have a viable outlet for a bumper tomato crop. By harvesting his abundant tomatoes when the farmer could not afford to, the gleaners facilitated the continued production of his crop and allowed the farmer to wait until the tomato price recovered, and he could afford to harvest and sell his crop.

However, while professional resources exist to help gleaning organizations establish relationships and design messages to farmers, there is little empirical research on the nature of the relationships between gleaning organizations and farmers, and how exactly these relationships are established and maintained. In studying gleaning relationships, our research will contribute to a subject already identi-

fied as important by the literature about alternative food systems and by gleaning professionals themselves. Further, by understanding the outreach strategies and messages used by gleaning coordinators to establish and maintain relationships with farmers, we will gain valuable insight into the potential role of gleaning to add value to a farm enterprise by enhancing overall community food security and reducing on-farm food loss.

Methods

Because of its number of gleaning organizations and the presence of a coordinating body, the Vermont Gleaning Collective, Vermont is an ideal location to study relationships between gleaning coordinators and farmers. The state’s first formal gleaning program began in Burlington in 2004, and by 2015 eight regions in Vermont had community-based gleaning programs (Schattman, Nickerson, & Berlin, 2006). The Vermont Gleaning Collective, established by a large gleaning organization in 2013, is a statewide partnership of autonomous, community-based gleaning initiatives. The Collective staff focuses on providing guidance and technical assistance to gleaning coordinators, with the goal of cultivating professional, effective, and well-managed gleaning programs (Salvation Farms, 2018). Though the Collective includes several large gleaning organizations, there are some newer initiatives and a few long-established programs that are not members of the collective.

Although gleaning programs are thriving in Vermont, these programs also exist to address the familiar challenges of food loss on farms and to alleviate widespread food insecurity. A study done by Salvation Farms, a nonprofit focused on the management of agricultural surplus, found that on Vermont farms alone, an estimated 14.3 million pounds (6.49 million kg) of vegetables and berries were lost each year (Snow & Dean, 2016). At the same time, almost 30,000 Vermont households are food insecure, and lack access to enough food to meet basic nutritional needs (Coleman-Jensen et al., 2016). With the current gleaning infrastructure, food loss, and food security challenges, Vermont is an excellent place to explore relationships between gleaning organizations and farmers that involve these challenges.

Interviewee Recruitment

After receiving approval from the University of Vermont Institutional Review Board, the authors used a purposive sampling technique to identify potential participants. We selected a sample that could provide us with multidimensional, information-rich perspectives on gleaning relationships with farmers (Polkinghorne, 2005). The twelve participants in our study represent nine of the ten gleaning programs currently operating in the state, and each participant plays a significant role in establishing and maintaining gleaning relationships

between their organizations and local farmers.

All of our participants self-identified as white, and all but two were female. Interviewees ranged in age from 22 to 72. Ten of the 12 had experience either working with farmers or in production agriculture prior to their current position. Most of the gleaners we interviewed were paid, full-time staff of Vermont nonprofits dedicated to food security and/or sustainable farming. Many of the gleaning coordinators were hired through the AmeriCorps Vista program. We only encountered two gleaning coordinators in Vermont who were not paid staff

members of an organization; one was a retired individual volunteering, and the other was a college student in a campus leadership role. Table 1 provides demographic information, position title, and experience for gleaning coordinators, and Table 2 provides information about their organizations.

A few organizations represented by participants were quite new and had been operating for less than one year.

Table 1. Gleaning Coordinator Information

Name	Title	Age	Gender	Gleaning Coordinator (years)	Farm Experience
Irene	Local Food Access Coordinator	25	Female	1.25	Yes
Helen	Executive Director	38	Female	14	Yes
Emma	Branch Manager	26	Female	2	Yes
Abby	Gleaning and Food Rescue Coordinator	25	Female	3	Yes
Amy	Gleaning Coordinator	23	Female	2	Yes
Lauren	Founding Director	37	Female	3	Yes
Ivan	Operations Manager	56	Male	0	Yes
Logan	NA	22	Female	2	Yes
Rebecca	Gleaning Coordinator	22	Female	1	No
Nora	Gleaning and Community Outreach Coordinator	30	Female	3	Yes
Rachel	Gleaning Volunteer Coordinator	72	Female	5	No
Andrew	Executive Director	37	Male	0	Yes

Table 2. Gleaning Organization Information

Gleaning Coordinator	Location	# of Farmers	# of Donation Sites	# of Staff	# of Volunteers	Lbs. Gleaned ^a
Irene	Rural	29	14	1	164	34,250
Helen	Rural	13	24	1	115	60,000
Emma	Rural	80	300	2	1,000	400,000
Abby	Urban	16	18	6	419	40,820
Amy	Rural	10	18	2	19	10,600
Lauren	Rural	30	15	1	280	30,000
Ivan	Rural	12	60	2	100	82,480
Logan	Rural	3	2	2	NA	260
Rebecca	Urban	24	28	1	108	29,854
Nora	Urban	15	150	4	250	471,000
Rachel	Rural	10	55	2	140	78,000
Andrew	Rural	25	60	1	150	200,000

^a 1 lb. = 0.45 kg.

Other gleaning programs were relatively well-established and had been gleaning for up to fifteen years. Some organizations belonged to the Vermont Gleaning Collective, while others either did not know about the collective or had chosen to operate outside of the collective. Gleaning programs also differed in organizational capacity: organizations worked with three to 80 farmers, two to 300 recipient sites, engaged 19 to 1,000 volunteers, and gleaned 260 to 471,000 pounds (118 to 214,000 kg) of produce through in-field gleaning, on-farm pickups and farmers market collections in 2016 alone. This diversity of informants gave us a comprehensive view of the process of relationship-building with local farmers. While we interviewed three participants from the same organization, these three informants represent a particularly large gleaning organization. In addition, each informant brought a unique perspective to our study of farmer-gleaner relationships, in terms of their experiences working with farmers, caseloads, and professional background prior to gleaning.

Semistructured Interviews

We prepared a semistructured interview guide to provide some structure for the interviews, but we also adapted the questions to fit the experience of each participant (Lindlof & Taylor, 2011). Our two primary questions focused on the types of things gleaning coordinators said or did to initiate and maintain gleaning relationships. Though we did ask a third primary question about what might cause a gleaning relationship to deteriorate, we found that most participants had not experienced the deterioration of a gleaning relationship. Primary questions were nondirective, allowing the subject to define the scope of his or her answer (Lindlof & Taylor, 2011). In follow-up probes, the interviewers attempted to clarify statements or stories, and elicit examples of specific relationships that might demonstrate the process of relationship-building in practice. Each researcher conducted six interviews. To maintain consistency, the researchers met frequently during data collection to discuss interview experiences and emerging themes. The interviews were audio-recorded and immediately transcribed verbatim. All names and identifying information were replaced with pseudonyms in order to main-

tain the confidentiality of interviewees and their respective organizations.

Thematic Analysis

Thematic analysis is a qualitative technique used to identify, analyze, and report patterns or themes within data (Braun & Clarke, 2006). Initially, both researchers read and coded the entire dataset separately. This process yielded several codes and themes within the data. We then worked together to engage in focused coding to identify broader underlying themes that were reoccurring across participants and across researchers' codes.

Analysis

As gleaning coordinators emphasized the importance of setting up professional relationships with farmers, we will first describe the primary characteristics of a professional gleaner-farmer relationship. In addition, several interviewees observed that farmers participated in gleaning to contribute to their community, broaden access to local food, and reduce on-farm food loss. We found that the gleaner-farmer relationship facilitated the farmer's expression of community values and alleviated some of the guilt associated with on-farm food loss.

Attributes of a Professional Gleaner-Farmer Relationship

Gleaning coordinators focused on establishing professional relationships with farmers. As participants described characteristics of successful gleaner-farmer relationships, two main themes emerged, that the relationships were grounded in trust and a farmer-centered process.

Trust. Interviewees stressed the importance of establishing trust with a farmer. Some gleaners established this trust by emphasizing their experience with production agriculture. For the farmer, knowing that a gleaner was comfortable with harvesting helped ease the anxiety that can come from hosting a group of volunteers in their fields. When initiating a relationship with a farmer, Emma stressed, it was important "that we're really careful, that we're trained farmers who know what we're doing and have . . . all the equipment that we need. Basically that we're a self-sufficient operation once we're on

the farms.” Emma found that highlighting her own agricultural experience was critical to establishing trust with a farmer. Logan also found that when she communicated her agricultural knowledge to a farmer, she felt that, “The farmers . . . have more trust in what’s going on and kinda leave us alone while we’re gleaning.” If a farmer knew that Logan had the necessary skills to lead a crew and harvest responsibly, the farmer trusted that the gleaning group would complete their task and leave everything else as they had found it.

In addition to emphasizing their overall agricultural competence, several gleaning coordinators mentioned the importance of learning about each farm operation. Interviewees found that expressing an interest in the farm enterprise beyond the details necessary for a successful gleaning event was important to establish a good working relationship. Irene spoke of a “communication investment of [*sj*] what their farm is doing. Not necessarily even related to gleaning . . . asking what their farm operation is.” Irene tried to understand the structure of the farm enterprise, including crops cultivated, market channels, and level of mechanization. Although she did not necessarily need these details to organize gleaning events, with this “communication investment,” Irene demonstrated that she was invested in the farm business beyond the pounds of produce donated to her organization. Rachel also remarked that being familiar with a farm’s current regulatory challenges, such as complying with federal food safety laws, was part of cultivating a good relationship. She continued, “I’m interested in it [the new food safety laws], and it certainly helps me to be more appreciative and, you know, kind of knowing why they do what they do and so forth.” Helen summed up the importance of understanding production agriculture and demonstrating a commitment to the farm:

If you can’t prove to them [the farmer] that you understand their farm business, that you understand farm operations and the realities that farmers face every day . . . you know they may engage, but I think they aren’t going to feel . . . you know, a full sense of security and trust that you are going to do right by their farm on many levels.

If a gleaner highlighted her agricultural knowledge and her commitment to the farm as a business, then a farmer could trust that the gleaner and her volunteers would harvest un-marketable produce with respect for his potentially marketable crops nearby.

Several gleaning coordinators also mentioned that visiting farms, particularly at the beginning of a relationship, was an important part of establishing trust. A farm visit offered the opportunity to understand the farm operation further, and allowed the gleaner to gather important details related to gleaning. When asked why she visited farms at the beginning of a gleaning relationship, Amy said, “I think it’s great for relationship building, just meeting them face-to-face. And it’s also a time for them to show us their operations. . . and just, I think it’s really mostly relationship building, and building that trust with people.” By taking the time to visit the farm at the beginning of a relationship, Amy demonstrated her commitment to the farmer and his business. Amy’s goal was to build trust in herself and her organization so that when she came to the farm to glean, the farmer could trust that she and her volunteers would respect the farm business.

Gleaners also visited farms not only at the beginning of a relationship but at the beginning of each season to gather the details necessary for a successful gleaning event. Through their attention to detail, gleaners demonstrated to the farmer their commitment to supporting the business as a whole. At the beginning of any relationship with a farm, Lauren tried to “visit that farm ahead of time, just so I get a feeling for like, you know, where things are, where we would park . . . those kinds of things.” Similarly, Rachel sought to “make a visit to see what it is and to see what the scene is and how we would work there and so forth; just make a personal contact.” Abby said that she often visited established gleaning farms at the beginning of each season, “to have them [the farmers] show me where I’m going to be going, and . . . where to drive when we’re on the field, and these are where the pipes are. Just to get the lay of the land.” By visiting and getting to know the details of the farm operation, gleaning coordinators demonstrated to the farmer that they took their positions seriously,

and wanted to make sure they did not negatively impact other aspects of the farm business during gleaning events.

Farmer-centered process. Farmers and gleaners worked together to design a gleaning schedule and a communication routine that fit within a farmer's needs. Several gleaning coordinators mentioned the importance of emphasizing the overall flexibility of the gleaner-farmer partnership. When introducing gleaning to farmers, Amy explained that gleaning "could be as simple as we can arrange it." She continued, "you can text me on Monday and then on Wednesday we can come out with groups of people for two hours." To fit gleaning into a farmer's busy schedule, Amy tried to be as flexible as possible, even if it meant scheduling gleans just two days ahead of time. Nora also tried to stress the ease of incorporating gleaning into a farm operation. She remarked, "I try to say how flexible it is...there's never any pressure. And I just try to really implement consistency and ease." Nora sought to conduct her relationship with farmers "like a customer service relationship." Gleaning coordinators described working with farmers based on the needs of the business, and making the gleaning process and communication routines as easy as possible. Helen aimed at designing "a partnership that works for them, at their comfort level." Gleaning coordinators recognized that no matter how well-organized they were, participation in gleaning required extra effort for a farmer. Because they understood production agriculture, gleaners also knew that farmers did not have extra time to dedicate to gleaning. To address this, gleaning coordinators highlighted the flexibility of the gleaner-farmer relationship, and focused on designing a process and communication routine that worked for the farmer.

Some participants found that the most successful partnerships involved setting up a consistent weekly glean for a farm. Andrew pointed out that "consistency and routine is, like, the bread and butter of a farmer . . . and so we've worked to provide that to them." Andrew explained that many farmers make a rough plan at the beginning of each week. If gleaning is on a farmer's schedule, they can integrate it into their weekly plan. Andrew pointed out that a consistent weekly gleaning

schedule was also beneficial for his organization. He explained that if he just sent an email to all the farmers in the area, introducing the idea of gleaning and asking the farmer to get in touch if they had anything to offer, farmers would be too busy to respond. If farmers integrated gleaning into their weekly plan, then his organization could count on produce to distribute from that farm each week. Similarly, Abby observed that if she set up a weekly glean, "that farmer knows . . . OK, I could till this in and plant something new today. But, Abby's coming tomorrow, I'll do something else this afternoon, and I'll till that in after Abby leaves." With an established weekly glean, farmers could easily integrate gleaning into their operations, and gleaning organizations could count on a relatively consistent supply of produce.

Gleaners also established consistency in their communication practices with farmers. The specific mode of communication depended on the needs of the farmer, but could include text messages, email, phone calls, and/or in-person. Abby, who has standing weekly gleans with a few farmers, explained that "after that first initial email, week of gleaning, then it becomes mostly just text messages." She continued, ". . . I'll send a text message the night or two before, usually the night before, saying, 'still planning on coming tomorrow, sounds good, is there a place I should meet you?'" A consistent texting schedule was the most convenient communication routine for the farmer, so Abby adopted the farmer's desired mode of communication. Like Abby, Rebecca also coordinated weekly gleans. She described her communication routine with one farm as less regular than the routine Abby described. While Rebecca has a standing weekly glean at a particular farm on Thursdays, sometimes, she said, "[The farmer] might text me and be like, 'We're tilling this row, do you want to come out Monday afternoon and just glean super quick to get it?'" The combination of last-minute gleans and a standing weekly glean worked for this farmer, so Rebecca adapted to this communication routine, although she wasn't always able to harvest at the last minute. Rebecca indicated that she communicated with farmers based on what worked for their business. Describing her pick-up schedule at a large farm's farm stand: "They're busy so I just try and

get out so that they don't have to think about it, and just take it and go; because that's what fits their business model, which is fine." Similar to other gleaning coordinators, Rebecca was flexible in her communication and the design of her farm partnership in order to meet the needs of the farm.

Gleaning Adds Value

The gleaner-farmer relationship can also add value to an agricultural enterprise by providing a way for a farm business to express its values. While there are a variety of motivations for farmers to participate in gleaning, interviewees regularly mentioned values as a driving force for participation. Two values were mentioned as being fundamental: contributing to the community and reducing food loss on the farm.

Contributing to the community. Several interviewees said that for many farmers, participation in gleaning was a way for them to give back to their communities and address inequities in food access. Abby, a gleaning coordinator for an organization with a few long-term gleaning partners, said of one farm, "They have a huge food justice component to their farm's mission statement . . . so they're just really committed to feeding their neighbors." This farm was dedicated explicitly to providing access to good food for all community members, so participation in gleaning was an obvious way for them to fulfill this mission. Logan, a gleaning coordinator for a relatively new organization, described farmers' feelings of community obligation in more personal terms: "They all . . . are part of the community, have friends in the community, and want to do their part to share any surplus that they have." In Logan's experience, many farmers recognize that food security is "a major problem that needs addressing," and are committed to donating their surplus. For some farms, the desire to give back to their community was part of their mission, while for other farms, the desire to give back to their community was driven by a sense of obligation.

A few interviewees also spoke of the responsibility that farmers felt to contribute to the community, specifically because not everyone was able to afford their produce. Andrew, a key figure in a large gleaning organization:

To be honest, local farms in our area . . . for the most part . . . their products are usually more expensive . . . So there's . . . I guess you would say a social justice mission there of providing good food for everybody no matter whether they can afford it or not.

Although farmers in this region of Vermont felt that they needed to sell their products at a higher price to remain viable as a business, in Andrew's experience, most farmers recognized that not all members of their community could afford their products. Rachel, another critical figure in the same organization, said that farmers recognize that ". . . a lot of the people can't afford to buy their food, and they feel that they want to support the community . . . if they donate to [the gleaning organization], they're supporting the community in that way." Similarly, Helen framed gleaning as a way to provide ". . . food to people that have limited access and need to have a cost-free opportunity to explore with fresh foods." In the experience of gleaning coordinators, participation in gleaning allowed farmers to help alleviate unequal access to local produce.

While gleaners recognized farmers' sense of responsibility and helped them to express their community values through gleaning, they also made sure that the gleaner-farmer relationship remained professional, and did not rely solely upon the farmer's altruism. For example, Irene said that when she approached a farmer, she tried to underscore that she understood,

that this [gleaning] is not some mushy-gushy charity case work for you, that . . . yes, you see a need and that is why you're doing it, and you want to help the community, but at the end of the day, you have to get a job done. And I want to show you that, you know, this can, can fit within what your needs are.

Irene's approach recognized that many farmers were motivated by community values, but also demonstrated that she understood the extra effort required to participate in gleaning. Irene did not approach farmers as a nonprofit representative seeking donations; rather, she introduced gleaning

to farmers as a professional service that could offer their surplus to people in need. Emma also acknowledged that although farmers often wanted to donate their surplus produce, it was most important for her to emphasize the competency and professional nature of her organization. Emma described the most effective approach:

... highlighting your own farming experience, trying to make them comfortable with you being at their farm. Because if you sort of approach it as like, “I work for this nonprofit, we’re all about charitable food . . .” Yeah, everybody can buy into that, but it doesn’t ease the feeling of having strangers on your property picking your food.

Gleaning coordinators recognized that many farmers had a desire to contribute to their community. However, most did not emphasize this aspect of participation in gleaning. Instead, coordinators underscored the professional characteristics of the relationship they sought to establish with farmers in order to meet their shared goal of serving their community.

Reducing food loss. In addition to farmers’ desire to contribute to their communities, interviewees also noticed that many farmers wanted to participate in gleaning because they did not like to see their product, something that they had put time and money into growing, go uneaten. When asked why farmers participate in gleaning, Rebecca said:

When I’ve spoken with farmers, it’s like . . . “We grew it . . . and it looks great and I see it rotting in the field, and I know there’s people that need it. And we don’t have the capacity to harvest it or the market to sell it, and we just want to see . . . someone using it.”

In a perfect world, farmers would be able to sell everything they grew. In reality, due to a wide variety of constraints, this is rarely possible. Nora, a gleaning coordinator for a different organization, saw participation in gleaning as a simple way to put excess produce to good use: “I think no one likes to see vegetables go bad. We’re the easy way to gather those vegetables, then I think [the farmers

are] usually happy to participate.” Emma, a coordinator for the same organization, summarized: “To be able to rely on a gleaning organization to come in on a scheduled basis and handle that entity for you, it removes so much of the guilt associated with food loss and food waste.” According to gleaning coordinators, both farmers and gleaners do not want to see edible surplus in the field go uneaten. Many farmers take advantage of gleaning programs to reduce on-farm food loss.

Although most gleaning coordinators stated that farmers did not like to see their food go uneaten, a few had mixed feelings about emphasizing the ability of gleaning to reduce food loss. In particular, Andrew felt strongly about not framing surplus produce as “waste”:

Especially in the farm’s case, it’s not wasted, it’s nutrients, it’s going back to the soil, it’s being composted . . . there is a benefit to the farm in keeping it there . . . of course, the highest and best use of the food would be as food. So . . . they see it as . . . an opportunity to have more of a value to the community at least by giving it away.

While Andrew acknowledged the ability of gleaning to reduce on-farm food loss, he did not see this as the most important motivation for participation in gleaning. Instead, he was careful to frame gleaning as a way to add value to surplus produce by offering it to community members in need. Several other gleaning coordinators recognized a tension in the idea that participation in gleaning could help reduce food loss on farms. Abby said, “Occasionally [a farmer she has worked with] has stuff that he can’t keep up with . . . I think his mindset is like, I’m inviting gleaners on my farm, that is a crop that I put money into that I’ve lost. And it’s a bummer for him.” Abby recognized that agricultural surplus was not necessarily a positive thing for farmers. A farmer plants and cultivates a crop with the intention of selling it. To a farmer, surplus represented a loss of time and money invested. Gleaning coordinators observed that some farmers did not see agricultural surplus as waste at all, while other farmers saw surplus as a crop that they were not able to sell. When surplus

did occur, participation in gleaning helped to reduce some of the associated guilt by allowing a farmer's hard work to go to its highest use—feeding people.

Discussion

Gleaning coordinators focused on setting up professional relationships with farmers. They began by establishing trust with a farmer and tried to define a process and a communication routine based on the needs of the farmer. In addition, gleaning coordinators found that once a successful relationship was established, participation in gleaning could provide several services for the farmer, many of them indirect. However, in the experience of the gleaning coordinators whom we interviewed, the primary reasons that farmers participated in gleaning were to contribute to values shared by farm enterprises and gleaning organizations: contributing to the community and reducing on-farm food loss. The ability of farmers to express these shared values was based largely on the strength of the relationship between the gleaning organization and the farmer. Although gleaning coordinators acknowledged that community values and food loss reduction were primary motivations, most gleaning coordinators chose to emphasize the professional nature of their organization and gleaning process.

The implications of our analysis are relevant to many geographical contexts beyond our sample in Vermont and make an important contribution to broader conversations about food waste solutions. Nationwide, gleaning organizations are valuable for the opportunity to reduce both food waste and food insecurity in communities (Hoisington et al. 2001). The gleaner-farmer relationship is at the crux of facilitating this process and, without respecting and understanding the importance of those relationships, the opportunity could be lost.

Theoretical Contributions

Our study found that the ability of farmers to contribute to their community and reduce on-farm food loss through gleaning is facilitated by the professional nature of the gleaner-farmer relationship. Through this relationship, a gleaning coordinator creates a farm-centered process through which a farmer can contribute to the community and re-

duce on-farm food loss. The primacy of social relationships in gleaning echoes the work done by scholars in the realm of farm-to-institution supply chains (Buckley et al., 2013; Conner et al., 2014; Heiss et al., 2014) and farm-to-school (Conner et al., 2012; Izumi et al., 2010), and reflects the emphasis more generally on social relationships as an important component of the alternative food system (Kloppenborg et al., 2000; Lyson, 2000). Conner (2014) and Izumi (2010) also recognized supporting community as an important shared value of members of the FTI supply chain. Both gleaners and farmers value community, and farmers rely on the professional relationship created with gleaning organizations to express this value.

Practical Implications

Our study provides several practical implications for the future of gleaning. First, we offer empirical evidence for advice that already has been documented anecdotally: the importance of a professional gleaner-farmer relationship. Participants described successful and productive relationships with farmers as based on trust, flexible processes, and farmer-centered communication. Gleaning coordinators should continue to establish clearly defined professional relationships with farmers. Beyond the characteristics of the professional relationship outlined in gleaning guides, coordinators should demonstrate agricultural knowledge and commitment to the success of the farm enterprise. Gleaners should also focus on setting up a unique process and communication routine that fits the needs of each particular farm.

Participants also agreed that farmers were motivated to participate in gleaning by community values, and by a desire to see their surplus go to its highest use—food for people. However, few gleaning coordinators explicitly linked these concepts, and pitched participation in a professional gleaning relationship as a way for farmers to contribute easily to the community. Some gleaning coordinators highlighted the potential community contribution in initial discussions with farmers, and a few discussed advertising farm participation. Gleaning coordinators should draw a clear connection between a farmer's desire to contribute to the community, and the ease and professional nature of a gleaner-

farmer relationship. Further, coordinators should explore ways to market farm participation in gleaning so that the community is aware of their contribution. In addition, it was clear that in the experience of gleaning coordinators, as well as in general, that farmers respond differently to the idea of agricultural surplus as food loss or waste (Beausang, Hall, & Toma, 2017). Regardless of farmer opinion on this topic, gleaning coordinators can also emphasize participation in a professional gleaner-farmer relationship as a way for a farmer to ensure that their surplus goes to its best use, as food.

Second, scholars have discussed the efficacy of financial incentive policies to support increased food donations through gleaning (Lee et al., 2017). However, while financial incentives would likely be helpful, according to our research they are not the perceived primary factor that drives participation in gleaning. Rather, as gleaning coordinators report, farmers are busy, and current federal tax deductions are difficult to navigate. Thus, regardless of financial incentives, farmers are driven already to participate in gleaning by a sense of community obligation. This indicates that financial incentives for participation may not be needed on the farmer side. Resources and infrastructure should, therefore, be directed towards gleaning organizations themselves, as has been suggested by other research (Lee et al., 2017). Improved infrastructure and staffing would allow gleaning organizations to set up even more professional, consistent relationships with farmers. In addition, gleaning organizations would be able to more thoughtfully market farmer participation and communicate information to farmers about produce recipients.

Limitations


There are several limitations to our analysis. First,

results speak to the experiences of gleaner-farmer relationships; however, only the experiences of the gleaners were collected for this study. In sections of the analysis, gleaners provide their perspective on how farmers view gleaning organizations and how they may value the relationship. To fully understand the gleaner-farmer relationship, future research should interview farmers for a first-hand account of their experiences.

An additional limitation to our study is the lack of demographic variability among study participants. Most of the gleaning coordinators were female and in their 20s and 30s. Most gleaning coordinators in Vermont have some previous farm experiences, which may allow them to anticipate better the needs and expectations of farmers they work with than many gleaners in the U.S. The homogeneity of participants is consistent with the larger population of Vermont but may exclude backgrounds of many of those who participate in gleaning nationwide.

Conclusions

While gleaning has the potential to provide a number of services to farms, this study found that gleaners perceived participation in gleaning programs as being motivated by shared community values. Specifically, gleaners observed that farmers were motivated by a desire to improve community food security and reduce on-farm food loss. A partnership with a professional gleaning organization is an easy way for a farmer to express these values. This nontraditional understanding of farmer motivation builds upon the importance of community values and social relationships in local food systems. It is our hope that policymakers and future researchers continue to explore the viability of the role of gleaning in the alternative food systems.



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Farm-to-school grant funding increases children's access to local fruits and vegetables in Oregon

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Abstract

We undertook this study to measure the reach of Oregon's legislated farm-to-school grant program among school districts and children, particularly low income, and examine changes in local purchasing, particularly fruit and vegetables, and the use of produce from school gardens in school meals. We conducted descriptive analyses to examine the

reach and paired two-sample t-tests to examine average purchases of local products between school year 2014–2015 (baseline) and 2015–2016 (intervention). The study results indicate that the number of nonwhite students attending a district participating in farm-to-school nearly doubled in the intervention, and 89% of children eligible for free and reduced-price meals attended schools in participating districts compared with 39% of eligible children at baseline. Eighty-one percent of participating districts were low income, which is much higher than the percentage of districts characterized as low income statewide (65%). The policy also increased the average total local food purchases for low-income districts, particularly fruits and vegetables. The results suggest that the opt-in approach to the grant program facilitated greater

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participation from low-income districts that may otherwise have not accessed the grant program. Oregon's policy approach of designating funds for procurement and/or education grants (versus generic farm-to-school grants to be used at the discretion of the district) enabled the prioritization of these activities in grantee districts. Future research can help develop a more thorough understanding of the long-term impacts of Oregon's farm-to-school policy on children's health outcomes and on other intended outcomes on farmers and the local economy.

Keywords

Farm to School, School Meals, Grant Funding, Fruits and Vegetables, Low Income

Introduction and Literature Review

Farm-to-school implementation differs by site but includes at least one of three core elements: (1) procurement of local foods for cafeteria meals, snacks, or taste tests; (2) educational activities related to agriculture, food, and nutrition; and (3) hands-on learning activities through school gardens (National Farm to School Network [NFSN], n.d.). Several studies indicate that farm-to-school activities provide an opportunity for students to experience local food in school meals and increase their knowledge of, preference for, and consumption of fruits and vegetables through involvement in educational activities (Bontrager Yoder et al., 2014; Joshi, Azuma, & Feenstra, 2008; Koch, Wolf, Graziose, Gray, Trent, & Uno, 2017; Kropp et al., 2018; Morris & Zidenberg-Cherr, 2002; Murphy, 2003; Schmidt, Kolodinsky, & Symans, 2006; Ratcliffe, Merrigan, Rogers, & Goldberg, 2009; Savoie-Roskos, Wengreen, & Durward, 2017). Children in the United States underconsume fruits and vegetables (National Cancer Institute [NCI], 2018). However, since children consume as much as half of their daily calories at school (Cullen & Chen, 2017), making farm-to-school one of several potential strategies for improving comprehensive nutrition programs could increase fruit and vegetable consumption in preschool through high school (Hayes, Contento, & Weekly, 2018).

Farm-to-school programs are more likely to be operational in states with farm-to-school policies

that support local procurement, school gardens, and/or experiential education activities (Schneider, Chriqui, Nicholson, Turner, Gourdet, & Chaloupka, 2012). Forty-six states, the District of Columbia, and one territory have farm-to-school legislation in process or in place (NFSN & Center for Agriculture and Food Systems, 2019). However, support of the three farm-to-school core elements (local procurement, school gardens, and experiential education) varies significantly by policy. The overall policy strategies (grants, incentives to purchase local product, proclamations, and/or staffing at state agencies) also differ.

These differences pose a challenge for generalizing the impact of policies on program implementation across states. Using data from 2006 through 2009, Nicholson, Turner, Schneider, Chriqui, and Chaloupka (2014) found that schools in states with farm-to-school-supported laws served higher amounts of fruits and vegetables in school meals.

In 2007, Oregon was one of the first states to pursue legislation to formalize a grant program for the procurement of local foods and educational activities related to farm-to-school. While the 2007 bill did not pass, legislation supporting a farm-to-school pilot program passed into law in 2011. In 2015, Oregon's legislature passed a more comprehensive bill, which had a unique opt-in feature for procurement. Through this bill, schools automatically received funds to implement farm-to-school procurement, compared to prior state policy that only offered grant funding to Oregon schools through a competitive program.

Previous studies have indicated that school districts with lower per capita income have the lowest probability of serving local food (Ralston, Beaulieu, Hyman, Benson, Smith 2017). McCarthy, Steiner, and Houser (2017) similarly found that as the percentage of students eligible for free and reduced-price lunch at a school increased, the odds of having a farm-to-school program decreased. The opt-in feature of the Oregon policy in question is relevant because all districts (irrespective of free or reduced-price meal eligibility) could opt-in to receive grant funds. These funds could be used for local procurement without a formal application process, hence reducing the barriers to participation, particularly among low-income districts

This study on Oregon's first of its kind farm-to-school policy can provide guidance on best practices for revising current state policy or creating new farm-to-school programs. This paper aims to evaluate the opt-in procurement feature of Oregon's farm-to-school grant program during the 2015–2016 time frame. Specifically, this paper will: (1) examine reach into Oregon's school districts and children, particularly low-income children; (2) examine expenditures on local purchasing, particularly fruits and vegetables, and the use of school garden produce in school meals among procurement districts; and (3) compare the impacts of the opt-in and competitive policy strategies.

Methods

Intervention

Since 2011, the Oregon legislature has passed several bills that we define as the three “eras” of Oregon farm-to-school: a pilot program, a competitive program, and an opt-in program:

- 2011: A pilot program was administered to assess whether competitively awarded grant funding facilitated the purchase of Oregon-grown and -processed foods, particularly in low-income districts. The grant program also implemented farm- and garden-based educational programs in over half of the districts that applied (US\$200,000 disbursed to 11 school districts out of 20 applicants) (House Bill 2649, 2013).
- 2013: A competitive grant program was administered with similar procurement and education components as the pilot program with a funding increase of US\$1 million (total of US\$1.2 million disbursed to 22 school districts out of 33 applicants in the 2013–2015 biennium).
- 2015: The grant program received a one-time infusion of US\$3.3 million and separated funds for procurement (80%) and education (20%) grants (total US\$4.5 million in grants for 2015–2017 biennium).
 - Procurement grants included an opt-in feature with funding allocation prorated

for average student participation in the National School Lunch Program (NSLP) (124 districts out of a total of 212 opted in for 2015–2016; 144 districts opted in for 2016–2017).

- Education grants continued to have a competitive application (Upstream Public Health & Oregon Farm to School and School Garden Network, 2018) with priority for organizations serving a high percentage of free and reduced-price lunch-eligible students in the NSLP (24 grants awarded out of 55 applicants, serving 30 school districts).
- 2017: Grant funding was maintained at US\$4.5 million for the 2017–2019 biennium with modifications:
 - Procurement grants continued to be opt-in and received 80% of overall funding, but could not be used to supplant existing purchases of Oregon-grown foods.
 - Education grants continued to be competitive, but eligibility criteria expanded.

Data Sources

This study used two data sets from the Oregon Department of Education (ODE). The first data set was 2014–2016 data from the opt-in procurement grantees. Baseline survey data were collected in September 2015, which was before implementation of the opt-in procurement grant program and reflected local procurement activities from 2014–2015; intervention survey data were collected in September 2016, a year after the start of the opt-in program. These data provided information on each grantee's farm-to-school activities (e.g., use of materials to promote Oregon foods, incorporation of school garden produce into cafeteria meals, taste tests, total food budget for school meals); local procurement methods (e.g., direct purchase, wholesaler or distributor, growers' cooperative); and types of local foods purchased. This includes the amount of food budget expended on different local product categories (e.g., processed fruits and vegetables, unprocessed fruits and vegetables, grains, dairy, beef).

The second data set was district-level data on student enrollment, race, and free and reduced-price lunch eligibility, which are collected annually by ODE. This study used these data from 2014–2015 (baseline) and 2015–2016 (intervention) to capture the number and demographics of students reached by the opt-in procurement grant program.

Data Quality

The quality of some of the ODE baseline and intervention data was problematic because districts were not required to track information on local food purchases before receiving grant funding during baseline. Additionally, districts were learning the reporting process during the intervention year. ODE performed quality checks on the data, particularly for district food expenditures, and flagged inconsistencies and missing or unrealistic numbers between baseline and intervention data. To address the discrepancies, ODE first telephoned district grantees to discuss the reported data. For fruits and vegetables, 58% of discrepancies were corrected by telephone. If ODE did not receive a response, they used data from the district's reimbursement claims to update the data, which corrected 25% of the discrepancies for fruits and vegetables—a conservative correction because the district could have purchased more local products than were shown in its reimbursement claims. ODE updated the remaining 17% of fruit and vegetable discrepancies from reports submitted by distributors who worked with the districts. This correction is also conservative because districts can purchase products directly from farmers.

Additionally, ODE's baseline year and intervention year reports did not collect data on whether the districts received funding to purchase local foods from sources other than the ODE grant program. These reports also did not provide information on whether U.S. Department of Agriculture (USDA) entitlement funds for school meal programs were used to purchase local products.

Data Analyses

Demographic characteristics of all of Oregon's school districts were descriptively compared with the demographic characteristics of districts that participated in the opt-in program. This compari-

son was used to understand the opt-in program's reach, especially into low-income school districts. A paired two-sample *t*-test was used to determine whether the average purchases of local products (all products and specifically local produce) were significantly higher the year of the intervention compared with the baseline. We tested the difference for all opt-in districts, for low-income opt-in districts, and for high-income opt-in districts. A low-income district was defined the same as Title I: 40% of students enrolled in the district qualify for free and reduced-price lunches (U.S. Department of Education, 2018). Opt-in districts were defined as those districts choosing to receive procurement funds for 2015–2016. Reach measures included the number of students who attended school in an opt-in district; students participating in federal school meal programs in opt-in districts; opt-in districts' expenditures on local food purchases, particularly fruit and vegetable purchases; and opt-in districts that incorporated school garden produce into cafeteria meals. Special attention was paid to low-income opt-in districts because these districts serve a larger proportion of children participating in the school nutrition programs, and the amount of grant funding districts received depended on NSLP participation.

RTI International's Committee for the Protection of Human Subjects, which operates as RTI International Institutional Review Board, reviewed the study and deemed it exempted from Institutional Review Board approval.

Results

Oregon public school student enrollment in 2015–2016 was approximately 576,400 students, with 75% to 78% of Oregon's school-aged population attending public schools. The ODE consists of 212 school districts and 1,485 schools. Table 1 provides some characteristics of all Oregon school districts compared with the opt-in districts. For example, of the 124 opt-in school districts, 100 (81%) were low-income districts, much higher than the percentage of districts characterized as low income (65%) statewide. A larger proportion (49%) of opt-in districts were medium-size districts with fewer small districts choosing to opt-in. Furthermore, only 10% of all districts had the opportunity to

Table 1. Demographic Characteristics of Oregon School Districts (N=212) and Opt-In Grantee Districts (N=124) for 2015–2016

	Percentage of All School Districts (n)	Percentage of Opt-In Districts (n)
District Size		
Small (1–999 students)	59% (125)	38% (47)
Medium (1,000–6,999 students)	33% (70)	49% (61)
Large (more than 7,000 students)	8% (17)	13% (16)
District Income Status ^c		
Low income	65% (138)	81% (100)
High income	15% (32)	19% (24)
Unknown ^a	20% (42)	
% Nonwhite Students ^{a, b}		
0–25%	63% (134)	57% (67)
26–50%	26% (56)	31% (37)
51–75%	9% (20)	11% (13)
76–100%	1% (2)	1% (1)
% Students Eligible for Free and Reduced-Price Lunch ^{a, c}		
0–25%	10% (22)	2% (3)
26–50%	25% (53)	33% (41)
51–75%	49% (103)	56% (70)
76–100%	8% (16)	8% (10)
District Participated in the Competitive Program ^d	10% (22)	17% (21)
District Participated in the Opt-In Program ^d	58% (124)	100% (124)

Note: Low-income district was defined as 40% of children enrolled in the district qualify for free and reduced-price lunch. Districts were included if they provided both baseline and intervention data.

^a Because the district is too small, data are not provided to protect confidentiality. District income status was known for all opt-in districts.

^b Race and ethnicity data are from ODE (2019b).

^c Free and reduced-price lunch data are from ODE (2019a).

^d Data from ODE (2017, September 26).

participate in the competitive grant program compared with 68% of districts participating in the opt-in program.

Reach of the Opt-In Grant Program

Twenty-two districts participated in the competitive program in the baseline year compared with 124 districts in the intervention opt-in program. Table 2 shows that 88% of children in Oregon public schools attended districts participating in the intervention, an increase of 118% compared with the competitive program. The opt-in program also reached 96% more nonwhite children compared

with the competitive program (approximately 89% of nonwhite students in the Oregon public school system were reached compared with 46% under the competitive program). Furthermore, the number of children eligible for free and reduced-price lunch participating in the opt-in program increased by 123% compared with the competitive program, reaching 78% of eligible children.

Change in Local Purchasing with the Opt-In Grant Program

Procurement grant funds for 2015–2016 totaled US\$1.8 million; grant funds received by individual

districts ranged from US\$279 to US\$166,596 with an average of US\$14,605. The amount of funding depended on the district's average daily participation in the NSLP, meaning that larger districts with higher participation in school meals received more

funding. Table 3 shows the total food purchases of districts including purchases of all local foods and local produce during baseline and the intervention. During baseline, total average food expenditures for procurement grant districts were approximately

Table 2. Number of Participating Districts and Children in Oregon (Baseline 2014–2015 versus Intervention 2015–2016)

District Characteristics	Program		Percentage Change from Competitive to Opt-In
	Competitive (2014–2015)	Opt-In (2015–2016)	
Grantee Districts (<i>n</i>)	10% (22)	59% (124)	464% (102)
Students (<i>n</i>) ^a	41% (232,771)	88% (508,092)	118% (275,321)
Nonwhite Students (<i>n</i>) ^b	46% (95,131)	89% (186,766)	96% (91,635)
Students Eligible for Free and Reduced-Price Meals (<i>n</i>) ^c	39% (112,641)	89% (250,800)	123% (138,159)
Average Daily Participation in the NSLP (<i>n</i>) ^d	35% (104,063)	78% (235,309)	126% (131,246)

NSLP = National School Lunch Program.

^a 2015–2016 data are from ODE (n.d.).

^b Race/ethnicity data are from ODE (2019c).

^c Free and reduced-price lunch data are from ODE (2019b).

^d Average daily participation data are from USDA, Food and Nutrition Service (2019, October 4).

Table 3. Local Food Purchases for 2014–2015 and 2015–2016 for Opt-In Districts

	Mean Expenditures SY 2014–2015 (US\$)	Percentage of Mean Total Food Expenditures SY 2014–2015 (%)	Mean Expenditures SY 2015–2016 (US\$)	Percentage of Mean Total Food Expenditures SY 2015–2016 (%)	<i>p</i> -value
All Opt-In Districts (<i>N</i> = 121)					
Total Food Expenditures	650,141		655,269		.743
All Local Food Purchases	115,178	17.72%	121,381	18.52%	.264
Local Fruit and Vegetable Purchases	12,867	1.98%	15,281	2.33%	.154
High-Income Opt-In (<i>N</i> = 23)					
Total Food Expenditures	982,985		940,007		.277
All Local Food Purchases	208,413	21.20%	187,853	19.98%	.171
Local Fruit and Vegetable Purchases	30,258	3.08%	25,454	2.71%	.259
Low-Income Opt-In (<i>N</i> = 98)					
Total Food Expenditures	572,025		588,442		.334
All Local Food Purchases	93,296	16.31%	105,780	17.98%	.033
Local Fruit and Vegetable Purchases	8,785	1.54%	12,893	2.19%	.025

Notes: Low-income district was defined as 40% of children in the district qualify for free and reduced-price meals. Districts were included in the analysis if they provided both baseline and progress report data. We used a paired two-sample *t*-test to determine whether the average purchases of local products (all local products and specifically local produce) were higher in 2015–2016 than in 2014–2015.

US\$650,000, with high-income districts averaging US\$983,000 compared with US\$572,000 for low-income districts. Overall, during the baseline year, opt-in districts spent 17.7% of their food expenditures on local foods at baseline or approximately US\$115,000 per district, with nearly 2% of budgets spent explicitly on local produce.

During the intervention year, opt-in districts spent 18.5% of their budgets on local food purchases, which was an increase from baseline. The increase was driven by low-income grantee districts increasing their average local purchases (17.98% of total food expenditures), particularly local fruit and vegetable purchases (2.19% of total food expenditures; 12.19% of all local expenditures) by a statistically significant amount as can be seen in Table 3. These *p*-values can be interpreted as evidence of a difference in all local food purchases and, specifically, local produce purchases between the baseline and intervention years among low-income districts. No such difference was found among higher-income districts. However, it is important to note that the increase in total purchases is the amount of their grant funding. Technically, districts could use the grant funding in place of the funds they had previously used to purchase local products rather than make additional purchases, although this practice was discouraged.¹ While average purchases of local products, including fruits and vegetables, decreased for high-income districts, Table 3 shows that this decrease was not statistically significant. Purchases of local products decreased probably because these districts received higher amounts of grant funding under the competitive program compared with the opt-in program.

In addition to purchasing local foods, some districts supplemented grant funds with school garden produce. Thirty-seven percent of opt-in districts incorporated school garden produce into cafeteria meals at one or more schools within their district, and 78% of these districts were low income. Furthermore, smaller districts (fewer than five schools in the district) incorporated school garden produce in their cafeteria meals more than larger districts.

Conclusions and Discussion

Limited studies have examined specific policies that encourage districts to engage in farm-to-school activities. Such evaluations are complex, given the interconnectedness of the NSLP, farm-to-school, and other state programming focused on nutrition and child health. Thus, it is difficult to disentangle the impacts resulting from any one particular policy.

Evaluating state policy and implementation changes such as those that took place in Oregon from 2014 to 2016 can help guide the development of more robust and effective state and local farm-to-school policies in Oregon and elsewhere. This limited study examined the effects of Oregon's farm-to-school policy on low-income school districts related to the reach of the grant program and the purchase of local foods, specifically fruits and vegetables. Our findings, which are mainly descriptive, indicate that the policy, with its increased funding for school districts, increased the reach of the grant program for nonwhite students and low-income districts through its opt-in process. Specifically, the number of nonwhite students attending a district participating in farm-to-school nearly doubled. Further, 81% of participating districts were low income, which is much higher than the percentage of districts characterized as low income (65%) statewide. Additionally, under the opt-in program, 89% of children eligible for free and reduced-price meals attended schools in participating districts compared with 39% of eligible children under the competitive program. These facts demonstrate that the opt-in policy has been successful at reducing the barriers for low-income districts and children to participate in farm-to-school.

Furthermore, the policy increased the average total local food purchases for low-income districts, particularly fruits and vegetables. However, the findings also indicate that high-income districts, as a group, decreased their total purchases of local products with the opt-in grant program. As noted earlier, this may be because a higher proportion of the high-income school districts participated in the competitive grant program the year before and re-

¹ The 2017 legislation was revised to specify that grant funds should not be used to supplant existing purchases of Oregon foods.

ceived a larger amount of grant funding that year, meaning that their funding actually decreased during the opt-in program for local food purchases.


Additionally, the preliminary research suggests that larger school districts face barriers incorporating school garden produce into school lunches. This could be occurring for two reasons, both of which we heard during interviews with school foodservice directors. First, given the number of students they serve, smaller districts can use the limited school garden produce across all of the schools in their district, while the volume of produce needed by larger districts is more sizeable with gardens unlikely to meet the demand for all schools. Therefore, the larger districts choose to use the garden produce for taste tests or educational purposes. Second, larger school districts may have contracts with produce distributors or foodservice management companies, making it more difficult to change cafeteria offerings.

Because of the opt-in nature of the legislation, a control group was not possible, which is a limitation to this study. A control group would have served as a stronger baseline to compare the districts and assess the effect of the grant funding while minimizing the effect of all other variables. These data would have been available if a policy analysis or evaluation had been supported during the pilot or competitive program. A second limitation is that generalizations from Oregon's farm-to-school legislation cannot be made because of unique program attributes (providing US\$4.5 million in state funds, 80% of the funding set aside for local procurement and available to all districts on an opt-in basis, while 20% of the funding allocated to education grants through a competitive process). Nevertheless, this evaluation does offer useful insights into policy design and implementation for other states that are considering farm-to-school policies. As described above, the opt-in approach to the grant program facilitated greater participation from low-income districts that may not have accessed the grant program otherwise. Research on other states using an opt-in approach for grant programs aimed at reaching low-income school districts (for farm-to-school or any other intervention) can provide insights into the efficacy of this approach for reaching low-income districts or other

target audiences. Further, Oregon's policy approach of designating funds for procurement and/or education grants (versus generic farm-to-school grants to be used at the discretion of the district) enabled the prioritization of these activities in grantee districts. Research on the impact of similar policies or grant programs that target the use of funds to specific activities within a broader farm-to-school approach can corroborate the efficacy of these policy design elements and findings from this study.

Legislation that progresses over time, like the iterations of Oregon's farm-to-school procurement policy (and associated education grant program), is a strategy for moving farm-to-school activities from a pilot to an institutionalized format within the school system. The initial grant funding (competitive or opt-in) can jumpstart the adoption of farm-to-school activities especially in low-income districts, by providing the opportunity for school administration to witness the benefits of farm-to-school. As with any grants or external funding provided to schools, the hope is that the demonstrated benefit in itself is a compelling argument for self-sustaining the activities without grant funding (competitive or opt-in) in the future. Future studies conducting a multiyear follow-up on the grantee districts could provide valuable insights into the sustainability of activities seeded by grant funding, as well as the ability of districts to leverage other funds to supplement funds enabled through state policy. These findings, in turn, could be incorporated into future policy and grant program design. For example, if the longitudinal data demonstrate that a majority of school districts needed at least three years of grant funding to signal elements of self-sustainability, then the grant program could be structured to provide funds to a district for three consecutive years with requirements for demonstrating sustainability and leveraging other funds.

Additional research can help develop a more thorough understanding of the long-term impacts of Oregon's farm-to-school policy on children's health outcomes and on other intended outcomes on farmers and the local economy. Future research could assess the impacts of the grant program on children's eating behaviors, particularly in low-

income districts; farmer incomes, market expansion, and viability; and economic and employment multipliers for the state. Future research could also consider comparing policy models and impacts across states implementing farm-to-school policies to provide insight into impactful approaches and best practices to guide the field. 

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Small and minority farmers' knowledge and resource sharing networks, and farm sales: Findings from communities in Tennessee, Maryland, and Delaware

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Abstract

A network analysis can quantify the depth and breadth of a farmer's relationships with other local farmers, buyers and sellers, or other groups and

organizations. Such an analysis can potentially also reveal farmers' incentives, situations, and behaviors, and it may explain their economic success more generally. This study examines small and minority farmers' networks using a primary survey

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in three farming communities. We emphasize networks related to production, marketing, and resource-sharing activities of 127 farmers (nodes) in Tennessee, 46 in Maryland, and 23 in Delaware, and compute three different measures of network importance or “centrality” for each farmer. We then use generalized least squares analysis relating farmer’s age, gender, race, educational attainment, labor use on the farm, and farm location to the farmer’s centrality position or importance in the network, defined by number and strength of links or connections. In additional regression analyses, we find significantly positive effects of the centrality position on farm sales of specialty crops: our model predicts that a farmer who adds one additional link or connection can expect a 19% to 25% increase in sales, all else equal. Our results can potentially be used not only to disseminate information more efficiently, but also to identify farmers who would benefit the most from more targeted extension services.

Keywords

Farmer Networks, Minority Farmers, Centrality, Small Farmers, Network Analysis, Farm Financial Performance, Specialty Crops, Knowledge Sharing

Introduction

Knowledge about new agricultural practices and technology is often diffused through human interactions, whereby network structures as well as informant characteristics are critical. This is especially important for small and minority-owned rural farms: to compete with larger farms, such operations require access not only to new production and technology resources on the input side, but also to market outlets, including niche opportunities (Khanal & Mishra, 2014; Pratiwi & Suzuki, 2017). Information sources available to farmers include formal (e.g., university- or government-based Cooperative Extension) and informal social networks (Boahene, Snijders, & Folmer, 1999; Conley & Udry 2010; Lyon, 2000), as well as interpersonal relationships with peers, among others (Pratiwi & Suzuki, 2017).

The theory of social networks examines how nodes—consisting of individuals, firms, and organizations—interact with one another, where interac-

tions are represented as links (McClure, Frierson, Hall, & Ostlund, 2017). The literature on innovation and information diffusion is based on “social learning,” and includes studies of cultural evolution and social capital development (e.g., Hoffman, Lubell, & Hillis, 2015; Shaw, Lubell, & Ohmart, 2011). Innovation diffusion is often a byproduct of the actual adoption of technology, which can be enhanced if it occurs in an environment with strong social networks. In addition, culture evolves through social network-based exchanges as individuals copy and adopt ideas or suggestions made by individuals who are perceived as leaders (Richerson & Boyd, 2005). The *trust* that is represented by social capital may be most valuable when it is used to address local problems involving the provision of public goods (Coleman, 1990; Flora & Flora, 2008; Rupasingha & Goetz, 2007). The strength of trust-based relationships is immensely important for cooperation among specific groups, such as disadvantaged and minority farmer groups (Beratan, Jackson, & Godette, 2014). Individual and community cooperation and interactions among farmers and between groups can help build their capacity in new entrepreneurial opportunities (Beratan et al., 2014) and local agri-food systems (Dunning et al., 2012). It can also mitigate problems such as food insecurity in urban agriculture settings (Meenar & Hoover, 2012).

Social network analysis (SNA) is now widely used in diverse contexts to understand relationships among individuals and groups, including farmers embedded within supply chains. The latter are known as nodes, or hubs, and their connections are defined as edges, or links. Many different network measures can be calculated, but density and inter-node or intra-network distance are among the most common, allowing comparisons of networks with others as well as over time (Han & Goetz, 2019). Applications of SNA range from trade and agriculture (Kim & Shin, 2002) to biodiversity (Hauck, Schmidt, & Werner, 2016), forestry (Keskitalo, Baird, Laszlo Ambjörnsson, & Plummer, 2014), and regional food system analysis (Christensen & O’Sullivan, 2015).

At the same time, SNA has not been used widely to assess the performance of individual farms, especially in the context of small, minority-

operated farms in the US. Our study addresses this limitation by examining how small and minority farmers' participation and position within social networks affects farm performance. First, using primary data, we assess small farmers' production-, marketing-, and information-sharing networks and each farmer's network position and centrality. Second, we analyze the roles that network position plays in farm performance in terms of specialty crop sales. We use primary survey data of small (-scale) farmers in Tennessee, Maryland, and Delaware to empirically address these questions.

Method

Network Concepts

Social networks and relations are commonly represented as graphs showing nodes and links, which are referred to as social network analysis (SNA) maps. In directed networks, each link has an origin and a destination. Node centrality is an important concept in network studies and can be measured in terms of the degree, closeness, or betweenness score of the node, which in our case is a farmer (Freeman, 1978; Opsahl, Agneessens, & Skyoretz, 2010; Prell, Hubacek, & Reed, 2009). Another feature is that of symmetry: if A knows B, B should also know A. However, if A seeks information from B but not vice versa, then the resulting link is not symmetric.

The number of ties a node has with other nodes is known as degree centrality. For directed links, two types are calculated: (a) degrees-in centrality: the number of incoming connections or links to the node, and (b) degree-out centrality: the number of connections a node has to others, or the count of out-going links. A higher in-degree centrality suggests greater popularity or "prestige" of the node, which may be helpful for rapidly spreading new information to others (Prell et al., 2009). A higher out-degree is usually associated with greater sociability or "gregariousness."

Closeness centrality measures the extent to which an individual is "near" all other individuals in the network (Opsahl et al., 2010). In the case of a directed link, closeness centrality again includes a) closeness-in: which is based on the average length

of the path to the node, which affects how quickly information or goods can be received from other from nodes, and b) closeness-out: which is analogous, but on the outflow side. A node with a high out-closeness value can diffuse new information without needing many other nodes or intermediaries in the transmission (Opsahl et al., 2010).

Betweenness centrality measures the frequency with which a node lies on the immediate path between other nodes (Opsahl et al., 2010; Prell et al., 2009). It reflects the relative importance of a node in serving as an "intermediary" (or bridge) between other nodes. This measure is important and distinctive in that it also reflects the ability of a node to control information diffusion or flow within the network. Individuals with high betweenness scores tend to have a high degree of control; they can enhance or restrict information flows and also control who sees or is informed of a particular item. In this paper, we assess small farmers' networks by computing degree-, closeness-, and betweenness-centralities of each farmer, because each measure subtly captures a different quality of importance within the network.

Modeling the Factors Influencing Network Positions

Consider farmer i who has centrality position k , defined as P_i^k in network Z where $k = \{\text{degree in, degree out, closeness in, closeness out, betweenness}\}$. We are interested in how vector X_i of demographic and socio-economic exogenous factors influence the centrality position of farmer i :

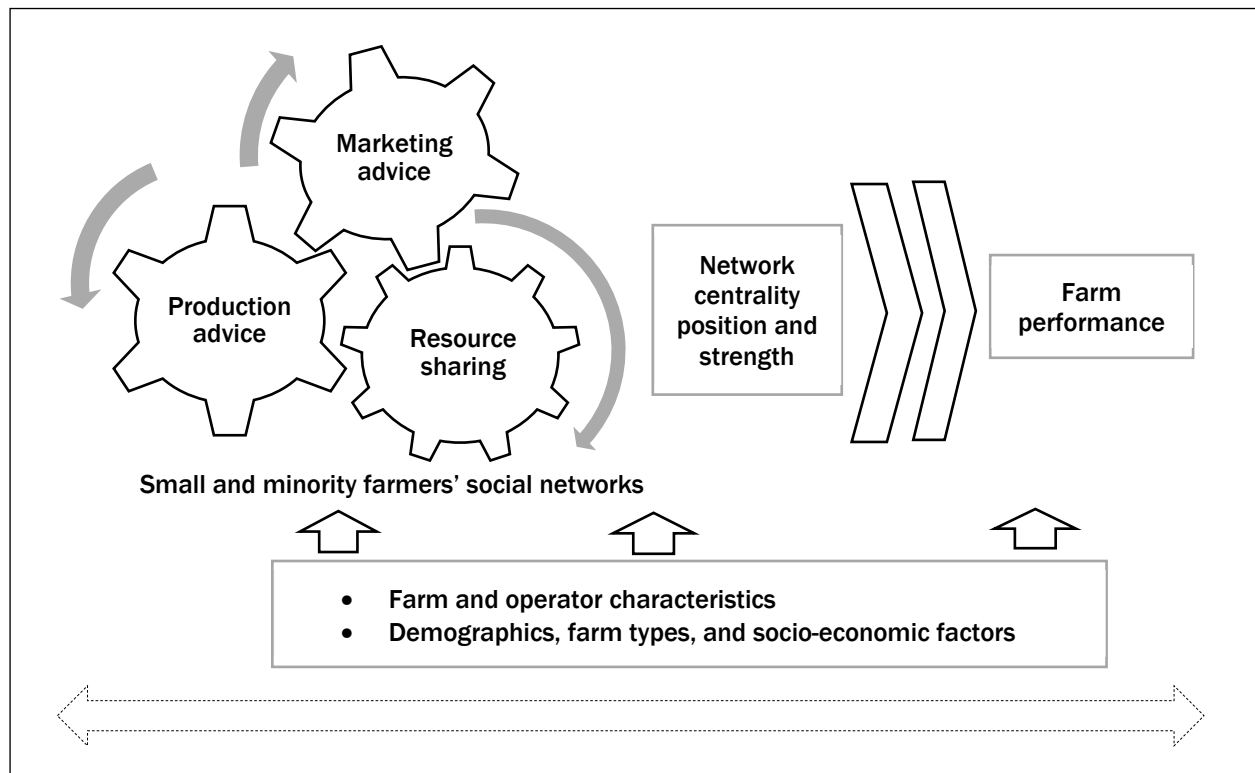
$$P_i^k = f(X_i) \quad (1)$$

We include respondent (farmer) age, education, ethnicity, and internet access as possible determinants of network centrality position.

Modeling Network Influence on Farm Performance

This section discusses the empirical method used to analyze and test hypotheses on the relationship between centrality positions and farm performance. An individual farmer i 's farm performance (e.g., farm sales) can be represented as a function of several demographic, socio-economic, and managerial characteristics, including the network ability:

Figure 1. Conceptual Framework Showing Relationship of Small and Minority Farmers' Social Networks and Farm Performance



$$S_i = f(X_i, P_i^k) \quad (2)$$

Here S_i represents farm performance of farmer i and X_i and P_i^k are as defined previously. We use OLS to examine this relationship statistically.

Figure 1 shows the overall conceptual theme of the paper. Small and minority farmers potentially utilize networks in production, marketing, and resource sharing where within- and between-network interactions and associated network strength and centrality position, along with demographics, farm, and farmer characteristics, significantly influence the farm performance (Figure 1).

Data

In this study, information was collected from small and minority farmers in three states: Tennessee, Delaware, and Maryland, as per the objectives of the project funded by the U.S. Department of Ag-

riculture, National Institute of Food and Agriculture (USDA NIFA). Surveys of farmers were conducted in 2012–2013 through Tennessee State University, University of Maryland–Eastern Shore, and Delaware State University. The study focused on small farms and producers growing and selling specialty crops. Employing different means of survey administration, follow-up, and reminders among small farmers, we identified 127 total nodes in Tennessee, 46 in Maryland, and 23 in Delaware networked for production advice, marketing advice, and resource sharing. These nodes were used for network graphing and calculating centrality scores. For the econometric analysis and model estimation requiring demographic and socio-economic information of each farmer, 117 observations with complete information were used. The steps in data collection are described in the following subsections. These steps are also described in the training manual published as a project output.¹

¹ <https://aece.psu.edu/nercrd/publications/rdp/network-analysis-of-farmer-groups>

Identifying Network and Sample Design

A first step in carrying out a network analysis is identifying the group of farmers and others who should be included. We sought help from established Cooperative Extension program representatives in each state who have direct, day-to-day connections with farmers during various activities of land-grant universities.

In Tennessee, the network covered six counties (Davidson, Montgomery, Rutherford, Shelby, Hardeman, and Franklin), three of which are adjacent to metro areas. Each county provided a list of pre-identified producers. These farmers were identified from lists maintained by county Extension offices. The pre-identified list included small vegetable farmers (we excluded large commodity producers from the study). We also excluded those potential respondents who reside in the same household and work on the same farm. The farmers were given space on the survey instrument to add other farmers not in the list; duplicated names were dropped. This survey of producers generated demographic and economic information of the operators such as age, experience, education, gender, ethnicity, and farming plans, as well as information on their farm production and sales. All counties had adequate numbers of farmers who provided useful network information.

In Delaware and Maryland, we used a number of criteria to identify and select samples for the network identification and analysis. In Delaware, we used the master list of producers maintained in the University's Cooperative Extension program. Large-scale producers were again excluded from the survey, for the most part. Even though the state university is open to providing technical assistance to large producers, considerable time was spent expanding opportunities for limited, small, and minority producers in the state and ensuring that producers from all counties in the state were represented. One additional selection criterion was to identify producers with specialty crops and the potential to market fresh agricultural produce and value-added products in neighboring metropolitan areas. In Maryland, we also examined the agroecological zone of the state and chose areas known for growing high-value crops. Farmers were reached by phone using a database of commercial small

farmers and ranchers maintained by the university. Some farmers were contacted at the small farm conferences and meetings organized by the university. Farmers selected were a mix of landowners and leaseholders growing a variety of products ranging from high-value vegetables (e.g., hot peppers, eggplants, okra, amaranth) to cut flowers and mushrooms, and garden-raised eggs. We used a list of small-scale farmers, which included socially disadvantaged farmers and detected two subnetworks within the overall network in Maryland.

Survey Questionnaire Design and Administration

Once the list of farmers was compiled, we developed and administered a survey for the network analysis. The survey questionnaire consisted of different components. If the population to be surveyed (the list identified) was not too large, survey respondents were asked to fill out the table or matrix that listed farmers across the top as well as down the rows. If the list was very long, farmers were asked to write down (across columns, with one per farmer) with whom they have a network relationship. Farmers were also asked about the nature of their network relationships, such as advice and resource exchange, if any, with the other farmers in the network. They were also provided space allowing them to add other individuals who were not listed. A second component of the questionnaire asked about network relationships. From the list of farmers (or the completed list after the respondent added names), each respondent was asked to enter the number corresponding to the other farmer with whom a relationship exists. To find the nature of the relationship, the following questions were asked: *Among these farmers, which one would you go to, to get information about a production problem? Who do you go to for a marketing problem? Who do you ask for advice on how to apply for credit or file taxes? Who do you ask for advice on agriculturally related information?* The third component of the questionnaire asked about production and sales, incomes, and demographic characteristics of farm operators.

Different strategies were used to obtain a high response rate from farmers. In Delaware and Maryland, strategies included mailing surveys and repeatedly following up; administering surveys at the farmer meetings, field days, and extension events;

and direct visits to farmers for one-on-one meetings after events. In Tennessee, the survey was conducted face-to-face among identified small fruit and vegetable growers in five counties. The venue for the survey in all cases was the county Extension office; county Extension educator assistance was instrumental in conducting the survey.

Results and Discussion

We present summary statistics of the variables in Table 1. As noted, our network analysis results are based on the responses of 117 individual small-scale, minority farmers—56% from Tennessee, 26% from Maryland, and 19% from Delaware (Table 1). Table 1 also shows degree-in, degree-out,

Table 1. Summary Statistics of the Variables Used in this Study

Variable	Definition	Mean	Stand. Dev.
<i>Network centrality measures</i>			
Degree-in	The number of connections directed to the node (number)	1.094	1.687
Degree-out	The number of connections the node directs to other (number)	1.846	2.176
Closeness-in	Inverse of total shortest path length directed to the node	0.010	0.015
Closeness-out	Inverse of total shortest path length the node directs to others	0.018	0.020
Betweenness	The number of times the node lies between the shortest path of two other nodes (controllability of information flow)	5.012	14.304
<i>Farm performance measures</i>			
Farm Sales	Total annual specialty crop sales from farm (in US dollars)	\$15,508	\$22,973
<i>Characteristics of farmer/ farm operator</i>			
Agebelow35	=1 if farmer/operator is equal or below to 35 years old	10.26%	
Age36to54	=1 if farmer/operator is between to 35 to 34 years old	31.62%	
Age55to64	=1 if farmer/operator is between to 35 to 64 years old	25.64%	
Ageabove65	=1 if farmer/operator is equal to above 65 years old	32.48%	
Gender: Female	=1 if farmer/operator is female	28.21%	
Race: White	=1 if farmer/operator considers his(her) race as White	39.32%	
African American/African	=1 if farmer/operator considers his(her) race as African American or African	44.44%	
Hispanic/Latino	=1 if farmer/operator considers his(her) race as Hispanic/Latino	2.56%	
Asian	=1 if farmer/operator considers his(her) race as Asian	11.11%	
Multiracial	=1 if farmer/operator considers his(her) race as multiracial	2.56%	
< High School	=1 if education level of farmer/operator is below high school	8.55%	
High School	=1 if education level of farmer/operator is high school	25.64%	
Some College	=1 if farmer/operator has some college level education	23.08%	
4-yr Undergrad	=1 if farmer/operator has 4-year undergraduate level education	28.21%	
Grad and above	=1 if farmer/operator has graduate or higher level education	14.53%	
Married	=1 if farmer/operator is married	71.05%	
Fulltime farming	=1 if farmer/operator considers him (her) as full-time farmer	56.41%	
Family labor use	=1 if farm operation uses family labor for farm activities	82.05%	
Hired labor use	=1 if farm operation uses hired labor	37.61%	
Internet access	=1 if farmer has Internet access	76.92%	
Years farming	Number of years the farmer/operator is in farming	27.05	20.79
Delaware State	=1 if farm is located in Delaware state	18.80%	
Maryland State	=1 if farm is located in Maryland state	25.64%	
Tennessee State	=1 if farm is located in Tennessee state	55.56%	
Number of observations		117	

Source: Primary survey of small farmers, by authors, 2012–2013.

closeness-in, closeness-out, and betweenness centrality as network measures. The average farmer has one incoming link (1.09 degree-in) and two outgoing links (1.85 degree-out). This indicates that at least one other farmer is connected to each farmer who, on average, connects to two other farmers in this nonsymmetrical network. Also, a relatively higher betweenness centrality (average score of 5.01 in our sample) reveals that each farmer lies between the network (or information) flow paths of 5 other farmers—which indicates that each small farmer can control information flow among the other farmers in the network; this score also has a relatively high standard deviation (14.3).

Other descriptive sample statistics show characteristics of the farmers in our sample and of their farms. On average, farms generated around US\$15,500 in annual sales from specialty crops, confirming that the sample includes a high percentage of very small farmers. Around 32% of sampled farmers were above 65 years of age, 32% were between 36 to 54 years; in terms of race/ethnicity, 44% were African American, followed by 39% White and 11% Asian. Regarding education level, 28% of sampled farmers had a 4-year undergraduate degree, and 26%, 23%, and 15% had a high school degree, some college, and graduate-level de-

grees, respectively. Around 56% of the sampled farmers were farming full time, 82% involved family members as labor, while 37% also hired labor onto the farm; most (71%) were married and had internet access (77%) for use in different farm-related activities (Table 1).

Table 2 shows descriptive information specific to the network by state. In the entire network, 86 out of 127 (around 68%) of the farmers in Tennessee, 19 of the 23 nodes (82.6%) in Delaware and 29 of 46 nodes (63%) in Maryland had at least one connection whether it was in terms of production, marketing advice, or sharing resources. Sharing of resources was more common in Delaware (82.6%, 19 out of 23 total possible connections) than in the other two states, with 43.5% and 44.9% respectively in Maryland and Tennessee. Using a network for marketing advice was more or less similar in all three states (56.5%, 52.2%, and 48.8% in Delaware, Maryland, and Tennessee, respectively). As shown by the degree centrality networks, farmers in Delaware were most densely connected, followed by those in Tennessee, and Maryland. This may reflect the result that there are fewer farmers in the Delaware farming community and, therefore, they may live relatively close to one another and, as a result, know each other better than is the case in the other two states.

Table 2. Summary of Network Connection Types and Network Centrality Among Small Farmers

State	connection type	total nodes	connected nodes	degree	closeness-in	closeness-out	betweenness
Delaware	entire		19	2.65	0.1999	0.2014	5.83
	production advice	23	18	1.57	0.1307	0.1319	5.57
	marketing advice		13	1.13	0.0647	0.0640	2.52
	sharing resources		19	2.52	0.1880	0.1868	5.39
Maryland	entire		29	0.76	0.0238	0.0242	1.02
	production advice	46	24	0.67	0.0211	0.0211	0.93
	marketing advice		24	0.67	0.0211	0.0211	0.93
	sharing resources		20	0.30	0.0076	0.0079	0.09
Tennessee	entire		86	1.02	0.0128	0.0130	4.02
	production advice	127	72	0.70	0.0074	0.0076	1.35
	marketing advice		62	0.53	0.0049	0.0049	0.42
	sharing resources		57	0.59	0.0069	0.0070	1.80

Source: Computation based on primary survey of small farmers, 2012–2013.

Networking for resource sharing is most dense in Delaware (possibly because of smaller individual farm size and the reason mentioned previously), while networking for production and marketing advice is densest in Maryland, and networking for production advice is more densely connected in Tennessee networks. In Maryland, the Extension educator may be helping farmers to access ethnic communities along the densely settled eastern seaboard (e.g., Washington, D.C.), which may account for this result. Sharing of resources had the lowest density in Maryland, perhaps because farmers there are better off and can afford to purchase their own resources.

Closeness and betweenness measures further explain patterns in the degrees, and these measures are related to some extent. In and out closeness for the 'entire' measure is larger in Maryland than in Tennessee, though the degree is higher in Tennessee. Therefore, the average density of connections indicated by degrees is higher in Tennessee than Maryland, but closeness is lower. It is interesting to look at the betweenness measure for 'entire': Tennessee has a higher value than Maryland, which indicates that farmers in Tennessee are more likely to be positioned between the connections of other nodes, which reduces the closeness measure. Moreover, the betweenness score is highest in Delaware, followed by Tennessee and Maryland. In Delaware, the betweenness score for production advice (5.57) is higher than that for sharing resources (5.39), even though the opposite is true for the average degrees (1.57 vs. 2.52). This indicates that individuals more often lie between the connections of other nodes in terms of production advice than sharing of resources. This also explains the lower closeness score in production advice than in sharing resources.

Factors Influencing Network Centrality Positions

Table 3 shows our regression estimation results for the factors influencing a farmer's network centrality position. We used a negative binomial regression fitted using a maximum likelihood estimator. This is appropriate for the count nature of the dependent variable given that our degree measures are non-negative counts. The bottom rows of the table show overall model statistics. A significant

dispersion parameter (α) suggests a higher suitability and fit of the negative binomial compared to other count data models (specifically, the Poisson model) in our case. Additionally, a pseudo- R^2 of 0.14 and 0.13 suggests a reasonably good fit of our non-linear models (considering the small sample size).

Our estimated coefficients suggest that factors such as farmer's age, gender, race, educational attainment, labor use on the farm, and farm location significantly affect the farmer's centrality position (measured by degree-in and degree-out) in the networks. Results in Table 3 suggest that the farmer's age is positively associated with centrality position; specifically, farmers 65 years and older are more likely to have higher degree-in centrality, while those 55 to 65 years are more likely to have higher degree-out centrality as compared to relatively younger farmers (base: less than 35 years). This suggests that other farmers connect to relatively older and experienced farmers to seek their advice, perhaps valuing their experience. A gender effect is shown in degree-out equations suggesting that female-owned or -operated farms have lower degree-out centrality—indicating that these farms are likely to connect to fewer other farmers compared to male-owned or -operated farms. This result is somewhat unexpected. However, this may reflect the characteristics of this particular population, where female farmers are less outgoing. The data collected on race suggests that African American farmers are likely to be connected to a larger number of other farmers (in terms of both seeking advice and providing advice) as compared to White farmers, while Asian farmers are contacted by more other farmers, but do not necessarily reach out to others in the network for advice. Multiracial operators, on the other hand, are likely to be connected by fewer other farmers in the network, as compared to White farmers.

Table 3 also shows that educational attainment has a positive impact on degree-in centrality and a negative impact on degree-out centrality. Specifically, farmers with graduate-level education or above are likely to have higher degree-in (more people connect to them) as compared to those with less than a high school education. Negative coefficients on the higher education variables of

Table 3. Factors Influencing Network Centrality Position

Variable	Degree-in		Degree-out	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-1.931	1.143	0.914	0.777
<i>Age (Base: less than or equal to 35 years)</i>				
Age36to54	0.089	0.567	0.059	0.252
Age55to64	0.964	0.748	1.028***	0.399
Age65&above	0.615***	0.280	0.531	0.565
Married	0.342***	0.137	-0.147	0.186
Female	-0.124	0.216	-0.313*	0.173
<i>Race (base: White)</i>				
African American	1.357***	0.435	0.978***	0.217
Hispanic	0.0836	0.837	0.214	0.582
Asian	1.244***	0.631	0.144	0.402
Multiracial	-17.867***	0.911	0.685	0.858
<i>Education level (base: < high school)</i>				
High school	0.879*	0.504	-0.440	0.319
Some college	0.472	0.534	-0.692***	0.261
4-year undergrad degree	0.770	0.508	-1.062***	0.395
Graduate education and above	1.205***	0.621	-0.925***	0.416
Full time farmer	-0.025	0.392	-0.294	0.301
Family labor use	0.100	0.337	-0.065	0.161
Hired labor use	0.473***	0.170	0.257	0.218
Internet access	-0.509	0.444	0.109	0.183
<i>Location (Base: Delaware state)</i>				
Maryland	-1.151***	0.544	-0.516***	0.229
Tennessee	-0.336	0.394	-0.139	0.283
Dispersion parameter (α)	0.560*	0.301	0.300*	0.159
Pseudo R ²		0.144		0.131
Number of observations		117		117

Parameters are estimated using negative binomial regressions appropriate for count data with dispersion; *, **, *** indicate 10%, 5%, and 1% level of significance, respectively.

some college, undergraduate, and graduate-level & above in the degree-out equation suggest that farmers with relatively higher education levels connect to fewer other farmers, as compared to those with less than high school education. Overall, this education effect is consistent with expectations: compared to the less than high school educated, farmers with a higher level of education are expected to be contacted by more other individuals for advice, but are less likely to seek advice from their peers in the network. Our results also suggest

that compared to Delaware farmers, Maryland farmers were significantly more likely to have lower degree-in and degree-out numbers.

The Impact of Network Centrality on Farm Sales

Table 4 presents our estimation results for the impact of network centralities on farm sales. Recall that farm sales are the annual total farm sales from specialty crops (in US dollars). We used a generalized linear poisson model suitable for our sales variable reported as non-negative integers.

Table 4. Equations Estimating the Effect of Network Centrality on Farm Sales

Variable	Model 1	Model 2	Model 3
	Parameter Estimate	Parameter Estimate	Parameter Estimate
Constant	10.676*** (0.421)	10.085*** (0.507)	10.736*** (0.408)
Degree-in centrality	0.189*** (0.063)		
Degree-out centrality		0.246*** (0.054)	
Betweenness centrality			0.034* (0.020)
Age (Base: less than or equal to 35 years)			
Age36to54	0.687** (0.303)	0.744** (0.318)	0.664** (0.298)
Age55to64	0.149 (0.199)	0.135 (0.283)	0.176 (0.227)
Age65&above	0.038 (0.187)	0.049 (0.223)	-0.083 (0.196)
Married	-0.724*** (0.168)	-0.742*** (0.175)	-0.593*** (0.142)
Female	-0.629*** (0.193)	-0.571*** (0.147)	-0.643*** (0.188)
Race (base: White)			
African American	-2.259*** (0.409)	-2.557*** (0.448)	-2.165*** (0.403)
Hispanic	-2.936*** (0.272)	-3.278 (0.271)	-3.125*** (0.285)
Asian	-0.818*** (0.286)	-0.573** (0.267)	-0.691*** (0.280)
Multiracial	-1.841*** (0.476)	-1.298*** (0.300)	-1.877*** (0.401)
Education level (base: less than high school)			
High school	0.561** (0.252)	1.018*** (0.242)	0.654*** (0.226)
Some college	0.760*** (0.319)	1.063*** (0.214)	0.743*** (0.291)
4-year undergrad degree	0.339 (0.473)	0.676 (0.430)	0.236 (0.473)
Graduate educ. and above	0.719** (0.364)	0.911*** (0.343)	0.719* (0.404)
Full time farmer	-0.987*** (0.293)	-0.834*** (0.233)	0.970*** (0.361)
Family labor use	0.757 (0.515)	0.961* (0.536)	0.808 (0.532)
Hired labor use	-0.427 (0.279)	-0.337 (0.226)	-0.419 (0.275)
Internet access	-0.277 (0.256)	-0.401* (0.221)	-0.376* (0.218)
Years of farming	-0.003 (0.004)	0.008* (0.005)	0.005 (0.005)
Location (Base: Delaware state)			
Maryland	-0.501*** (0.182)	0.509*** (0.114)	-0.437*** (0.129)
Tennessee	-0.689 (0.168)	-0.968 (0.201)	-0.818*** (0.185)
Log pseudolikelihood	-291783.74	-278424.75	-309149.50
AIC	7578.98	7231.99	8030.04

Standard errors are in parentheses; standard errors are robust standard errors adjusted for 8 clusters; Parameters are estimated using generalized linear models with family (poisson) & link (log); *, **, *** indicate 10%, 5%, and 1% level of significance, respectively.

Since centrality measures are correlated, we used five separate equations to estimate the effects of degree-in, degree-out, closeness-in, closeness-out, and betweenness, controlling for several other variables. Table 3 shows the results from three equations² representing separately estimated effects of degree-in, degree-out, and betweenness centralities. We found a positive and highly significant impact of each centrality measure on farm sales. Overall, our results confirm a significantly positive relationship of sales with involvement in the network. However, consistent with our expectations, the magnitude of impact is different as these centralities indicate the different ways of involvement and ability in the network—indicators of number of connections (degree centrality), proximity or distance of the actors in terms of information access (closeness centralities), and control of information flow (betweenness centrality).

A positive 0.188 coefficient of degree-in centrality suggests that expected farm sales increase with the number of farmers who know or connect to the farmer in question. A unit increase, essentially an additional farmer connection (link) to the node, is associated with an increase in farm sales of around 19%. The higher number of connections likely helps farmers to acquire knowledge and access new technologies and other innovations in farm-related news. This knowledge and information exchange and discussion with these connections may, in turn, help enhance farm sales. Similarly, a positive coefficient of degree-out centrality suggests that sales increase as a farmer connects to more other farmers. A coefficient of 0.246 indicates that a one-unit increase, essentially an additional farmer connection (out) from the node, increases farm sales by 24.6%. This also means that being more sociable within the overall network conveys a small advantage over merely being more popular, in terms of expanded sales. Therefore, how many other farmers connect to a farmer and how many other farmers a farmer connects to both play an important role, but the latter has an even higher magnitude of impact on sales.

Additionally, a significantly positive effect of betweenness centrality on farm sales suggests that sales volume increases as the farmer's power to control information flow increases. Interestingly, we found around 3.4% higher farm sales for each one-point increase in betweenness centrality. Essentially, betweenness centrality is the measure counting the number of times the farmer is between the path (flow) of other farmers. Thus, the positive effect suggests that the key farmers having a higher degree of ability to control the flow of information also generates higher sales.

Several other variables influence farm sales, which are included in the models (Table 4). The coefficient on age across all equations suggests that farmers aged 36 to 54 years have higher sales, as compared to farmers below age 35. We also found a significantly positive effect of education, as indicated by coefficients of high school, college, and graduate education variables, consistent across all equations. The positive effect of age and education is plausible as older and more educated farmers gather farm experience or knowledge over time, which helps in various ways to increase farm sales. We also found effects of gender and race on farm sales. Specifically, female-owned or -operated farms generate lower sales than those operated by males. Also, our results across all equations suggest that operators or farmers belonging to African American, Hispanic, Asian, or multiracial ethnicities/races generate lower farm sales, as compared to White counterparts.

The results also show that full time farmers have fewer farm sales when degree-in and degree-out are used as centrality measures: in these equations, full time farmers have lower sales than part time farmers. In contrast, the effect is positive when we use betweenness as a centrality measure. The reason for this is not completely transparent and requires further research. It is possible that full-time farmers grow more non-specialty crops, which were not considered in this particular study, but this does not explain why the sign on the coefficient flips in model 3 (this is the only variable for

² Although we also estimated equations representing the effect of closeness-in and closeness-out centralities, we have not presented these here due to space limitations. Moreover, we found the effect of closeness centralities to be significantly positive, consistent with other centrality measures.

which this happens). Somehow, for full-time farmers the fact of being “between” the connections of more other farmers enhances farm sales, compared to simply having more in- or out-connections alone. The effect of internet access also has results counter to expectation (and in contrast to the findings from Khanal, Mishra, and Koirala, 2015)—our results show significantly negative effects on farm sales, across all equations. If the internet is only used to engage in social media, rather than to seek information related to the farm business, such access could in fact reduce farm productivity and thus lower farm sales.

Summary and Conclusion

The extent of interaction, network structure, and type of agricultural informants are as crucial to information exchange, knowledge transfer, and technology diffusion in farming as they are in other industries. This is even more important for small farms, and especially those located in rural areas. SNA is a powerful tool that may guide social planning, outreach, and dissemination policy and help to answer important questions, such as how small farmers connect to each other, cluster with one another, and seek information, production, and marketing advice. This study conducted SNA of small farmers and analyzed factors influencing network participation and the impact of network positions on financial performance. We find several demographic and socio-economic factors influencing the network centrality of small farmers. Specifically, age, educational attainment, gender, farm hours and labor use, as well as location factors significantly influence network positions. Additionally, the farmer’s network position significantly affected their specialty crop sales, regardless of the network centrality measure used—higher centrality (more central, more connection, higher ability to control information) positively influences farm sales.

Our findings may be helpful for community development researchers, economists, and Extension educators in understanding farmer networking processes and structures, and in developing information delivery strategies that are sensitive to the network-specific attributes of each farmer. With SNA it is possible to reach many farmers and identify key contacts and key informants, especially in

minority and underserved communities, who otherwise may not have direct contact with mainstream Extension. Consistent with our expectation, networking is crucial for production-, marketing-, and resource-sharing aspects while magnitudes of impact differ by the centrality measure used. Different centrality positions indicate different aspects of involvement such as *being popular*, *having more connections*, *having control of information*, and *having the ability to quickly receive or pass information*. Farmers’ centrality positions within the different networks are influenced by several demographic factors. In addition, centrality positions still have independent effects on sales of specialty crops even after we control for key demographic factors, including educational attainment.

More generally, for Extension educators and practitioners, our study shows that SNA can serve to identify key individuals within a farming community (network) who can most effectively disseminate information because they are popular and have prestige or the trust of other community members. Likewise, SNA can help identify gregarious individuals who can quickly disseminate information because they are connected to many other individuals in the community. Of course, such knowledge needs to be used with caution, as it could be abused (e.g., to distribute false information). Of equal interest, an SNA can be used to identify farmers within a network who may require additional effort in targeting, because they are on the fringe of the network. For example, in our communities, females had fewer out-degrees than males while multiracial individuals had fewer in-degrees than Whites. Multiracial individuals also had fewer sales of specialty crops, holding the centrality measure constant, and suggesting that they may benefit from additional attention by Extension educators. Those who were not married also had fewer in-degrees, indicating they may not receive as much information from the network as their married peers. A similar analysis could be conducted for the betweenness and closeness scores, but this was beyond the scope of the current study.

Finally, we discuss a few limitations of our work. First, our econometric estimation is constrained by limited data from survey responses; having a larger sample size could yield more robust

inferences. Second, we caution readers that our findings should not be used to infer complete cause-and-effect relations and should instead be interpreted as directional associations and correlations under given assumptions. More rigorous investigations toward estimating causal inferences could be a topic for future research. The work pre-

sented in this paper suggests that further investments in research on farmers' social networks could have high payoffs. Moreover, it would be of great interest to compare the networks measured here with those derived from other farmers elsewhere in the U.S., who are not minorities or small-farm operators.

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Gaining ground: An exploration into the lives of Missouri's lesbian farmers

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Abstract

Formerly “invisible,” lesbian farmers have received increased attention recently, within both sociological scholarship and the popular media. Despite this attention, preconceptions about their lives persist. Assumptions of gay culture existing exclusively in metropolitan areas and of rural culture remaining organized by blood linkage and land ownership, combined with the continued predominance of men in agriculture, make this evolving realm of inquiry relevant to social scientists, agriculturalists, and extension professionals. In light of these intersections of identities and assumptions, and the remaining gaps in scholarship concerning this population, I conducted a case study, which was situated within a framework of ecogender studies. As such, the research focused on gendered relationships with nature and the emancipatory potential of women reclaiming their connections to

nature through agriculture. The experiences of this population provide transferable lessons about humans as food system participants and present opportunities for rural development through sustainable agriculture.

Keywords

Lesbian, Sustainable Agriculture, Ecofeminism, Ecogender Studies, Community Development, Queer Farmers, Food Systems

Introduction

An investigation into the lives of lesbian farmers in the United States, within Missouri specifically, engages with multifaceted notions of identity, culture, and geography. Missouri is a conservative state dominated by a conventional agriculture, and its resident lesbian farmers must navigate challenging economic, political, and social landscapes. While relevant academic disciplines, such as rural sociol-

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Disclosure

This research received IRB approval.

ogy or queer studies, are evolving, scholarship is often still characterized by assumptions into which lesbian farmers do not fit. Assumptions of gay culture existing exclusively in metropolitan areas and of rural culture remaining organized by blood linkage and land ownership (Bell & Valentine, 1995; Oswald & Culton, 2003), combined with the continued predominance of men in agriculture (U.S. Department of Agriculture [USDA], 2012), make it difficult to situate a study of lesbian farmers into a prescribed framework. Even as queer farmers gain modest attention in the media, gay men and lesbian women remain grouped together, although the experiences of gay men and lesbian women in agriculture often are vastly different (Kazyak, 2012). As Carolyn Sachs states, “Lesbians in rural places remain invisible to scholars, to other rural people, and to the urban gay and lesbian culture” (Sachs, 1996, p. 24). Though lesbian farmers’ experiences may overlap with those of other women-identifying farmers, assuming a universalism in experience among female farmers contributes to a further erasure of lesbian women. Sexuality has become an important part of the intersectionality discussion that was previously limited to race, class, and gender, and this research was intended to contribute to that conversation in the context of Missouri’s agriculture and food systems (Taylor, Hines, & Casey, 2010).

As the queer community continues to experience greater acceptance and acknowledgment on a national and regional scale, its members still encounter prejudice, especially in a conservative region like the rural Midwest. For example, the Missouri Farm Bureau (MFB), which claims to be the “state’s most effective organization working to improve the quality of life for farmers, rural Missouri, and all Missourians” (MFB, n.d., “What we’re all about,” para. 1), still included statements in their yearly policy handbook such as, “We are opposed to the legalization of gay marriages by either state or national legislation” and “We oppose the concept of a ‘Gay Bill of Rights’” (MFB, 2020, p. 91), years after *Obergefell v. Hodges* (2015) and the Supreme Court’s recognition of marriage equality. The bulk of this research preceded both the infamous Rush Limbaugh comments about lesbian farmers (Limbaugh, 2016) and the 2016 presiden-

tial election, and since then, the intersections of rural social dynamics, gender politics, and environmental and agricultural concerns have only become more tense and fraught with anxiety. Many are asking what the future of rural America will look like, who will be welcome, and how they will make a living there. This study endeavored to examine those questions from the standpoint of a particular population.

The main driving question behind this study was: What are the lived experiences of Missouri’s lesbian farmers? From this central issue question flowed additional subquestions related to how gender influences and engages with agricultural production, and how a rural, conservative setting constrains or shapes the lives of lesbian women. In this paper, I argue that it is sexuality and/or gender expression, and not just gender, that affects Missouri women’s experiences in agriculture. Additionally, I argue that research, sustainable agriculture advocacy, agricultural extension work, and rural development initiatives must attend to sexuality in intersection with gender. The women whose stories appear in this work have planted seeds of alternative ways to engage with agriculture and the environment, and they are forging a path for a sustainable agriculture through the monocultural corn and soy fields of Missouri.

Review of Literature

Most relevant literature stems from broader categories of sociological research in either rural queer studies or on women farmers. It is important to recognize the distinctions between these areas of literature, as, historically, rural queer studies work rarely differentiated between the needs or experiences of gay men and lesbian women, and women’s studies work rarely differentiated between straight and lesbian women. This review will lay a foundation for the study based upon feminist scholarship of food and agriculture, relevant concepts from rural queer studies literature, and a discussion of “landdykes,” female masculinity, and additional notions pertaining specifically to the lives of lesbian farmers.

In recent decades, scholars have applied feminist lenses to studies of agriculture and environmental sustainability and have examined how

various interpretations and demonstrations of masculinities can be seen in American agriculture (Ferrell, 2012; Peter, Bell, Jarganin, & Bauer, 2000). A popular example of the linkages between the technology-dependent, conventional agriculture of the United States and masculinity is the symbolism of the tractor (Barlett & Conger, 2004; Brandth, 1995). Tangibly, the ability to operate large machinery, like a tractor, requires skills often demarcated along gender lines. Even women who grew up on farms, and especially those with brothers or close male relatives, may not have been trained in tractor work. The tractor clearly separates men's labor on a farm from women's labor. Symbolically, the tractor represents the strength, efficiency, and dominance over nature expected of traditional male farmers.

Despite the gendered symbolism, both men and women may enact masculine or feminine approaches to agriculture (Peter et al., 2000). Sustainable agriculture, in its various forms, is often described as a more nurturing or feminine approach to agriculture, and without ascribing gendered essentialism to the work, women farmers are, for example, more likely to farm organically (Rising, 2013; USDA National Agricultural Statistics Service [USDA NASS], 2014b). Trauger (2004) has argued that while traditional models of agricultural production may prevent women from independently acquiring capital, alienate them from knowledge and support, and relegate them to the role of "farm wife," the sustainable agriculture movement has empowered women and created space for them to cultivate identities as farmers. The feminist agrifood systems theory (FAST) expands Trauger's argument further and articulates the following six themes pertaining to women farmers in sustainable agriculture (Sachs, Barbercheck, Brasier, Kiernan, & Terman, 2016, p. 2), asserting that women farmers:

1. create gender equality on farms amid broad societal changes in gender roles,
2. assert the identity of farmer,
3. access the resources they need to farm by pursuing innovative ways to access land, labor, and capital,
4. shape new food and farming systems by in-

tegrating economic, environmental, and social values,

5. negotiate their roles in agricultural organizations and institutions, and
6. form new networking organizations for women farmers.

Although FAST, and its supporting scholarship, mark a recognition of the formerly hidden lives of women farmers, it still falls short of encompassing a fully intersectional view of farmer identities and gives no attention to the lives of lesbian farmers. This is ironic given that Sachs first coined the term "invisible farmer" to describe the hidden contributions of women on farms (1983). While there has been an increase in women principal operators on United States farms in recent years, up to 14% between the 2007 and 2012 agricultural censuses (USDA National Agricultural Statistics Service [USDA NASS], 2014a), research has created a new iteration of invisible farmers in ignoring the experiences of lesbian farmers. This is an example of the heterosexism that persists within the sustainable agriculture movement (Leslie, 2017). While sustainable agriculture is often considered a more progressive and equitable space in the larger landscape of American agriculture, it is still bound by many heterosexist norms. Leslie described the persistence of the family farm as the primary business model in sustainable agriculture as an example of a heterosexist institution, and he discussed how queer farmers are often pressured to reproduce this model to remain viable. He argued for a broader "queering" of food systems that only considers agriculture sustainable when the diverse relationships and livelihoods of its actors are sustainable as well. Wypler (2019) built upon this call in her work examining lesbian and queer sustainable farmer networks in the Midwest. She argued that traditional, heteropatriarchal forms of farmer support do not align with queer farmers' agricultural practices or queer identities, and that queer farmers must build networks outside of these conventional avenues in order to be truly sustainable.

Because the literature on women farmers leaves the aforementioned heterosexist gaps, related literature on the identities of rural, nonfarmer, lesbian women helps construct a more complete

impression of the lives of lesbian farmers. The concept of rural gender presentation as “female masculinity” is one theme that emerges from the literature, as discussed extensively by Emily Kazyak (2012). She stated, “Masculine gender practices, from wearing flannel shirts to working in traditionally male-dominated jobs, are part of how the category ‘lesbian’ is constructed” (Kazyak, 2012, p. 824). She also addressed the notion that although traditional femininity in rural cultures is synonymous with heterosexuality, rural areas are not necessarily inclined to stigmatize female masculinity. Whereas a more masculine appearance may signify lesbian sexuality in urban environments, the lines between feminine and masculine in terms of dress and labor are often blurred in rural society, where straight women may also engage in farm work and dress accordingly. To Kazyak’s interpretation, this acceptance of a more masculine gender presentation among rural women may contribute to the creation of a more welcoming space for lesbian farmers in the rural Midwest. Importantly, this work provides an example of the distinct differences between gay men and lesbian women’s experiences in rural society, as “male femininity” is not nearly as well accepted (Fellows, 1998). Though these scholars certainly do not assert that all lesbians are “butch” or that all gay men are “femme,” their work speaks to a flexibility in rural gender presentation norms that may be advantageous for lesbian farmers. These diverse and fluid concepts of gender presentation, and how they challenge cultural norms in rural society, serve as a reminder of the value of examining distinct queer populations individually.

Kazyak (2011) also examined the geographic elements that contribute to the construction of rural queer identities. Although common cultural narratives paint the rural Midwest as a place where “gay and lesbian sexualities are unclaimed, stunted, or destroyed” (Kazyak, 2011, p. 561), she argued that rural gay and lesbian individuals actively modify cultural narratives to develop their own rural queer identities that are unlinked from, and often opposed to, those of urban queer communities. Individuals construct identities around “being known as a good person” and having long-standing ties in their rural communities (Kazyak, 2011, p. 571).

Kazyak discussed a seemingly counterintuitive trend of queer individuals fleeing from urban areas to rural areas as part of the process of coming out, while acknowledging the social isolation that still affects the lives of rural gay and lesbian residents. Her work contributes to the ongoing disentangling of queer culture from urban culture and presents processes of queer identity construction that are uniquely rural (Gray, Johnson, & Gilley, 2016).

Another main theme from the literature is that of lesbian community building in rural society. First, as Bell and Valentine (1995) explained, it is important to differentiate between queer individuals who are born in rural locations and those who choose to relocate to the country. Intentional decisions to locate to rural areas represent a form of rural queer identity construction, as outlined by Kazyak (2011), but also represent a privilege and an agency that may not exist for all rural-born queer individuals. The lesbian land movement in the U.S. is an example of this trend of rural relocation and dates back to the 1970s, during which numerous lesbians founded a network of women-only farms and developed a society free from men (Anahita, 2003). Members of this original movement were unified in their adherence to ecologically sustainable practices, self-sufficiency, and a belief in radical lesbian feminism, and endeavored to build resilient communities that aligned with those principles (Anahita, 2009). It is estimated that currently more than 200 of these communities, now known as “landdyke communities,” remain scattered throughout rural America (Anahita, 2003). A modern manifestation of the movement’s ideals can be seen, for example, in the work of the Lesbian Natural Resources organization (LNR, n.d.).

Lesbian farmers may be motivated to pursue agriculture for myriad reasons. As women, they may be drawn to sustainable agriculture as a space that is affirming of their identities as farmers (Sachs et al., 2016). Rural environments may be more inviting for women who construct an identity of female masculinity and hope to dress and behave accordingly (Kazyak, 2012). Across these bodies of literature, there are threads of autonomy, community-building, and a desire to work in concert with nature. It was the intention for this study to provide a snapshot of Missouri’s lesbian farmers that

continues to draw together the work that has been done on gender and agriculture and recent work on queerness in agriculture, and in doing so to examine the opportunities and implications for rural life, agriculture, and the environment.

Ecofeminist Roots and an Ecogender Studies Framework

Ecofeminist theories first emerged in the 1980s as an extension of both the environmental and women's movements (Salleh, 1984). In its earliest form, ecofeminism was simply the acknowledgment of the parallel and similar dominations of both women and nature by men. As the theory expanded and evolved over time, it influenced a wide array of environmental and feminist movements and corresponding scholarship (Warren, 1996). Although its myriad tenets continue to be redefined, at its core, ecofeminist theory asserts that human interactions with nature are inherently gendered and that the reclaiming of women's connections to nature has emancipatory potential for both women and nature.

Only in select instances has an ecofeminist lens been applied to agricultural contexts. The use of this highly critical framework has shed new light on the environmental and social issues within conventional agriculture and contributed an additional argument for sustainable agriculture (Sachs, 1992). Sachs asserted that agricultural social science must consider four levels of diversity, or lack thereof, in the agricultural system: biological, cultural, structural, and product. She encouraged scholars to attend to cultural diversity in their discussions of agricultural biodiversity and theorized connections between human diversity and agricultural sustainability and diversity. Given the philosophical underpinnings of this application of ecofeminist theory, as well as the claim (substantiated by literature) that women play key roles within the sustainable agriculture movement, ecofeminist thinking laid an initial theoretical foundation of this study (Gershuny, 1991; Jarosz, 2011).

Banerjee and Bell (2007) synthesized decades of debate surrounding ecofeminist social science and feminist political ecology into a single framework for social science research entitled "ecogender studies." While the authors provided a

clear structure for the framework's use by outlining tenets and methodological positions, which are addressed below, what makes the framework of ecogender studies particularly valuable is its acknowledgment of the issues of previous ecofeminist scholarship, such as romanticization of women's work.

Banerjee and Bell expanded the lines of ecofeminist inquiry by conceptualizing the diversity of experiences of both women and men, and recognizing that complete emancipation of women, or any other oppressed group, can only occur through the elimination of ideological and material domination of women, men, and the natural world. Ecogender studies acknowledges that relationships between men and women, between individuals and the larger society, and between humans and nature are unfathomably complex and deeply rooted in historical structures of oppression. The work of transformation of these relationships and emancipation of the involved parties cannot occur in isolation or in a state of ignorance of these historical contexts.

Finally, Banerjee and Bell outlined four central methodological principles that guided this study: locationality and reflexivity, dialogics and relationality, critical and interrogable, and multiple methods and triangulation. The structural impacts of these influences on the research methods will be explored further in the following sections, but Banerjee and Bell's work urged me to examine and triangulate my findings from as many directions as possible, to branch out into novel and experimental sources of data, and to explore the lives of Missouri's lesbian farmers in ways that fostered an emergent analysis that was critical, dialogic, and relational.

Research Methods

Qualitative Case Study

The research employed a qualitative case study design (Stake, 1995). Because case study research is framed around an understanding of the bounded system, case study researchers articulate inclusion criteria in terms of elements that fall within the boundaries and those that do not (Yin, 2003). All participants in this study were self-identified, cis-

gendered, lesbian women. All participants were farming full time at the time of the study as a farm employee, farm owner, and/or principal operator. Participants lived and farmed in Missouri at the time of the study. An understanding of the lived experiences of Missouri's lesbian farmers cannot be extrapolated to constitute an understanding of the lived experiences of lesbian or queer farmers nationally or globally, although transferable lessons exist. I acknowledge that while the tight bounds of the study excluded other queer women-identifying individuals, they may see their experiences reflected in the data as well. Additionally, I acknowledge that the labels we use to describe gender and sexuality are rapidly evolving, and the terms used in this paper reflect a particular moment in time and the preferences of a particular set of participants.

Missouri as Place

The context of the study, Missouri, shaped the phenomenon under scrutiny. Cultural geographer J. B. Jackson famously stated, "It is place, permanent position both in the social and topographical sense, that gives us our identity" (Jackson, 1984, p. 152). In both explicit and implicit ways, Missouri, as place, shaped the identity development of the research participants, as well as their livelihoods and community support systems. Additionally, in a case study inquiry, researchers acknowledge the inextricable connections between research phenomena and setting (Stake, 1995; Yin, 2003).

Missouri sits in the center of the continental United States, bordered to the east by the Mississippi River and bisected latitudinally by the Missouri River. As of the 2010 Census, 70% of Missouri's 6 million residents lived in urban areas, although roughly 97% of the land area of the state was classified as rural (U.S. Department of Commerce [USDC], 2012). At the time of this writing, Missouri ranked second among the 50 states in number of farms with 99,170; only 175 of those farms were certified organic. The state's top five agricultural commodities are soybeans, corn, cattle and calves, hogs, and broilers, although the diversity of terrain across the state supports regionally specific crops such as wine grapes and elderberries along the major rivers and rice in the "Bootheel" of the southeast corner (USDA, 2018). The major

engine of agricultural research is the land-grant institution, the University of Missouri, whose College of Agriculture, Food, and Natural Resources (CAFNR) manages more than 14,000 acres (5,700 hectares) of research plots across the state, and whose cooperative extension disseminates research findings to Missouri farmers (CAFNR, n.d.). Specialty crop and small-scale agricultural research and extension are primarily handled by Lincoln University, the 1890, historically black land-grant institution. As a final note about the significance of place in this research, it is worth remembering that the Monsanto Company (now owned by Bayer) is located in St. Louis, Missouri, and that its influence on the state's agriculture industry cannot be overstated.

Data Sources and Iterative Analysis

A feature of case study research that also aligns neatly within the ecogender studies framework is the use of multiple data sources to facilitate triangulation (Banerjee & Bell, 2007; Stake, 1995). Unlike many traditional qualitative studies, which emphasize participant interviews as the primary data source (Creswell, 2013), for this study, only two formal participant interviews were conducted. This elimination of data hierarchies in favor of a more holistic, immersive approach to data collection and analysis is a response to Banerjee and Bell (2007). While researchers often describe data sources as "primary" or "secondary," in this work I reject the masculine acts of categorization and ranking of data and present the discussion of sources more generally.

The ongoing, iterative process of qualitative data collection and analysis in this study began with the accumulation and analysis of electronic artifacts in the vein of a traditional document analysis (Bowen, 2009). To begin, I conducted keyword searches on Instagram using various hashtags such as #queerfarmers (which yielded 2,369 posts), #farmher (108,561 posts), and #queerswhofarm (718 posts). Interestingly, the hashtag #landdyke only yielded five posts at the time of data collection, which may speak to a generational division (women who identify as landdykes may not be women who utilize Instagram). In a way, this process of data collection constituted a virtual method

of snowball sampling (Browne, 2005), because with each click on a hashtag I was led to posts with different, but tangentially related keywords I had not thought to search for before, such as #ruralqueers or #countryqueers. It is fitting to frame this as virtual snowball sampling, because following these hashtag trails provided insight into relatively concealed virtual populations, just as snowball sampling of participants provides entrée into populations that are hidden from the world in some way.

The Instagram posts served as a first step into the electronic document analysis component of the research. All posts were not critically analyzed, as most of them did not fall within the bounded system of the case study (Missouri, lesbian, farmer/agriculture). Most posts represented a context other than Missouri, as identified by Instagram's location tagging, and the term "queer" is far more inclusive than "lesbian," so many posts represented individuals who did not meet the inclusion criteria of the case. A final purposive sample of 50 appropriate images was analyzed using a framework for visual content analysis, which drew from Highfield and Leaver (2015) and Hochman and Manovich (2013). A limitation of this data source is that lesbian farmers may not use Instagram personally or professionally, or if they do, they may choose not to tag their photos with the listed hashtags. Acknowledging the limitations of these data, they nevertheless contributed to the substantiation of themes from analysis of interview, observational, and additional artifact sources.

The next layer of electronic data came from a sample of 10 websites of lesbian-owned and/or -operated farms in Missouri or bordering states. The boundary for this sample was expanded slightly due to the small number of websites of appropriate farms in Missouri alone. Websites were selected based upon either my previous knowledge of or engagement with the farm, or they were found through the Instagram keyword search process described above. I verified that the farmers identified as "lesbian," as opposed to "pan-" or "bisexual," by either direct member checking (asking the farmers themselves), confirming the use of the term in their online presence (website or Instagram feed), or as part of the snowball sampling process (asking

self-identified lesbian farmers to point me towards other lesbian farmers). The textual content of the websites, with a specific focus on the "About" page or homepage of each site, was copied and analyzed line-by-line to begin the focused process of theme development (Bowen, 2009). Although this analysis preceded much of the remaining data collection, as an iterative process, I returned to these websites and photographs repeatedly over the course of the study to re-ground myself in the case and triangulate findings.

Unstructured interactive interviews (Corbin & Morse, 2003) and observation constituted additional sources of data, which were collected over a two-year period. In total, I engaged in conversational data collection with 10 of Missouri's lesbian farmers and conducted approximately 60 hours of observational data collection. Sites of observation included participants' farms during their routine workdays, relevant agricultural production conferences, and queer farmer social events. A reflexive journal of notes constitutes the audit trail of this data collection process (Creswell, 2013). Finally, two archetypal lesbian farmers in Missouri were formally interviewed to further substantiate emergent themes and gather representative quotes to pair with the themes. These 90-minute, semistructured interviews were conducted on each farmer's respective farm and were fully transcribed and coded. Both women were identified through my networks within the Missouri agriculture and queer communities, and purposively selected based on their diverse experiences within and knowledge of Missouri agriculture. Their embeddedness in the social and agricultural landscape of the region lends additional depth to their contributions to the research. Participants are assigned pseudonyms in the findings.

Researcher Reflexivity

An acknowledgment of the researcher's positionality and biases is necessary in qualitative research, as the researcher serves as the primary research instrument (Creswell, 2013). This disclosure is additionally important in case study research, which is often accused of fostering verification bias and confirming the researcher's preconceived notions about the study topic (Yin, 2003). At the time of

the research, I was embedded in the local sustainable agriculture community. I am a queer woman, and I was the sole instrument of data collection and analysis. My family has farmed in Missouri for six generations, and I have a deep connection to the state and affinity for its history, landscape, agriculture, and communities. I have an unquestionable personal bias in developing and conducting the study, and took care to bracket out my own opinions and experiences throughout data collection and diligently engage in reflexive journaling to examine and question my positionality and limit my influence on the data. While bias stemming from my personal standpoint is unavoidable, my position within the bounded system granted valuable entrée into the research population and insight into the subtleties of their lived experiences.

Trustworthiness

Qualitative researchers grapple with establishing and expressing the validity of their findings (Creswell & Miller, 2000), especially when working across disciplines or combining social and natural sciences (Rust et al., 2017). I worked to establish trustworthiness throughout the process, specifically the credibility, dependability, and confirmability of the work (Lincoln & Guba, 1985). I engaged in ongoing member checks in which I shared data and its interpretation, as well as the final manuscript, with participants to ensure that the research findings appropriately represented their experiences (Creswell, 2013). The case study was conducted within a tightly bounded system, so I make no claims of generalizability of the work, although transferable lessons may be drawn from the findings to other relevant contexts. I acknowledge that there may be other interpretations of the data. Data collection was continued until a complete understanding of the participants' perspectives was reached. Given the data sources and methods of this research, the "complete understanding" was achieved when Instagram and website artifacts, as well as observation and interview data, became redundant.

Findings

From the analysis of the semistructured and unstructured interviews, electronic artifact data, ob-

servational data, and reflexive journals, five clear themes emerged: Building community, working relationship with men in agriculture, female masculinity, proving yourself, and conservative surroundings. Below are the descriptions of each theme, representative examples or quotes, and any corresponding subcategories.

A Note About Sustainability

Although it was not a criterion for inclusion, all lesbian-owned or -operated farms included in the research were small (under 10 acres or 4 hectares in production), diverse, and "sustainable" (described by participants in myriad ways, including certified organic, not certified but utilizing organic practices, ecological, no-till, or holistically managed). Farmers engaged in community supported agriculture, market farming, and restaurant sales. Participants would frequently position themselves within a paradigm of sustainability, and then contrast that with the paradigm of their surroundings. In the electronic artifacts, a commitment to sustainable agriculture was proudly highlighted and utilized to market farm products to interested consumers. Literature has explored connections between women farmers, queer farmers, and sustainable agriculture, so this trend was not surprising. Rather than pull this out as a discrete theme, when reading the findings below, it is useful to keep the overarching context of sustainability in mind. Retaining sustainability and cooperation with nature as an overarching context also serves to place each of the five discrete themes within the ecogender studies framework of the research.

Building Community

The topic of community, and the importance of building community, was omnipresent throughout data collection and findings development. This theme may be broken down into two similar but distinct subcategories: community supported agriculture and community support as a lesbian. These separate yet parallel concepts of community speak to the types of agriculture and the particular agricultural lifestyles to which Missouri's lesbian farmers were drawn.

Community supported agriculture (CSA), the more clearly defined and professionally relevant

concept of the two, featured prominently throughout the electronic artifacts, with most farmers highlighting their CSA model on their websites. Both semistructured interview participants participated in the CSA model of farming. Jill talked about deciding to become a farmer after joining a CSA, stating, “I had no idea that people did this for a living. I had no idea that there was the potential for a community to be built around food production.” This comment, which Jill often reiterates whenever she is asked about her operation, reflects the philosophy many participants held about the CSA model. Though it is possible to participate in a CSA in a purely transactional way, the participants, and their followings of customers, prioritized the *community* element, as illustrated by CSA member potlucks, frequent member workdays, and members-only farm parties.

In addition to the “community” in the CSA model, participants shared stories of the community built around the farmers market through regular interactions with customers, exchanging of recipes, and so forth. These linkages were clearly visible during observational data collection at open farm workdays. In these connections, the focal points of the community support were the food the farmer was growing or the land they were cultivating. Community members supported the women’s lesbian identities by default, because CSA members, volunteers, or market shoppers supported the lesbian farmer as a steward of an agricultural system in which the consumer believed.

The subcategory of community support as a lesbian took a different form for each participant. Jill, who lived in an isolated, rural location, shared many stories of the male “gatekeeper” who helped her integrate into the community when she first arrived. She described the development of her “very dear, deep friendship with him,” and that it “paved the way” in the community. She stated, “he won’t let anybody say anything bad about me. Doesn’t matter that I’m a lesbian, doesn’t matter that I’m a woman.” Finally, she said:

People in the country are so willing to help you if you need anything, but you have to be willing to try to become somehow part of the community. So if you as a farmer, lesbian,

whatever, if you cannot figure out a way to get into the community and make yourself not so much of an outsider, then your life is gonna be tough.

Jill derived community support from her rural Missouri neighbors, but was able to provide support and serve as a mentor for young lesbian farmers who found their way to her farm in droves. In contrast, Laurie spoke more extensively about the notion of finding the support of the lesbian community within agriculture. She said that when she began farming, “it was pretty apparent that there are lots of lesbians in this career.” She described her first farm internship, at a farm with an all-female staff and a lesbian director, as overwhelmingly positive, stating, “all of us, all women, working together made my introduction a lot easier than if I had gone to a place where it was all men and I felt inferior the whole time.” Several participants shared this experience of seeking out lesbian mentorship on the farm. Women spoke of finding farming shortly after coming out as lesbian, and of feeling safe on the farm when they did not elsewhere.

Laurie had farmed in rural and urban environments throughout Missouri and had encountered supportive lesbian farmers in each location. Formerly, she had co-owned and operated an organic vegetable farm with her then-partner, a fellow lesbian farmer, for three years. They developed deep connections with an older lesbian landowner down the road from their farm. Laurie said, “we hung out with her a good amount. She had some friends, older lesbians, who would come over and we would have dinner. We got to know them pretty well, and that was kind of our community for those years.” These lesbian community connections transcended rural and urban divides, but again retained the physical farm, or at least the realm of agricultural production, as the central context.

Working Relationship with Men in Agriculture

Participants extensively discussed their varied perspectives on working with men while farming. Some women found positive experiences of welcoming mentorship from straight male farmers, some experienced extensive negative interactions

with men, and others worked to avoid men altogether, gravitating towards women-run farms reminiscent of the radical lesbian feminism of the landdykes.

As alluded to in the previous category, Jill's positive working relationships with men were typified by the older neighbor who helped her integrate into her rural community. In addition to helping her in that way, this particular friend regularly visited her farm to assist with farm chores. She said, "I found him, and he's been a farmer his whole life!" and said that although he was in his seventies, he came to the farm nearly every day to help out. She said, "I stock up in my mind, in my list of things to do, which is very long all the time, anything that has to do with a tractor because I know he's gonna show up sometime and need something to do." Jill also reflected on a male farmer mentor for whom she had worked very early in her farming career, stating, "I loved working for him, but I realized when I was working for him that I wanted to own my own farm." Jill acknowledged that while her experiences working with and for men in agriculture had been overwhelmingly positive, she understood that they were "probably very, very different" from those of other women she knew working in agriculture, and she remarked that she "has been severely lucky."

While Jill had been "severely lucky" in her working relationships with men, Laurie had not. After a series of apprenticeships, she and her former partner entered into an unconventional business relationship with an older male landowner in Missouri. While he retained ownership of the land, the two women co-owned the organic farm business and facilitated all of the farm operations (CSA operation, market sales, and direct-to-restaurant sales). While the women were in the partnership because they needed land but wanted to run things themselves, Laurie believed that what the landowner wanted from the partnership was the ability to be a mentor. She perceived heavily gendered overtones to the dynamics of this relationship. She said, "In terms of being a woman, there were definitely things that he thought we couldn't do on the farm that we really could." Over time the relationship became quite strained, especially as the farm business became successful. Laurie reflected:

He might say something totally different, but I felt like he wanted to bring us in so he could teach us things and he could get credit for teaching us things, and when he realized that we didn't need to be taught, and that actually we were really successful without him, he didn't like that so much.

I observed many of these contradictory working relationships with men throughout data collection, and they were often complicated by other factors such as age or race of either the men or the lesbian farmer participants. Older men would often "mansplain" farm tasks to the participants without first asking whether the women already knew what they were doing. While some women ignored the instructions of men, or reclaimed control of the situation and established their authority as a farmer, others carefully negotiated these interactions so as to avoid seeming "aggressive." Cautious negotiation was observed most frequently when the man involved in the interaction held a position of power over the woman and the woman did not want to offend him. Additionally, men with whom the women worked seemed to push professional boundaries with the participants and remark to them about the "hotness" of other female farm employees or made other similarly inappropriate statements.

Female Masculinity

This theme addresses concepts of gender presentation and identity among participants. Laurie reflected on her own relatively masculine gender presentation, and tied it to her observations about the prominence of lesbian women in agriculture, stating:

I think farming is considered more masculine, and you have to have some characteristics that aren't particularly girly. Like being strong and being dirty, and recognizing that my hands have callouses, and my nails are short because if I had long nails I'd have dirt under them all the time. So these kinds of characteristics tend to be more attractive to lesbians who feel like they have a little bit more masculinity in them.

She also said, “I was definitely a tomboy, and still am, probably.” Additionally, Laurie described what she perceived to be a special intersection of female masculinity, lesbianism, and market farming. She shared,

I think that as a lesbian who kind of embodies some of these masculine qualities, being strong and kind of burly, calloused and dirty, but also being a woman that appreciates and respects and wants to nurture the land, [market vegetable farming] is kind of the best of both worlds in that way. You’re farming but you’re also doing something that is nurturing.

Notions of gender presentation revealed themselves during observational data collection and electronic artifact analysis. Superficially, the lesbian farmers I observed generally wore stereotypically masculine clothing while farming, such as Carhartt pants and overalls, flannel shirts, and sturdy boots. Oftentimes these women were dressed more practically and masculinely than self-identified straight women coworkers, who were seen wearing shorts, tank tops, or sandals (and on one farm, were regularly scolded for the impracticality and inappropriateness of such clothing). The websites of lesbian-owned and/or -operated farms, if they featured photos of the farmers themselves, showed the women engaged in farm work, dressed accordingly, or holding bountiful harvests of produce. These official, business-oriented sites were not used as platforms to challenge gender stereotypes but to advertise the farm. An exception to this was a flower farmer couple’s website that advertised their services for *all* weddings by highlighting their involvement in the legal case that successfully challenged Missouri’s gay marriage ban. Still, photos were often of flowers, children, and livestock—images that conveyed an impression of a feminine, nurturing approach to agriculture, rather than one of dominion. These images contrasted with those on Instagram, arguably a more youthful and boundary-pushing platform than professional websites, which displayed intentional “queering” of agriculture and expectations of gender presentation. For example, one image featured long, painted fingernails digging in the dirt and was tagged

#fiercefemme, while another showed a farmer with short hair, a large bouquet of flowers, and a shirt that read “get dirty.” Although the theme of female masculinity remains salient, these contrasting instances illustrate the fluidity of gender expression and complicate a rigid stereotype that automatically equates masculinity with lesbianism or femininity with straightness.

Proving Yourself

Participants consistently reflected upon the importance of “proving themselves” in agriculture as a male-dominated industry. A narrative repeatedly emerged that differences in gender, sexuality, farm background, or age were secondary, and that the primary motivation in the participant’s work life was to become a good farmer and prove to the world that she was competent. Laurie explicitly stated:

I feel like just being a woman in agriculture in this part of the country is rare and different and I find myself having to prove myself to lots of the men around me because they’re older, they’re white, they’ve grown up on farms or been around farms for a long time. I never want to come off as a prissy girl who doesn’t know how to operate machinery or lift something. I never want them to feel like they have to say, “oh, let me do that for you, miss.”

Laurie’s discussion of needing to show that she was competent intersects clearly with conversations about negative and positive working relationships with men and the ensuing “mansplaining” that occurred during those interactions. Laurie’s professional dynamic with men diverged from that of her straight female coworkers, who often asked for men to come complete a task on the farm. For a time, Laurie worked for a straight female supervisor, who made comments about leaving certain tasks, such as maintenance of machinery or heavy lifting “for the boys to take care of.” These requests, laden with traditional gender roles and expectations, caused significant tension between Laurie and the supervisor, a tension which, when examined in light of Laurie’s need to prove herself as a farmer, is not surprising.

Like Laurie, Jill described how proving yourself as a competent farmer was the most important way to gain acceptance as lesbians and women in the Missouri agricultural community. Jill presented an excellent illustration of the value of the common ground of being a good farmer superseding other differences by sharing a story of a friend overhearing a conversation about her at a restaurant in a nearby town:

He was just sitting at a table having a cup of coffee and there were two old dudes sitting at the table right next to him, and, he hears one of them say “did you hear?” and my friend, he’s so hilarious, he’s playing this crazy accent and says, “did you hear that those two lesbians down at [farm], did you hear that one of them, she had a baby?” and you know, they’re kind of going on and gossiping between themselves and my friend was sitting there listening, he could hear them talking about this, and he said he was two seconds away from turning around to say something to them, but one of them stopped and said, “well, I know, but I heard that the other one, she’s a real hard worker. . . . and so, you know, I guess it’s probably okay.”

As Jill reflected on the story, she believed that the gossiping men had justified and made sense of what was, in two women living together and having a baby, a serious challenge to their norm by deciding that, “one’s a hard worker. And she’s farming. So I think it’s okay.” To prove themselves as farmers, participants sought out extensive professional development, attended local and national conferences, conducted grant-funded research on their farms, and consistently worked to improve their farming practices and expand their farms. Together, three lesbian farmers in Missouri founded the Missouri Young Farmers Collective, which provided monthly social events and farm tours for participating farmers and hosted a yearly educational workshop. While the genders or sexual orientations of the founders did not push the organization toward an explicitly queer mission, it is telling that through the organization, these women found ways to simultaneously build community and improve themselves as farmers.

Conservative Surroundings

Participants faced the twin challenges of attempting to advance small-scale, sustainable agriculture in the row crop–driven state of Missouri and attempting to live a full life as a lesbian in a conservative area. Discussions of these two forms of conservatism permeated the data collection. Conservatism as a concept, specifically a concept that set the participants apart from their surroundings and made them different in some way, emerged as religious and political conservatism, as well as a more conservative or conventional form of agriculture. Jill described the location of her farm as “the heart of the Republican Bible belt.” Although farming and a shared commitment to the land helped Jill to build relationships with her conservative neighbors, there were still times when their differences were too deep to bridge. Jill spoke of a hurtful incident with close friends she had made in her community:

They’re Pentecostal. They’re hard core Christians. And when we [Jill and her now wife] had our commitment ceremony in 2010, the first year that I was farming, we sent them an invitation and they would not come. They’re really religious, and he doesn’t think it’s right; he thinks that people that are lesbians or gay had to have been mistreated as children because that’s the only explanation he can come up with in his mind of why somebody would be gay.

Finally, Jill reflected upon the agricultural conservatism in her area, stating, “I mean obviously I’m not selling my produce to the people that are out here in this community . . . mostly I sell into an urban, liberal community, and if I didn’t have that I would not be able to farm, for sure.” Jill’s certified organic, “FarmHer” grown produce was a hot commodity in the liberal college town 45 minutes from her farm, but to those in her immediate vicinity, she and her agricultural practices were quite anomalous. Laurie expanded on a similar notion of agricultural conservatism and how it contrasted her philosophy and methods of farming, stating:

What I guess I should say is that, row crop

farming versus market farming, you could kind of categorize row crop farming as being more rural and conservative, kind of old school conservative, kind of good old boy type of conservative. Versus vegetable farming where you have a lot of young people who have never farmed before coming into this profession, and so you end up with, I think, a more liberal group of people in general who are growing vegetables over row crops.

Both participants discussed how having a more liberal market for their produce, and the more liberal, young agricultural community toward which they gravitated, made being a lesbian a non-issue in these circles, even though in the broader Missouri agricultural landscape they encountered prejudice.

Discussion, Conclusions, and Implications

Although instances of intolerance and bias existed, overall, the story of Missouri's lesbian farmers was one of empowerment and pride. Consistent with the literature, participants expressed fulfillment in being able to feed their communities and work collaboratively with nature, all while comfortably enacting a gender expression of female masculinity (Jarosz, 2011; Kazyak, 2012; Rissing, 2013; Trauger, 2004). While the theme of "proving yourself" that emerged from the data was not explicitly expressed in prior literature, it was reminiscent of Kazyak's (2011) theme of "being a good person" (p. 571) in that it justified one's existence in and contribution to the rural space. The notion of "proving yourself" also intertwined with other scholarship on rural queer community-building (Bell & Valentine, 1995; Leslie, 2017). Participants noted the abundance of fellow lesbians in sustainable agriculture, reflected on the value of lesbian mentorship in their personal and professional lives, and described the profession as a welcoming space for queer women.

The experiences of the women in the study track closely with the six themes outlined in FAST (Sachs et al., 2016), as they asserted the identity of farmer, integrated their economic, environmental, and social values into their farming practices, and negotiated their roles in agricultural institutions. The scholars who developed FAST acknowledged


that it "is not a conclusion but rather a tool" offered to "better understand women in agriculture more thoroughly" (Sachs et al., 2016, p. 148). By attending to sexuality, and not just gender, I aimed to further this process of understanding the multifaceted, intersectional experiences of women farmers. Layering a marginalized sexual identity on top of a marginalized gender identity (in agriculture) requires us to complicate our perceptions of even seemingly inclusive, feminist worldviews, organizations, or social systems.

This study marks a contribution to the body of ecogender studies work in that it utilized the framework in a North American agricultural context, and it considered gender in intersection with sexuality (Banerjee & Bell, 2007). Participants demonstrated a gendered and sexuality-influenced means of engaging with the environment and natural world through agriculture. Electronic artifact sources reflected this ecological commitment, illustrated by quotes such as "My goal is to give back more to the soil than I take," and "Our mission is to provide sustainably produced, high-quality foods to our community while improving the land and upholding our values of social and ecological justice." Additionally, participants embodied the emancipatory potential of engaging in meaningful, self-directed work in cooperation with nature (Salleh, 1984). Missouri's lesbian farmers seamlessly addressed the three legs of the stool of sustainability—economic, social, and ecological—in their discourse, and represent an important population to engage in advancing sustainable agriculture and building resilient food systems.

While many experiences of Missouri's lesbian farmers may be consistent with those of straight women farmers in Missouri, or with the experiences of women-identifying farmers throughout the United States, it is critical that researchers and practitioners attend to those that are different. In this case study, participants described several distinctively lesbian experiences that warrant further exploration. Lesbian mentorship and/or seeking out a lesbian-owned farm as a safe space to work was important to some participants, especially during their "coming out" process. Though participants generally felt more comfortable on women-owned farms than those owned by men, the addi-

tional layer of safety they felt when the woman owner was a fellow lesbian differentiated the “lesbian experience” from the “woman experience.” Critical distinctions between the experiences of women farmers and lesbian farmers also emerged in the example of Jill’s close, conservative farmer friends refusing to attend her commitment ceremony, and in the gossip about her wife having a baby. While straight women farmers may also feel the need to prove their competence, in Jill’s case, proving herself as a farmer meant justifying her right to be married and have children. If Jill were a straight woman, her human rights might not be so dependent on her work ethic.

I argue that Missouri’s lesbian farmers have a unique set of experiences within the landscape of agriculture in the United States and that their perspectives provide valuable insight into addressing issues of sustainability. Small-scale, sustainable agriculture is a welcoming space for lesbian farmers without a farm background, and I encourage concerted recruitment efforts targeting these popula-

tions. Additionally, I encourage conservation agents, extension professionals, and food systems practitioners to educate themselves about issues pertaining to rural queer livelihoods and to engage with and learn from lesbian farmer populations. As Leslie (2017) has argued and I reiterate, agriculture can only be ecologically and socially sustainable when the identities, perspectives, and epistemologies of queer people are fully embraced. Rural America faces ongoing, expansive population decline and economic depression, and the vitality of these communities hangs in the balance (Cromartie, 2017). The lesbian farmers whose stories contributed to this study represent a subset of the United States population who are eager to move to the country, care for its land and resources in sustainable ways, and contribute to communities and economies in rural locations. Future work should examine barriers to land access faced by lesbian farmers and should interrogate further questions of the emancipatory potential of agriculture for both farmers and nature. 

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Connecting small-scale producers and consumers: Exploring the feasibility of online food hubs in low-income communities

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Abstract

Sustainable agriculture and community food security (CFS) are frameworks commonly used, but often separately, within the broader alternative food movement. Sustainable agriculture is production-centered, with a focus on environmental degradation and family farm viability, whereas CFS shifts research from household-level measures of food

security to consider larger geographic areas in terms of equitable healthy food access and social justice. The challenge of both movements continues to be the intersection of these ideals to create a sustainable situation in which the needs of producers and consumers can be met simultaneously. We explored the underlying values of local, small-scale producers and consumers living within an impoverished neighborhood in Columbus, Ohio, a large Midwestern city, as they related to participation in an online food hub. Twenty-one consumers participated in three focus groups, and interviews were conducted with eight producers. Our interest was primarily in whether and how these articulated values fit into sustainable agriculture and CFS frame-

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Authors' Note Regarding Implications of COVID-19

Our research was conducted before the COVID-19 pandemic. An addendum on pages 14–15 provides relevant updates to the research as of late April 2020.

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works, and if there was any evidence of commonalities or intersections between producers and consumers in the context of these frameworks. We hypothesized that producers would be oriented toward the economic viability of their small-scale operations, while consumers would be oriented toward improved food access that was convenient and affordable. We identified three prominent themes from both the consumers' and producers' articulated values. We found that an online food hub appealed to some producers and consumers, but that the barriers identified were more prominent than the benefits, and the desire for the proposed online food hub was not sufficient to pursue moving forward with a full-scale version of an online food hub at the time.

Keywords

Community Food Security, Sustainable Agriculture, Alternative Food Network, Food Access, Local Food, Online Food Hub, Low-Income Community

Introduction

Over the past three decades, academics, practitioners, and activists have brought the ideals and language of sustainable agriculture and food security into the U.S. vernacular through research (e.g., see Alaimo, Briefel, Frongillo, & Olson, 1998), federally funded projects (e.g., Sustainable Agriculture Research and Education, 2012; U.S. Department of Agriculture [USDA] National Institute of Food and Agriculture [NIFA], 2017, 2018), Farm Bill policies (e.g., Agriculture Act of 2014), and higher education programs (USDA National Agricultural Library, n.d.).

Allen's (2004) seminal "alternative food and agriculture" research frames sustainable agriculture as more "production-centered," and focused on issues like "environmental degradation and the viability of the family farm," while community food security (CFS) primarily is oriented toward "distribution and consumption, such as food access and nutrition" concerns (p. 2). These approaches are often referred to as alternative food networks (AFNs) (Sarmiento, 2017). AFNs emphasize access to fresh, unprocessed foods grown in or near the community in which they are sold and aim to provide direct-to-consumer engagement between pro-

ducers and consumers (Bruce & Som Castellano, 2017). Farmers markets, community supported agriculture (CSA), mobile food markets, food hubs, and urban farms are examples of AFNs.

The present research is part of a broader feasibility study for an online food hub in a low-income, low-food access neighborhood in Columbus, Ohio, that was conducted by a private theological school, a public land-grant institution, an institutional farm, and a nonprofit inner-city urban farm. Food hubs, one type of AFN, can take various forms. They are spaces, physical or virtual, that strategically coordinate (Berti & Mulligan, 2016) aggregation, distribution, and marketing of local food for producers to expand their market (Levkoe et al., 2018). We were interested in exploring the underlying values of producers and consumers as they relate to participation in an online food hub. Furthermore, our interest was primarily in whether and how these articulated values fit into sustainable agriculture and CFS frameworks, and if there was any evidence of commonalities or intersections between producers and consumers in the context of these frameworks. We hypothesized that producers would be oriented toward sustainable agriculture, specifically in terms of the viability of their small-scale operations, with some level of interest in improving food access. We hypothesized that consumers who were residents of the low-income, low-access neighborhood would be oriented toward improving food access through convenience and appropriate pricing.

Literature Review

A prolific, multidisciplinary body of research about food security exists, while CFS research is less predominant. Among these, annual USDA Economic Research Service [ERS] U.S. food security reports (e.g., Coleman-Jensen, Rabbitt, Gregory, & Singh, 2018), Feeding America's accessible *Map the Meal Gap* research and hunger reports (e.g., Gundersen et al., 2017; Weinfeld et al., 2014), and Ver Ploeg et al.'s (2009) report to Congress about food deserts have brought attention to issues that exemplify historical and contemporary interconnected economic, racial, and geographic disparities. These are also evident in an abundance of peer-reviewed literature related to food access (e.g., Larson, Story,

& Nelson, 2009; Raja, Ma, & Yadav, 2008; Zenk et al., 2005), food insecurity and poverty (e.g., Cook & Frank, 2008), and physical and mental health consequences (e.g., see Casey et al., 2004; Gundersen & Ziliak, 2015; Martin, Maddocks, Chen, Gilman, & Colman, 2016; Olson, 1999). CFS shifts research from household-level measures rooted in economic, racial, and social characteristics with dietary and health outcomes to research that is intended to consider larger geographic areas in terms of social justice, equitable healthy food access, community self-reliance, culture, environmental sustainability, and public health (Hamm & Bellows, 2003; Pothukuchi, Joseph, Burton, & Fisher, 2002; Winne, 2004). CFS activities are similar to AFNs and include CSAs, farmers markets, community gardens, farm-to-institution programs, community food assessments, food policy councils, community development, and planning programs (Community Food Security Coalition, n.d.).

Sustainability values relate to creating and maintaining balanced eco-social systems that promote equity across communities, social justice for consumers, fairness for food system workers, and ecological considerations for interdependent systems (Agyeman et al., 2002; Allen, 2004; Webber & Dollahite, 2008). Thus, sustainable agriculture research has focused on topics like soil health (Doran & Zeiss, 2000), climate change (Lal, 2004), economic viability of small farms (Ikerd, Devino, & Traiyongwanich, 1996), human health (Horrigan, Lawrence, & Walker, 2002), justice and equity (Agyeman, Bullard, & Evans, 2002; Allen, 2010), and AFNs (Allen, 2004; Feenstra, 2002; Hinrichs, 2000).

The challenge of both movements continues to be where these ideals can intersect to create a sustainable situation in which disparate needs of producers and consumers can be met. Low-income consumers may be interested in fresh, healthy, local produce, but may experience food access issues related to limited flexibility in food budgets (Bruce & Som Castellano, 2017; Byker, Shanks, Misyak, & Serrano, 2012; Webber & Dollahite, 2008), availability of food items (Kaiser, Carr, & Fontanella, 2017), inconsistent transportation (Bruce & Som Castellano, 2017; Di Noia, Monica, Cullen, & Thompson, 2017), and inconvenience (Bruce &

Som Castellano, 2017) while farmers need to consider production scalability of their land, products, and market potential (Webber & Dollahite, 2008). In addition, Webber & Dollahite's (2008) research underscored the importance of relationship-building that is needed and/or desired between producers and consumers, which of course takes time and effort for both groups.

Food hubs are one form of AFNs that connect small, local producers and neighborhood consumers (Berti & Mulligan, 2016). Engagement and meaningful connections between producers and consumers are important in terms of differentiating localized markets from conventional markets (Berti & Mulligan, 2016, Perrett & Jackson, 2015). Values that underscore successful food hubs include transparency, democracy, equity, and access (Berti & Mulligan, 2016). Transparency allows for the modes of production, quality, and traceability of food to be shared with consumers. Democracy places the control of the supply chain into the hands of the small producers. Equity generates fair income for the small-scale producers, concurrently offers food at reasonable prices for the consumer, and extends accessibility to low-income populations. Access is about getting the food to consumers in an organized way that maintains a short supply chain (Berti & Mulligan, 2016).

Online ordering platforms have the ability to reach those who live in food deserts or are food-insecure by eliminating physical access and transportation issues to securing food. This could help achieve an AFN goal of reaching marginalized populations. An online system also has the potential to connect consumers with a greater number of local producers because the aggregation, marketing, and distribution of food are an organized effort.

Methods

This research was part of a larger collaborative project funded through Ohio State University (OSU), a public land-grant university, and included faculty from OSU, the private Methodist Theological School in Ohio (MTSO), Seminary Hill Farm at MTSO, Franklinton Farms nonprofit urban farm, and the Ohio Cooperative Development Center, which facilitates the Ohio and West Virginia Food

Hub Network. Our research reflects the shared values of the group's partners: the desire to bring together sustainable agriculture with CFS. The unique partnership brought together localized knowledge about food access and food production to explore the viability of an online food hub that could serve areas with low food access and provide new markets for local producers.

The research team sought perspectives from both residents living in the extremely impoverished Franklinton neighborhood in Columbus, Ohio, and small-scale Ohio producers; participants were selected by using established connections of the project partners. We adopted a pragmatic approach (Vannini, 2008) to investigate how producers and consumers each think about the possible challenges and opportunities of engaging with a local online food hub. The qualitative methods used were driven by the research questions and chosen to enhance existing knowledge (Nowell & Albrecht, 2018; Tashakkori & Teddlie, 2010) on food hubs, CFS, and sustainable agriculture. Research questions were defined utilizing the CFS framework, as well as the knowledge and questions that emerged from the collaborative group. Semistructured producer interviews, consumer focus groups, and consumer demographic surveys were used to gain a more complete picture of the opportunities and challenges of a locally sourced online food hub. When interacting with participants, the research team emphasized the preliminary nature of this research and that, though we sought to understand the viability of a food hub, the pilot of this project was not guaranteed.

Data Collection Procedures

Producers. Fifteen small-scale producers within 150 miles (241 km) of Columbus, Ohio, were identified through previously established relationships with Seminary Hill Farm and MTSO. Family farms that grossed under US\$350,000 in annual sales were identified as small-scale farms (Burns, 2018). Eight of these 15 producers were recruited to participate in a semistructured interview with two trained researchers. Researchers contacted producers via phone to gauge interest in participating in the study, and the principal farmer or the person who was most engaged in the management and de-

cision-making of the farm's production was recruited to participate. In many cases, this person was the farm owner. If the producer agreed to participate, the research team members travelled to the producer's farm to conduct the interview. Each interview lasted at least 30 minutes.

After arriving at the farm, the lead research team member reviewed the study's aims again and reviewed the consent form with the producer. The lead researcher conducted the interview, taking minimal notes, while the other researcher took notes on the entire interview in as much detail as possible. Producer interviews were not tape-recorded in an effort to create an optimal setting for producers to feel comfortable enough to fully participate in the interview process. Producers were asked questions related to their willingness to engage in a possible online food hub, the type of products they might be interested in growing for this new market, pricing of those products, level of experience with wholesale markets, logistical opportunities and challenges with the proposed market, and any current third-party certifications. The semistructured interview design gave researchers the ability to ask open-ended and follow-up questions as needed to gather a sufficient level of detail from producers.

Immediately following each interview, the two research team members debriefed together to ensure the most objective understanding of the producers' responses. Within 24 hours, each team member documented her interview notes on a commonly shared online portal for other team members to review. Detailed records of all personal and methodological notes were also documented to account for decisions, inferences, and interpretations related to data collection, analysis, and study procedures.

Consumers. Residents of the lower-income neighborhood of Franklinton in Columbus, Ohio, were recruited via informational flyers and word-of-mouth to participate in focus groups. The focus groups were held at the neighborhood public library in the evening on different days of the week. Participants were allowed to bring children, and food was provided. Twenty-one residents participated, spanning three focus groups, each of which

lasted 90 minutes. As an incentive, each participant received a US\$20 gift card to a local supermarket. A licensed court stenographer provided live transcription, which was later sent to researchers for analysis.

After consenting to participate, focus group members were first asked to fill out a 30-item survey, which documented demographic information, food security measures, and household food access methods. The lead research team member then facilitated a discussion prompting input about an online ordering system developed to improve food access within their community. Focus group members were asked questions related to their current food access, food-related values that may affect their decision-making, participation in AFNs, interest in online food ordering, interest in local food, and current neighborhood communication mechanisms.

Data Analysis Procedures

The research team engaged in inductive analysis to identify themes that emerged from the producer interviews and the consumer focus groups using structural and data-driven coding processes (DeCuir-Gunby, Marshall, & McCulloch, 2011). Three researchers, two of whom led the focus groups and interviews, reviewed interview notes and focus group transcripts. Each researcher independently coded data for general themes and discussed those themes with members of the research team, reconciling any differences and discussing interpretations (DeCuir-Gunby et al., 2011; Padgett, 2008). The researchers then discussed the interviews and transcripts in the context of the original values and frameworks of sustainable agriculture and CFS, revising code names to create a theory-driven codebook (DeCuir-Gunby et al., 2011). The qualitative methodological rigor used for the study is considered both dependable and trustworthy, which is akin to validity and reliability in quantitative studies (Franklin & Ballan, 2011). Language used to identify the key themes presented in this paper reflect the words used by participants during interviews and focus groups. The research team then identified quotes to use as supporting evidence. Surveys were analyzed using descriptive statistical analysis in SPSS.

Results

Producers

Producer Characteristics. Small-scale Ohio producers interviewed for this project had established relationships with Seminary Hill Farm and MTSO and were located within a 150-mile (241-km) radius of Columbus, Ohio. Most of the farms were primarily operated by the farm owners with occasional hired support. In line with MTSO's commitment to environmental sustainability, these producers employed a variety of sustainable agriculture practices, including minimizing chemical inputs, using non-GMO seed and animal feed, raising livestock on pasture, and diversifying production. One producer had organic certification through the USDA, although others described their farms as using organic practices.

Of the 15 small-scale producers identified, researchers conducted semistructured interviews with eight. Producers were less available to participate in the research process because interviews were conducted in late spring and early summer, a very busy time for growers. The eight producers interviewed offer an array of products, including fruits, vegetables, eggs, chicken, turkey, pork, beef, lamb, canned and pickled produce, honey, condiments, and sauces. While all had diversified production strategies, five mainly produced pastured meat, two focused on fruits, vegetables, and eggs, and one sold fruits, vegetables, and value-added products.

One farm has organic certification through the USDA. The others described their products as grass-fed, pastured, non-GMO, and/or sustainably grown and relied on their customers to "self-certify" them by visiting the farm or establishing a relationship with the farmer. All producers had experience with wholesale marketing beyond selling to MTSO, including selling to restaurants, boutique shops, butcher shops, and other small universities. Six of the eight also marketed their products directly to consumers through on-site sales, farmers markets, or CSAs. While several farms sold to restaurants and customers in the town in which they were located, Columbus is the primary customer base for the majority of farms.

Producer themes. We identified three primary themes in our interviews with the producers: willingness to participate, price guarantees and order reliability, and economic viability of farm business. These three themes are representative of the opportunities and challenges producers identified with participating in a food hub serving a low-income food insecure community.

Willingness to participate. Producers expressed interest in participating in a food hub to provide access to a new market to sell their products, which could support farm expansion. Several producers (P) expressed excitement and willingness to produce new products, citing the ability to earn money with statements like, “If I know I can sell it, I will find a way to produce it” (P9). While six of the producers already marketed their products directly to consumers, the food hub was an opportunity to increase community sales without the need for farmers to lead marketing efforts. Producers wanted to provide quality food to the local community and saw participation in the food hub as a feasible way to do this. “[The farm would] know we’re getting good food out to people, which is our ultimate goal” (P6).

Some producers valued the proposed food hub because it would target distribution in a low-income, food-insecure community and improve food access. However, concerns with this model were also expressed due to the premium prices of the local products. Producers valued “*feeding [their] neighbors*” (P13) and were excited about the food hub project as a new outlet for their products to build the local food system in Ohio. One producer creatively considered how his farm might provide high-quality ground beef at a lower cost for the food hub. Some producers suggested using education about buying local and cooking classes as ways to “*create more sustainable relationships with our food*” (P6). “*Hopefully, the overall scheme will be a new food system for Central Ohio. That’s the dream*” (P4).

Price Guarantees and Order Reliability. A second theme that developed consistently in interviews with producers was the need for price guarantees and order reliability. When considering participation in a new market such as a food hub,

producers wanted a guarantee that the market was viable. P6 and P9 mentioned that they would want a two- to three-year contract to guarantee consistent orders. Expanding production for a new market such as a food hub requires planning, investment, and risk. Producers consistently stated a need for one-year notice for large wholesale orders to plan for the birth and growth of livestock and seasonal rotation of vegetable crops. Farmers needed to know in advance when and how much of their products would be needed. Start-up costs for expansion to meet food hub orders were suggested as a barrier for producers, with two specifically stating they would need help with these start-up costs in the amount of several thousand dollars. P6 stated, “*Small producers cannot cover all costs up-front*,” while P9 said, “*Capital outlay is fairly intensive for a food hub.*”

Producers also explained the need for up-front deposits for large wholesale orders. They noted that the initial outlay of cost and risk could be offset by consistent orders and payments. One producer, in particular, cited his experience working with Seminary Hill Farm as a game changer in the way he does business. After receiving up-front deposits for regular orders from Seminary Hill Farm, this producer went to his other wholesale customers—a butcher shop and restaurants—and asked for deposits. This helped stabilize his business. Farmers need a guarantee of consistent, reliable consumers to make their participation in a food hub economically possible.

Economic Viability of Farm Business. Every producer interviewed emphasized the need for their participation in a food hub to support the overall sustainability and economic viability of their farm business. P10 expressed this concern, saying “*Is this going to be something where producers make money or a labor of love?*” Though producers wanted to participate in this type of food market and were excited to offer their products to a new customer base, they needed to be able to make a profit and make a living through their farm sales. P8 commented, “*My kids need to eat all year*,” while P9 reiterated, “*I know that I’m not going to get rich with this, but I need to make a living—I need to pay the bills.*”

Producers raised concerns about how selling in

a low-income neighborhood and collaboration with other farmers would affect the economic viability of the food hub. Specifically, producers recognized that their local products sell at a premium price, which low-income individuals may not be able to afford and/or may not choose to purchase when similar items are available for lower prices at a grocery store. P3 stated, “*Marketing to that area would be difficult for us,*” and P13 described the predicament by saying, “*I wish I could say we could slash our prices, but with farmers’ margins so low...*” Additionally, some producers shared frustrations that they encountered accepting government assistance payments such as the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC). Producers stated that payments took too long to process and were not desirable, best represented by P3: “*I can’t stuff coupons in my gas tank to get home.*”

Producers also expressed concern that a food hub may create competition and comparison among producers, making the project less profitable for individual producers because the orders received by each would be too small to be economically beneficial. Producers also expressed concerns about marketing their products in aggregate with other farms because they have different standards for their products (e.g., grass-fed vs. grass-finished) and rely on quality differentiation as a marketing strategy. Additionally, logistical concerns about food safety and shared liability when marketing in aggregate through a food hub came up as concerns. P3 asked, “*Whose neck is on the line with food safety?*” Pricing and marketing concerns derive from the larger concern and theme that producers need to make a living from their farms and that participation in a food hub requires consideration of the overall economic viability of the farm business.

Table 1. Consumer Demographics

Variable	Number (N=21)	%
Gender		
Female	15	71.4%
Male	6	28.6%
Race		
White/Caucasian	15	71.4%
Black/African American	4	19.1%
More than one race	2	9.5%
Education Level		
Less than high school	3	14.3%
High school graduate or GED	6	28.6%
Some college or 2-year degree	5	23.8%
Undergraduate degree	3	14.3%
Graduate or professional degree	2	9.5%
Did not respond	2	9.5%
Annual Income (US\$)		
<\$15,000	8	38.1%
\$15,000–24,999	3	14.3%
\$25,000–49,999	1	4.8%
\$50,000–74,999	2	9.5%
\$75,000–99,999	1	4.8%
\$100,000+	1	4.8%
Did Not Respond	5	23.8%
Food Security Status		
Food secure	9	42.9%
Food insecure	12	57.1%
SNAP Assistance		
Yes	6	28.6%
No	15	71.4%

Consumers

Consumer characteristics. Focus group participants completed a self-administered demographic survey. Results are presented in Table 1. Twenty-one (N=21) consumers participated in the three focus groups. The average age of the participants was 43 ($SD=13.56$), and the average household included three members. Participants had lived in the neighborhood for an average of 16.63 years ($SD=17.43$). Several lived in the neighborhood most of their lives or had returned to the neighborhood after living away for a period of time. The majority of participants were women (71.4%). Most participants identified themselves as White/Caucasian (71.4%), followed by Black/African American (19.1%). Nearly 48% had some college education, and 52.4% of participants had an annual income less than US\$24,999. The majority (57.1%) were food-insecure using the USDA-six item scale, and 28.6% participated in SNAP during the previous year. Participants were asked to consider how their household makes food purchasing decisions. Specifically, they were asked to

consider the importance of food quality, price, taste, and whether it was local or organic. A majority of participants (80%) identified price as a concern, which was the most important consideration among both food-secure and food-insecure participants. Fewer than half the participants (40%) considered whether food was locally grown when making a purchase. Those who were food-insecure considered locally grown food at a higher rate (58.3%) than those who were food-secure (12.5%).

Consumer themes. We identified three salient themes from the consumer focus groups: price point, transparency and trust, and communication. Within-group analysis, when comparisons are made by the researcher within focus groups, and between-group analysis, when comparisons are made among focus groups, were employed to extract the three identified themes from the data. Each focus group transcript was analyzed on its own to identify themes within the group. Themes that were present in all groups were then analyzed across the groups to determine which three themes were the most salient.

Price point. The most prominent concept that was raised by consumers was price. Consumer (C) participants referenced favorable aspects of the proposed online food hub; however, their desire to use an online food hub was contingent upon price point. For example, participants spoke about the appeal of the convenience of an online food hub, stating it would save them time that they would typically spend traveling to and from the grocery store, but that the convenience had to be affordable for them to utilize the proposed online platform:

Just the online, you know, is easier than the traveling, you know, type deal, you know, because right now I have my license, but I don't have a car. Cost a lot of money right now. So, getting my produce now and then waiting until I get cab fare to go get the rest is pretty cool. Depending on how much it is. (C14)

While consumers expressed interest in supporting local producers by using the online food

hub, it was only to the extent that the price of product and fees was affordable for them. Four consumers energetically shared their perspectives. C27 stated, "I love to support local, so getting it from central Ohio is cool as long as the price isn't too high." C29 agreed, stating, "That's probably the bottom line: The price." The focus group leader asked, "So what do you think would make you choose a locally produced item over another one?" C21 stated, "Pricing. A lot of it is pricing."

Consumers' concern about price encompasses the price of products, service fees, delivery charges, and ability to use SNAP or WIC for products or delivery. Several times the consumers inquired about delivery fees and shared their experiences with supermarket delivery fees. C13 asked, "What is going to be the delivery charge? Is it worth it for them to deliver it for that price, or for you to just go into the store and do it yourself? That's what you have to really look at." C14 shared, "That's a big deal for me," noting other stores' required minimum purchase for free delivery and the hidden fees associated with online ordering. The importance of price is further evident in an exchange between group members and the interviewer when the interviewer attempted to explore what else the consumers found important when choosing what food to buy. When asked about "other things that are important," C13 simply said, "Coupons," and C20 added, "That would be nice if the farmers market took coupons." Although the consumers did not articulate price as the only important factor, coupons are closely related and were generally desired.

Transparency and trust. A second prominent theme among the focus groups is the desire for transparency and trust of an online food hub. Although consumers mentioned various favorable aspects of an online platform, such as convenience and supporting local producers, being able to trust the producers who grow and supply the product to the food hub was a concern verbalized by several consumers. C19 stated, "Yeah, I mean, because who's running the business, too? They could feed you anything. Seriously." Concerns related to trust evoked somewhat strong objections to the idea of an online platform. Consumers discussed how they like to physically touch the food they purchase to determine its quality. "I suppose if you had to, I'd have to do

it, but I still prefer going to a farmers market and seeing what I'm buying" (C11). They also like to shop for their own food in person, so they can read ingredients and determine if the product meets their dietary needs or preference, including whether it is organic, non-GMO, or meets other dietary preferences.

Skepticism about online portrayal of products was evident. Consumers questioned what would keep an online platform from advertising a higher quality product than what was delivered to them. For example, if they ordered fruit online, they claimed it could be bruised or overripe when they picked it up or it was delivered.

"A lot of people like to see their produce rather than, you know, seeing it on a screen. You want to touch it. I mean, if it's yours, you know you're buying it, I guess. See that the bananas are nice and ripe." (C14)

Trust regarding the delivery method was vocalized as well. Participants questioned if the vehicle delivering the product would have proper refrigeration.

Knowing where and how the food is grown was also important to consumers, including the amount of time it takes the product to make it from harvest to delivery. C20 stated, "*I just want to see how it gets from point A to point B. That's it. If you can show me how that T-bone steak came from this spot and came to me, I'd buy it in a heartbeat.*" C7, whose word choices indicate some level of knowledge about growing produce, shared the need for more information about the use of chemicals on plants and how producers were caring for animals: "*[There is a need for] Best care practices. Like, how do you treat your cows? How do you treat your plants? What are you spraying your plants with?*"

Communication. The third theme observed among consumer focus groups is communication, in terms of participants sharing news, events, and programs. Consumers voiced that they are often unaware of things happening in the neighborhood and mentioned word of mouth and flyers delivered to households as favorable ways to communicate information in the neighborhood. C13 shared:

"I pass it on when I hear it to different people, because with the flyer today, I told my neighbor upstairs, next door, one down the street. It was up to them to come, but I try to pass it on as I get it... A lot of times it's just the people that you're around and you hear a conversation about it, you know."

C14 added:

"I had a lady who I rode the bus with, and she's not from here, but she's been living here for the past 10 years or so, and she said, 'honey, you got to know people in Columbus to find out something.' I say, 'yes, you do.'"

C13 agreed, stating, "Or certain things you will never know."

Discussion

Our research provided the opportunity to learn from the perspectives of small-scale producers and consumers who live in a low-income and low-food access neighborhood as they relate to the potential development of an online food hub. We identified themes from interviews and focus groups and then considered these themes in the context of common frameworks of sustainable agriculture and CFS. Allen (2004) describes the purpose of an AFN as a way sustainable agriculture and CFS align to support farm and food security. The research team continues to consider how producer and consumer perspectives can help determine the best strategies to leverage resources to meet our desire of bringing together sustainable agriculture and CFS values and whether these ideals can be actualized in the region where this project took place. Following, we provide an analysis of the themes that were presented to better understand where potential intersections occur between sustainable agriculture and CFS.

Producers

When MTSO, Seminary Hill Farm, and Franklinton Farms initiated this project, there was an assumption that an online food hub as an AFN would be a win-win for small-scale farmers and residents in the Franklinton neighborhood. While producers we interviewed were interested in sup-

porting low-income consumers in areas where local, fresh, and healthy food options were limited, their primary need related to ensuring the economic viability of their business, which is one component of sustainable agriculture. This was evident through the producers' statements about needing price guarantees and reliable orders. In addition, many expressed a need for creative strategies to retain appropriate pricing for their products, noting that the pricing would not likely be low enough for food-insecure and low-income consumers. Guthman et al.'s (2006) review of CSAs and farmers markets showed similar interest in wanting to address food insecurity and make food more available to low-income consumers, but the bottom line must be considered. Small-scale farms, such as those working with MTSO and Seminary Hill Farm, face challenges to maintaining the viability of their farm business. Producers' sentiments about wanting to provide food to low-income consumers but feeling challenged by their own need to have fair prices for their high-quality products exemplify the intersection of CFS and sustainable agriculture framings, both of which consider social justice and equity as underlying values. When designing this project, we included Seminary Hill Farm and Franklinton Farms in the planning and research process, but we did not have for-profit farms directly involved until the interviewing process. If we had included their voices earlier on, we might have recognized that while the for-profit small-scale farms in our study may share similar values as the Seminary Hill Farm and Franklinton Farms, their mechanism for meeting their financial needs is different than that of nonprofit or higher education institutional-based farms. For-profit farms are influenced more by the market system embedded in a local, regional, national, and international industrialized food system, while Seminary Hill Farm and Franklinton Farms are able to receive grants and foundation support to help subsidize their efforts to provide high quality, organic, local food to their customers. Franklinton Farms, specifically, is able to provide a sliding scale of prices through their farm stand and CSA program in the low-income neighborhood where the study took place because it is a 501(c)(3) and can access certain resources unavailable to for-profit entities. Producers

were frustrated by the reality they faced trying to meet the needs of consumers unable to pay the price for their products. When we think about the sustainable agriculture and CFS values of justice, equity, and fairness, we must consider how we make the system work for all involved when the needs seem to be in opposition to one another. If we had brought one or more of the for-profit farms to the table, our assumptions may have been challenged, or we may have asked ourselves, "Justice and equity for whom? Who decides?"

Since beginning our study, a large volume of research and reliable information has emerged about the economic viability of food hubs, with variations existing within and between localities, states, and regions (e.g., Matson, Thayer, & Shaw, 2016; Rysin & Dunning, 2016). We held a conference at MTSO in November 2018 to share our research, but it is evident that small-scale producers in our study that are not currently connected to others through this aggregation method could benefit from resource-sharing about food hubs. This could include working with national and regional food hub networks (e.g., Ohio and West Virginia Food Hub Network, Michigan Food Hub Learning and Innovation Network, the National Good Food Network's Food Hub Center) that exist to support peer producers by providing education, reaching non-academic audiences through accessible research, helping work through challenges experienced by food hub members, and bridging any divergences between academics studying food hubs and practitioners implementing them (Levkoe et al., 2018; Wallace Center, 2013).

Direct-to-consumer programs that allow the use of SNAP, WIC, and Senior Farmers Market Nutrition Program coupons, and double-up SNAP programs are intended to provide low-income consumers with opportunities to purchase healthy and fresh food, while also providing producers with potentially new customers and subsidies to bridge the gap between the value of the produce being sold and what the customer is able to pay. Some producers in our study shared negative experiences from participating in government programs because payments were often delayed. Guthman et al.'s (2004) study identified similar concerns about any extra time needed to market produce and par-

ticipate in programs like SNAP, although it seemed to be less risky for larger-scale farmers markets or farms with established revenue streams and was easier for nonprofits that could access diversified funding. Community partners working with small-scale farms or food hub networks may be a way to help educate producers about how these programs fit within AFN frameworks with CFS and sustainable agriculture values, as well as provide technical assistance to troubleshoot any challenges they have with government procedures, equipment, or reimbursement processes.

Producers expressed uncertainty about the risks and time, beyond economic aspects, that would be involved with a potential online food hub. Producers noted the amount of time needed to participate in an online food hub in new markets, especially if it meant expanding their operation. The sentiment was expressed that food movements (i.e., food messages in the mass media) constantly shift, and there would be a need to ensure that the supply and demand were in balance. Producers also expressed concerns about any extra time for marketing, as most of them felt limited in their availability to add more to their workload. It is important to consider how community partners like those in this project from private and public higher-education institutions and nonprofit groups might support producers in these endeavors by incorporating for-profit stakeholders into projects, sharing responsibilities for marketing materials, and in the event producers do not have time, serving as liaisons to advocacy groups, food policy councils, and government entities who might support systemic changes representative of sustainable agriculture and CFS values.

In our study, producers expressed a desire and need for a cultural shift in Central Ohio. The small-scale producers in our study met a specific set of requirements in order to provide food for MTSO, aligning with production methods that do not use chemicals and consider stewardship of natural resources in the cultivation of healthy soil as part of MTSO's commitment to ecoteology and sustainability. Producers felt that the food hub project itself may need some additional educational components in order for consumers to understand more about how food is grown, how prices are determined,

how to reduce food waste, and how consumer food purchases ultimately can create greater demand for an improved sustainable regional food system in which people are more connected to the land and farmers.

Many producers in our study described the need to provide low-income consumers with education about the potential benefits of local and organic food and farming practices. It is unclear whether this was due to producers' beliefs about low-income consumers lacking adequate information, having limited access to information, or having conflicting or untrustworthy information that could inform and promote purchasing behaviors favoring local and/or organic food (Wunderlich, Gatto, & Smoller, 2018). While it is beyond the scope of this article to discuss the wide range of research regarding the purported health and environmental benefits of local and organic food, and what even constitutes "local" or "organic" food in the first place (Allen & Hinrichs, 2007; Schnell, 2013), we know consumers from all socioeconomic backgrounds are exposed to food marketing messages that can sometimes be considered value-laden, confusing, politically motivated, and contradictory (Allen & Hinrichs, 2007; Kareklas, Carlson, & Muehling, 2014; Nestle, 2007; Wunderlich et al., 2018).

Low-income consumers are exposed to mass media food marketing and targeted healthy food messaging to those at high risk for chronic diet-related diseases, but often have to weigh other considerations about food purchasing, such as the availability, affordability, and accessibility of local and/or organic food options (Rodman, Palmer, Zachary, Hopkins, & Surkan, 2014). Byker, Rose, and Serrano (2010) recommend the use of several education and outreach "demand-side strategies" that are based on their study of participants who followed a local food diet. They describe the need for a variety of messaging that is for subgroups of people with different demographic characteristics that could be potential customers (e.g., seniors, immigrants). Education strategies include providing information about "food handling and proper storage," encouraging involvement by multiple family members during meal preparation, incorporating information about "balanced meals using seasonal

products” in local food guides, and shifting cultural views on local food to describe it as a normal standard of consumption, not an “alternative” way of eating (Byker et al., 2010, p. 134). Other outreach activities suggested include “neighborhood canning parties,” potlucks, sharing family recipes through local media sources, encouraging “one-day or one-week local food diet challenges,” and having more food-based celebrations in communities (Byker et al., 2010, p. 134).

Future research could focus on having low-income consumers identify where they have learned about local and/or organic food, analyzing food marketing messages provided by local, state, and federal AFN programs, and analyzing the sources and the quality of sources of food messaging targeted to low-income consumers or those living in low-income communities. These efforts could inform how a food hub might include producer-suggested educational components that would be effective, impactful, and informative.

Producers in this study were interested in hearing consumers’ perspectives as a way to bridge their gaps in understanding, since most did not have relationships with low-income communities and markets. Producers valued learning about how low-income consumers made their decisions around food, in addition to consumers’ interest in purchasing local foods. Producers were proud of the quality of their food and want a way to showcase this food to their low-income neighbors, if there could be ways to overcome the risks and barriers to marketing, pricing, and food access. Their concerns beg the question about who bears responsibility for ensuring healthy food access, especially for producers interested in creating AFNs that incorporate the ideals of sustainable agriculture and CFS.

Consumers

Price, transparency and trust, and communication were the three prominent themes that emerged from our consumer focus groups. These themes reflect those of transparency, democracy, equity, and access that Berti and Mulligan (2016) identify as necessary to foster connections between producers and consumers and uphold the alternativeness of local food systems. We unexpectedly recognized

that the interviews with small-scale producers, the focus groups conducted with residents, and the research team meetings between all groups involved were important aspects of building relationships and using inclusive processes that themselves build transparency and trust, which are important goals of local food movements (Allen, 2010) and underscore CFS practices (Pothukuchi et al., 2002; Winne, 2004). As the team moves forward and considers the feasibility of an online food hub, including producers and consumers in other processes will be important. This may include having producers come to the neighborhood for a farm day event in coordination with Franklinton Farms or finding ways for residents to meet and/or visit local producers as a way to build trust for food products and address any assumptions producers have about residents’ interest or needs.

Overall, focus group participants, who were overwhelmingly food-insecure, desire high-quality food at an affordable price. CFS strategies intend to address the need for improved access to quality, healthy foods, recognizing that price is a common barrier (Pothukuchi et al., 2002; Winne, 2004). AFNs operate as market-based endeavors, and small-scale producers have little room to negotiate prices. While producers expressed the need to educate consumers about their products and how pricing is determined, the same issue exists in regards to communicating that low-income consumers have a set amount each month to spend on food. Despite the CFS ideals of economic and social justice for all people within the food system (Hamm & Bellows, 2002), most households were concerned about their own family’s financial well-being. It was clear that prices for food through the proposed online food hub would need to be similar to what they pay at supermarkets and other food retailers where they shop.

Consumers desired high-quality produce and expressed their trust of certain supermarkets where they shopped, although many shared that they would buy more fresh items if there were markets available in the neighborhood. While some wanted very specific transparency in regard to pinpointing their food source, others preferred to not have access to that information. Interestingly, some focus group conversations moved back and forth be-

tween the desire for food that had limited additives or for food that was grown without chemicals to statements about regularly eating frozen pizzas and fast food. We interpreted this to mean that a social bias may have occurred or that transparency had multiple meanings. Ideals of quality were related to either consistency and trust experienced with certain brands or stores or through handling foods directly and being able to see, smell, and touch the food items. Researchers have noted similar consumer concerns about food quality at farmers markets, such as rotten produce, presence of bugs, and uncertainty about where food was grown (Di Noia et al., 2017).

One theme that emerged, but was unexpected, among the consumer focus groups was a sense of camaraderie. The focus groups, in addition to serving as a chance for the researchers to learn from the consumers and for the consumers to share their thoughts about local food, served as a communal space to share conversation and information with fellow residents. Although the residents expressed their thoughts about local food and the possibility of an online food hub, they seemed to enjoy the company of other residents, some they had never met before. The presence of camaraderie and the meeting of neighbors in our study is an unexpected positive outcome and demonstrates that including residents in local food conversation can foster a sense of community (Allen, 2010) in addition to discussing food issues. Food hub viability research suggests the importance of community outreach and educational activities about the potential impacts of local food purchasing and how to use local ingredients (LeBlanc, Conner, McRae, & Darby, 2013). However, small-scale producers in our study seem hard-pressed for time to lead these efforts. It is important to find community partners who are focused on complementary services that would support producers' efforts and would be recognized as trustworthy and welcoming organizations, agencies, or spaces by residents in those communities. In the community where the study took place, such partnerships have resulted in hosting cooking demonstrations at neighborhood events, using local ingredients donated from Franklinton Farms at free community meals and soup kitchens, providing cooking classes using ingredi-

ents from Franklinton Farms and the neighborhood food pantry, bringing children to Franklinton Farms to learn about food, hosting free neighborhood festivals that incorporate local and organic food into the food that is served, and working with OSU to educate families with young children in the community about growing food, preparing meals, and celebrating together through shared meals. As we move forward, we recognize how important it is to pay attention to the community's modes of communication, as other AFN programs have suffered because of lack of awareness or advertising (Colasanti et al., 2010; Freedman et al., 2016).

Meeting the Needs of Producers and Consumers

We hypothesized that producers would be oriented toward the economic viability of their small-scale operations and that consumers would be oriented toward improved food access that was convenient and affordable. Our findings suggest confirmation of these sentiments, but the underlying values of producers and consumers are imperfect and intersect along sustainable agriculture and CFS frameworks. Both groups were interested in supporting their community, although there were realistic challenges expressed in terms of logistics like price, delivery, and scale. Consumers did not seem to have a strong sense of what products could be produced or available locally, and producers seemed to have limited experience or knowledge about low-income consumers. Using a CFS framework would require a greater effort by producers, consumers, and the research team to build relationships; Feenstra (2002) refers to this as developing social spaces where people can come together to communicate with one another and build capital. Similar to Hinrichs' (2000) findings, producers and consumers must consider different needs and priorities related to prices and costs with AFNs that focus on relationships.

While producers favored organic and sustainable farming practices, this was not of high interest to consumers. It is unclear if there is an educational gap about what organic means, as expressed by some producers, or if it is the perception of organic and/or local food as more expensive and unattainable. Consumers discussed food more in terms of safety, which is an important aspect of

CFS strategies that focus on environmental and public health (Winne, 2004). This is where messaging is important. Producers also described the potential for this project to launch others and change the food system. In order for AFNs to fulfill their purpose, Hoey and Sponseller (2018) stated that independent food projects will need to spark the emergence of other independent food projects, and the collective presence of these food projects will bring about structural change to the food system.

Consideration has been given to how to appropriately scale-up AFNs to be more impactful and to counteract the harmful effects of the unsustainable, conventional food system. Scaling up must be done appropriately and at a pace that does not detract the authenticity and underlying values of AFNs (Berti & Mulligan, 2016); otherwise, AFNs risk furthering injustice and inequity, the antithesis of CFS and sustainable agriculture values. Berti and Mulligan (2016) identify three main challenges that need to be met when scaling up: (1) Not compromising quality for consumers by providing a consistent and appropriate quantity of food; (2) Making available a variety of products; and (3) Making healthy and fresh food accessible and convenient to consumers, with regard for low-income populations.

Conclusion

Our project explored scaling up the AFN presence in a low-income neighborhood by seeking input from producers and consumers on the feasibility of an online food hub. We were able to identify the presence of values associated with sustainable agriculture and CFS. The information and insight provided by the producers and consumers was invaluable in determining that an online food hub is something that appealed to some producers and consumers for several reasons, but also that overall the barriers identified by both producers and consumers were more prominent than the benefits, and the desire for the proposed online food hub was not sufficient to move forward with a full-scale online food hub at the time. Had the producers and consumers not been involved in our process of exploration, it could have been assumed that simply by creating an online food system available to a predominately low-income neighborhood, jus-

tice would have been served, when in reality this is not the case. Low-income individuals often are not aware of things happening in their own neighborhoods, as evidenced by the communication consumer theme we identified. Therefore, specific outreach to this population when considering alternative food projects is indispensable. On the other hand, small-scale producers must keep in mind the ability for their farming businesses to be financially stable and sustainable, so more planning is needed to ensure the economic feasibility of an online food hub. Without the considerations for consumers and producers, food scholars and activists will continue, while likely unintentionally, to perpetuate the injustices they seek to eliminate within our food system.


Addendum

In early March 2020, Ohio businesses began shutting down due to the COVID-19 pandemic. This included the farmers market where Franklinton Farms sold produce weekly. Within 24 hours of notification of the closure, the nonprofit farm team determined that the financial loss of the closed market and the potential loss of crops ready to harvest for consumers would be devastating without shifting to an alternative model to stay in business, as they were also in between CSA seasons and CSA revenue. On April 28, 2020, the research team spoke with Rebecca Brown, one of the co-executive directors, for an update. The farm created an online ordering system using the Square platform, worked with a volunteer living in the area where the market was generally held to host a curbside pick-up on her porch, and created a similar curbside pick-up system of orders in the Franklinton neighborhood at one of their rehabbed farm houses. The farmers market then developed a spreadsheet of farmers and ways to order their food and created a curbside pick-up at a community center. Franklinton Farms is maintaining orders for both locations, accepts SNAP, Produce Perks, and discounts its produce for people living in their low-income community. At this time, it has doubled its distribution income for the same time last year, with 50 households from Franklinton and 350 customers outside of Franklinton purchasing food. Most of the advertising has been through so-

cial media and emails to people who have participated with Franklinton Farms. The online ordering system allows for people to pay for others' produce, which is the third highest grossing item. Franklinton Farms works with a local pantry and distributes the produce to low-income individuals each week.

Franklinton Farms has also worked with three individuals (two live in the community, one works there) to provide additional items for sale through its site (including sustainably harvested ramps, jams, flowers), with non-Franklinton Farms producers receiving 70% of the sales. Rebecca expressed a willingness to work with other producers in the community, as long as they are able to provide 50%–75% off their product. They are hoping to increase sales to persons using SNAP, but they had nine such customers in the third week of April 2020. While Rebecca was unsure of the level of need in the neighborhood, a different food pantry in the neighborhood is seeing an increased need, requesting donations so they can purchase three times as much product from the food bank.

Seminary Hill Farm launched an early-bird version of its CSA program through an online weekly ordering system, with customers able to choose items and pick up themselves at the farm on the campus of Methodist Theological School in Ohio. Other farmers in the study have participated in webinars and Zoom calls with the Ohio Ecological

Food and Farm Association, receiving support from their networks to build online platforms, troubleshoot issues, and understand legislation related to COVID-19. Many are part of two farmers markets in the area that are providing curbside pick-up through online pre-orders, and some are participating in a few local food distribution businesses. It is unknown what the impact of institutional and restaurant closures have had and will continue to have on the farms. 

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Comparing apples and coconuts: Food regimes and (farmers) markets in Brooklyn, USA, and Suva, Fiji

FoodDignity

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Abstract

Until the advent and spread of supermarkets, the markets that we now call farmers, public, open-air, or traditional markets needed no adjectives. They were simply markets. Currently, the bodies of research about traditional markets common in the Global South and about farmers markets resurging in the Global North tend to be separate. However,

viewed through the lens of food regime frameworks, together these markets come more clearly into focus as globally local alternatives to a corporate regime of supermarkets. As microcases within this macrosociological framework, this paper examines two urban markets—one traditional daily market in Suva, Fiji, and one seasonal Saturday farmers market in East New York, Brooklyn, in the United States. We analyze interviews and surveys with vendors and market-related documents. As we illustrate with brief case descriptions, other than both being urban, the individual markets and their contexts could hardly be more different. One

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market was formalized early in the colonial food regime, and the other was founded more recently as an alternative to the current neoliberal corporate regime. However, vendors in both reported that selling at the market generates income, autonomy, respect, and social connectedness for them. These commonalities suggest that examining lessons from such markets across communities globally, South or North, traditional or farmers, may offer new insights into how to sustain and expand such markets even in the face of supermarket domination. In addition, doing so with a food regime lens may make that work more useful for informing how to support traditional and farmers market development in ways that help keep aspirations and needs of those who produce, distribute, and consume food at the heart of their work, as real alternatives to neoliberal frameworks.

Keywords

Farmers Markets, Traditional Markets, East New York Farms, Supermarkets, Food Regimes, Food Sovereignty, Food Dignity, Suva Municipal Market, Partners to Improve Markets, Fiji

Introduction

The bodies of research literature regarding “traditional markets” that still predominate in most of the Global South and “farmers markets” resurging in the Anglophone North rarely overlap (Cody, 2015a). However, wherever they lie on the compass, such markets enable food producers and preparers to sell their products directly to those who will eat it.¹ Viewing Southern and Northern markets in a common frame, rather than separately, yields insights into the local and global functions that such markets can and do play. In turn, this knowledge can inform efforts to sustain and grow the contributions of these markets to achieving social goals such as economic and community development, environmental sustainability, food sovereignty, and equity.

This paper begins that project with a historical

review of the evolution of markets and with case studies that characterize and compare two urban markets—one in the Global South and one in the Global North. One of the cases is the daily and year-round Suva Municipal Market, located in the capital city of Fiji (a subtropical island nation located in the South Pacific). The other is the East New York Farmers Market, which is held each Saturday in the summer and fall in Brooklyn, New York City, U.S. As we outline here, these two markets seemingly have little in common beyond both being urban markets where eaters can buy food directly from producers and preparers. Thus, any similarities in food system roles found between them may shed light on the roles that urban markets—whether traditional or farmers, in the Global South or North—can and do play in world food regimes. In this paper, we examine both markets at the microcase level to explore what traditional markets of the Global South and farmers markets of the Global North might have in common. In particular we analyze the markets from the standpoint of vendors.

Markets and Food Regimes

In the late 1980s, Harriet Friedmann and Philip McMichael introduced their food regimes framework (1989), which characterizes global operations of power as manifested in food systems. As McMichael explains in later work, the food regime concept provides a historical lens that is “not about food per se, but about the relations within which food is produced, and through which capitalism is produced and reproduced” (2009b, para. 1). In their 1989 paper, they identified two, sequential regimes. The first was a *colonial food regime*, which dominated from 1870 until the first World War. This regime is characterized by colonizing nation-states (especially the United Kingdom) feeding their second industrial revolution laborers with calories extracted from territories they had colonized (e.g., India and Fiji). In four of these colonized territories—the U.S., Canada, Australia, and New

¹ A “market” in the Global South encompasses what are called farmers or public markets in the Global North. Though these market types differ in some important political and micro-economic ways (see, e.g., Kurland & Aleci, 2015), we are collapsing them for the macrolevel regime analysis in this paper as a geographic location and economic institution where producers or preparers can sell their products directly to consumers, even if this is not the exclusive or even dominant activity at the market.

Zealand—invaders eventually dominated Indigenous peoples politically and in sheer population numbers. These eventually became “settler” or “new world” states (although the word “settler” obscures the genocidal tactics used by colonizers). Increasingly larger scales of commercial, family-governed farming began to dominate food production in these settler states. The word “markets” in this period denoted what are now usually specified today as “traditional” markets in the Global South or “farmers” markets in the Global North.

Over the course of two world wars and the waning of formal empires, a new regime emerged by 1947. In this second regime, commercial farms merged with other forms of industry to form evermore-integrated relations. Friedmann and McMichael characterize this period as the *industrial food regime* of 1947–1973 (Friedmann, 2005; Friedmann & McMichael, 1989). This era was marked by the industrialization of production in the green revolution, rapid growth in heavily processed food, and the development project of delivering politically driven food aid to formerly colonized states. This industrial scale of agriculture was designed to feed a nascent global food supply chain, as opposed to peasant and midscale farming used to feed people locally and regionally (McMichael, 2009b). Commodity agriculture emerged in settler and colonizing nations, and a new kind of market—the “super” market—spread as well.

Today, Friedmann, McMichael, and others have increasingly characterized the current, third food regime as the *corporate food regime* (Burch & Lawrence, 2009; McMichael, 2005). In this neoliberal third regime, national and multinational agri-food corporations have enrolled state powers, farmers, and financial systems (“financialization”) in enabling for-profit, private-sector domination of food systems globally. This includes international investments in agricultural land, otherwise known as land grabs from a food sovereignty perspective (McMichael, 2012). The spread of supermarkets in the Global South and their consolidating supply chain powers everywhere are also key markers and drivers of this corporate regime (Reardon, Timmer, Barrett, & Berdegué, 2003). As two agri-food supply chain experts note, through a food regimes lens, “supermarkets are among the most powerful

transnational corporate forces in the world today and have a significant impact on the lives of increasing numbers of producers and consumers across the globe” (Burch & Lawrence, 2007, p. 1).

In this food regimes framework, traditional markets in the Global South that still dominate the fresh grocery trade can be seen as hold-outs from earlier regimes, and even from before the colonial regime (e.g., one scholar describes such markets as a “pre-capitalist device” [Hodges, 1988]). In places where traditional markets still dominate, supermarket corporations target them to take over their grocery shares (see, e.g., Economist staff, 2014; Paarlberg, 2013; Trefis Team & Great Speculations, 2014). In the Global North, where farmers markets are hardly visible in terms of grocery sales, such markets comprise a growing resistance to the corporate food regime and, often, an explicit alternative to the dominant food system (Alkon, 2007; Gillespie, Hilchey, Hinrichs, & Feenstra, 2007; Kirwan, 2004; Spilková, Fendrychová, & Syrovátková, 2013).

For those who propose a radically democratic food system as envisioned in the food sovereignty movement, farmers markets and traditional markets can be viewed collectively as alternatives and resistance to a corporate food regime. They could be, and often aspire intentionally to be, part of a food system that “puts the aspirations and needs of those who produce, distribute, and consume food at the heart of food systems and policies rather than the demands of markets and corporations” (Forum for Food Sovereignty, 2007, para. 3). In the context of this macrolevel sociological framework of food regimes and the current corporate regime’s “supermarket revolution” (Reardon et al., 2003), we explore, at the micro-case level, what vendor experiences at urban markets of the Global South and Global North have in common.

Methods

Through the macrolens of food regimes, we compare and contrast cases of two urban markets: a large, daily market in Suva, the capital city of Fiji, and a small Saturday market in the East New York neighborhood of Brooklyn, New York, in the U.S. We start by tracing the trajectory of such markets and supermarkets in each country, then character-

ize the context and operations of each market, and then focus on the vendors' perspectives on the role of the markets in their lives and communities.

Study Background

The two market cases presented here are each a small part of two independent and much larger research endeavors. The Suva case derives from a subset of results from the larger United Nations Women's Partners to Improve Markets (PIM) assessment and action project. The East New York market case is a subset of research with the market's organizers and hosts, East New York Farms! (ENYF). ENYF was one of five community partners in a five-year action research project about community food systems called Food Dignity. The first two authors were part of the Food Dignity team. In addition, Porter patronized the Suva and other Fijian markets when living in Fiji for four years in the mid-1990s. Upadhyaya served on the Fiji-based team of the PIM project.

Data Sources

To outline the history and context for these markets, we reviewed primary sources (e.g., market websites and media coverage), grey literature, and peer-reviewed literature. Three sources of data informed our case study research about the current work of each market: vendor surveys, vendor interviews, and primary documents and reports (see Table 1). Our analysis is also informed by having

spent time at these markets as patrons and as researchers.

Surveys

Vendor surveys have been conducted at each market. In 2013, the PIM project in Fiji included a survey of 101 vendors at the Suva Municipal Market to gather information on what people sell, how much they make, and how much they work at the market. Of these 101, results for the 28 survey respondents who indicated that they grow or prepare at least some of what they sell and reported gross income from the previous weekend's market were analyzed for this paper. (Note that survey participants were not necessarily the same people who participated in interviews.)

In East New York, ENYF staff compile data from vendors about their sales each market day. Results in this paper include analysis of per-vendor and per-market data from the combined 2011 and 2012 seasons from de-identified data that ENYF shared with the authors.

Interviews

The interviews with vendors at each of the two markets were conducted as part of the larger PIM and ENYF and Food Dignity research projects. For this paper, we reanalyzed them with a focus on vendor perspectives on each market. All interviews were recorded and transcribed.

At the Suva Municipal Market, Upadhyaya

Table 1. Summary of the Three Data Types that Informed Our Case Studies

Data Source	Market	
	Suva Municipal Market	East New York Farmers Market
Vendor surveys	Survey of 28 vendors, conducted as part of the United Nation Women's PIM project	Data compiled by ENYF staff about vendor sales each market day ($n=24$ vendors in 2011; $n=20$ vendors in 2012)
Vendor interviews	Interviews of 40 vendors, also conducted as part of the PIM project	Interviews of 4 East New York market vendors, conducted as part of the Food Dignity project
Primary documents and reports	Reports prepared for the PIM project: <ul style="list-style-type: none"> ▪ UN Women, 2009 ▪ PIM, 2010 ▪ UN Women, 2011 	<ul style="list-style-type: none"> ▪ ENYF website (Daftary-Steel & Gervais, 2015; ENYF, n.d., 2016) ▪ Internal market-related documents from ENYF ▪ A report by the former director of ENYF for Food Dignity (Daftary-Steel, 2014) ▪ The New York State's Division of Minority and Women's Business Development's survey of one East New York Farmers Market vendor

worked as a team with a mentoring colleague to interview 96 vendors over three months in mid-2013. Overall, the busiest market day, Saturday, may have up to 3,500 vendors (see Table 2). As part of the larger PIM project, the researchers' purpose was gathering recommendations from vendors about how to run the market. These interviews, which lasted an average of 25 minutes, were recorded and transcribed. With the emphasis on markets as alternatives or resistance to a corporate food regime in this research, we focused on a subset of vendors who indicated they grew or prepared any portions of the items they sold. In our interview sample, a total of 40 interviewed vendors (out of 96, or 41%) met this criterion. Of these, 38 were Fijian-speaking (iTaukei), and two were Hindi-speaking (Indo-Fijian). Only one of the vendors interviewed who produced his own food (Fijian-speaking) was male, which reflects the general dominance of women (87%) as Fijian market vendors (PIM, 2011).

Interviews with four East New York market vendors were conducted over the past four years as part of the documenting of ENYF work under the case study research of the Food Dignity action research collaboration. Each Saturday market generally has 13–19 vendors, out of the 20 to 24 who regularly sell there over the course of a season. All food vendors at the ENYF market sell at least some food they have prepared or grown themselves. Two of the four interviews are vendors interviewing one other, one was conducted by Porter, and the fourth by another Food Dignity academic partner. Three vendors were women. All four were people of color and residents of the East New York neighborhood. Although we recorded interviews with fewer vendors in East New York than in Suva, the first two authors conducted collaborative case study work with the East New York market's host organization (ENYF), adding to the rigor of our analysis. Additionally, the East New York sample of four out of the more than 20 total seasonal vendors represents a much higher proportion of the target population than our Suva sample (40 out of thousands of vendors).

Primary documents and reports about the markets and their contexts

Reports and documents about each market and its

context formed the third source of data for this research. For the Suva market, this included reports created for PIM, including ones with the involvement of the third author and, especially, her mentor and colleague Susan Dewey (PIM, 2010; UN Women, 2009, 2011). For the East New York Farmers Market, this included information published on the host organization's website (Daftary-Steel & Gervais, 2015; ENYF, n.d., 2016), market-related documents that ENYF shared with the authors, and a report by the former director of ENYF for Food Dignity about building a farmers market (Daftary-Steel, 2014). In addition, we examined results from the New York State's Division of Minority and Women's Business Development's interview-style survey of one East New York Farmers Market vendor.

Analysis

We drew heavily from the survey and document data to characterize each market quantitatively and qualitatively in the brief case studies below. The findings on what the studied markets do for vendors derive from our coding of the transcripts of interviews with vendors who produce or prepare at least part of what they sell (ATLAS.ti GmbH, 2008). Porter and Gaechter open-coded the interview transcripts for benefits and challenges about selling at the market, about growing or making what they sell, and about the relevance of the market overall in their communities. Many of the emergent themes helped to answer the question, "what do markets do," and we conducted a second round of coding focused more narrowly on this question. We then analyzed these coded excerpts from the interview transcripts, yielding the themes outlined in the second results section below.

Limitations

In addition to the low interview sample size at the East New York market and the small percentage of total vendors interviewed in Suva, as noted above, this study contains other notable limitations. Using our case-study approach to examine similarities and differences between urban markets in two otherwise very different global contexts means our findings are not generalizable. However, situating this work within extensive author experience with these

markets, related research, and the larger food regimes framework partially ameliorates these issues.

We only investigate the value of the studied markets from the perspective of vendors and do not include any qualitative data from market patrons nor quantitative data such as pricing. Also, our paper specifically examines urban markets and does not compare or contrast the related findings to rural markets, which likely offer unique benefits and challenges to their vendors.

In interviews with East New York market vendors, it was not always possible to determine whether a vendor attributed a given benefit to the market itself or to other aspects of ENYF activities. This is a limitation of our study, but also reflective of Global North farmers markets often being part of an intentional food movement, as resistance to the third regime.

Finally, this research largely aims to locate the role and relevance of markets such as these within food regimes, and specifically within a corporate regime. Thus, it focuses more on aspects of vending that seem most likely to be transferable (though not generalizable), rather than on granular policies and practices about how each market might improve vendor or shopper experiences.

Results

Markets in Fiji and the U.S.: Traditional, Farmers, and Super

In the U.S., the word “marketing” used to mean going to market, for both buyers and sellers. The market denoted a destination that, in the Anglophone Global North, is now usually called a “farmers market”. The descriptive word “farmers” was not required until the spread of another sort of market, the supermarket. Some scholars identify the first supermarket as the King Kullen store that opened in 1930 in New York City (Burch &

Lawrence, 2007). Others grant this distinction to a Piggly Wiggly store that opened in 1916 in Memphis, Tennessee. That was the first self-serve grocery store, where shoppers could gather items themselves from shelving rather than providing a list to staff (Marnell, 1971). Either way, by 1960, supermarkets were selling 70% of groceries in the U.S. (MacFadyen, 1985) and making similar inroads in other settler and European countries.

In the Global South traditional markets remained the primary venue for fresh food trading until at least the 1990s (e.g., Kelly, Seubsman, Banwell, Dixon, & Sleight, 2015). In many countries, such as India (Economist staff, 2014; Reardon et al., 2003) and Ghana (Kantar Worldpanel, 2017), they still dominate grocery retail today. Traditional markets are open most or all days of the week. They sell not only locally grown and produced products, but often other goods, including dry groceries and household supplies. They also often serve as storefronts for resellers in addition to enabling people to sell wares they produce or prepare themselves.²

In Fiji today, the split of grocery shares between traditional and supermarkets lies in between the extremes of India, where traditional markets dominate, and the U.S., where supermarkets do. Today, for its population of fewer than 850,000 people spread over 100 islands, Fiji has at least 70 supermarket locations representing six corporate chains (Schultz, 2004). At the same time, as one tourist guide accurately observes, “no matter where you go in Fiji, you will see locals with their roadside stalls selling produce. Prices are extremely cheap, and much of the produce is sold in bunches. Every town of any size also has a market, which is a hub for the local community to come and sell their produce” (Fiji Budget Vacations, n.d., “Fruit and vegetables,” para. 14). We estimate that Fiji has at

² The distinction between traditional markets in the Global South and farmers markets in the Global North made in this paper is not a complete one. For example, some of the oldest markets in the U.S. still identify simply as “markets,” or as “public markets,” and bear some similarities to, for example, the Suva Municipal Market in Fiji. The oldest formal market founded by colonizers of the U.S. began in 1693, established earlier than the nation it now calls home. This is the Reading Terminal Market in Philadelphia, which today is open seven days a week. Baltimore has been home to Lexington Market since 1782 (notably, this market also sold enslaved people), now open six days a week. Boston still has Haymarket, formally founded in 1830 and serving as an informal market location for about a hundred years before that. Today, Haymarket now opens just twice a week, which is similar to how most farmers markets operate in the U.S.

least 21 markets³ to their estimated 70 supermarkets, or a ratio of 30 markets for every 100 supermarkets.

A recent study sheds detailed light on food shopping habits and expenditures in Fiji's two largest cities, Suva and Nadi (Johns, Lyon, Stringer, & Umberger, 2017). Based on a stratified random sample of 1,000 residents in the two cities, the team found that supermarkets take 54% of the urban food dollar, the main markets garner 28%, roadside stalls 6%, and the fish market 4%. Consumers spend 69% of their fruit and vegetable dollars at the main markets. These proportions were remarkably consistent across income levels. No consumer good expenditure data is available for shoppers in rural areas and smaller cities and towns in Fiji. Our anecdotal observation suggests that markets, together with roadside stands, may encompass even more of rural grocery market sales of fresh foods.

By contrast, shoppers in the U.S. spend about 9% of their grocery dollar at “nonstores,” a category that lumps sales at farmers market and stands together with mail order and wholesale food purchases (U.S. Department of Agriculture, Economic Research Service, 2014). That said, the number of farmers markets in the U.S. has quadrupled over the past 20 years, far exceeding the growth of supermarket locations. In 1994, the U.S. had seven farmers markets for every 100 supermarkets (1,755 vs. 24,600). By 2014 the ratio was 22 to 100, with 8,268 farmers markets (Low et al., 2015) and 37,716 supermarkets (Statista, 2014).

Introducing Each Market

Suva Municipal Market in Suva, Fiji

Suva is Fiji's capital city, home to about 85,000 people. The country overall is home to 837,271 people, over half of whom are native Fijian, or iTaukei, and about a third of whom are Indo-Fijian

(i.e., of Indian descent) (Fiji Bureau of Statistics, n.d.). The Indo-Fijian population is a legacy of Britain's colonization of the islands in 1874. The British rulers brought indentured laborers from colonized India to work on Fijian sugar cane plantations. Fiji regained independence in 1970.

The Suva Municipal Market was established in 1891 during colonial rule. It was originally named the Queen Victoria Jubilee Memorial Native Market to formalize the street trading of produce in Suva. The market has been in its current location as Suva Municipal Market since 1950. It is Fiji's largest market.

The market is open six days a week, Monday to Saturday, starting at 6 am. Shoppers can fulfill nearly all of their grocery needs there, and produce prices are generally lower than at supermarkets. A popular travel guide for tourists calls this market “the beating heart of Suva” (Lonely Planet, n.d., para. 1). Suva City Council, which manages the markets, says, “it is not only Suva's major food supplier and a means of livelihood for thousands of people, but is also a celebration—a six-day fair” (Suva City Council, n.d., para. 1).

Most of the market's vendors are hosted inside a hexagonal, two-story building and a neighboring rectangular produce hall. It is next to the busy bus station and steps away from the Suva Wharf. The market accommodates about 2,400 vendors, with up to 3,500 on the busiest days, including people selling from sidewalks and stalls outside (Dewey, 2011; Suva City Council, n.d.). The city employs a market master who oversees two supervisors and eight attendants to run the market. A cleaning crew comes on Sundays, which is the only day the market is closed.

Vendors selling upstairs in the hexagonal building offer mostly dry products such as spices, onions, garlic, and kava root (*yagona*), which is used in indigenous Fijian ceremonies as well as recreationally. Traders on the market's ground floor, in

³ Based on available PIM reports, web searches, and our personal experience, Fiji markets include (with location if not indicated by the market name): Bailey Bridge (Nasinu), Flagstaff (Suva), Labasa, Lautoka, Nabowalu (Bua), Nadi, Nausori, Ratu Dovi Roadside (Nasinu), Sigatoka, Southpoint (Nakasi), Suva, Vaileka (Raki Raki), Tavua, Savusavu, Korovu, Ba, Seaqaqa, Nabowalu, Navua, Korolevu, and Levuka. Of these, at least 13 are municipal markets (PIM, 2011). This excludes informal sales that many producers and gatherers make directly to consumers via roadside stalls, sidewalk offerings, and individual solicitation (e.g., door-to-door and rural women flagging down buses travelling long-distance routes, which stop to allow passengers to purchase palm-frond baskets full of foraged fruits in season).

the produce hall, and outside sell an enormous variety of fresh vegetables and fruit, both local and imported, along with some prepared foods catering to the needs of an ethnolinguistically diverse population. There is also a neighboring fish market, which is managed separately and not included in this study. Many vendors travel long distances over rough roads or by boat from outer islands to sell their own and their communities' produce at the market (Dewey, 2011). As noted above, the Suva market supplies nearly 70% of the fruits and vegetables that Suva city residents buy, in dollar value (Johns et al., 2017). Among market vendors who were surveyed in this study (see Table 2), their gross intakes on a Friday and Saturday market day averaged just over US\$50 a day. Amounts ranged

from US\$9 to US\$250 per day. (For reference, Fiji's minimum wage is currently FJ\$2.68/hour, or US\$1.22. The U.S. minimum wage at the time of this research is US\$7.25/hour.)

East New York Farmers Market

East New York is a neighborhood in the borough of Brooklyn, in New York City, New York, U.S. This area was also colonized by Europeans, but centuries earlier than Fiji was, first by the Dutch and later by the British. Today, the neighborhood's population is roughly double that of Suva's. The neighborhood is about half African American or Afro-Caribbean and about 40% Latinx. First-generation immigrants compose one-third of the population (NYCStat Stimulus Tracker, 2015).

Table 2. Descriptive Summary of Two Community Contexts and Their Markets

Characteristic	Suva, Fiji	East New York, Brooklyn, U.S.
Community Population	85,000 residents	174,000 residents
Dominant Community Demographics	56% iTaukei (native Fijian) 37% Indo-Fijian	50% Black 40% Hispanic 33% 1 st generation immigrants
Management	Local government: Suva City Council. The market generates net revenue for the city.	Community-based organization: ENYF. Revenue covers ~23% of operational costs (Daftary-Steel, 2014).
Market Days	Monday–Saturday, all year	Saturdays for 21–23 weeks in season, plus a Wednesday produce stand
Average vendor revenue on a Saturday, ^a in US\$ ^b (and revenue range).	\$51 (range: \$9–\$250)	\$381 (range: \$24–\$2,891)
Total market sales, annual, in US\$ ^b	~\$8,340,000 in 2009	\$118,049 (average 2009–2013)
Vendor fee per day, per table, in US\$ ^b	~\$1.50 (table and shelter provided if indoors; many rent more than one table)	\$6–\$18 (plus \$2–\$10 optional table and tent rental)
Number of vendors, Saturdays	2,400–3,500	About 24
Number of customers, Saturday average	Unknown	About 1,500
Year founded	Formalized by colonizers in 1891 (in current location since 1950)	1998
Venue	~6,690m ² in a two-story building and a produce shed, ^c plus outdoors	Open-air on a temporarily closed block of a city street

^a Fiji data from 2013 survey results from 28 vendors who indicated they sell food they produced or prepared and reported earnings for previous Friday and Saturday combined, divided here by two to provide a one-day estimate. East New York data from combined 2011 and 2012 individual vendor reports gathered by ENYF at each market. This calculation counts gardeners as one vendor, excludes data for three vendors who sold only on one market day in a season, and adjusts for actual days each vendor sold at the market (out of 21 possible market days each season in those years).

^b Calculated with an exchange rate of US\$1=2 Fiji dollars

^c Author calculations based on estimates from satellite images. For reference, the median supermarket area in the U.S. is about 4,300m² (Food Marketing Institute, n.d.).

The East New York Farmers Market was founded in 1998 by a neighborhood not-for-profit organization, the ENYF project of United Community Centers, in collaboration with residents in the neighborhood. During neighborhood community meetings in the mid-1990s, East New York residents articulated the need for better retail access to food and better opportunities for youth. The ENYF project was founded in response, including a farmers market that drew on local assets of more than 65 community gardens.

The market operates every Saturday in season, from June to November, and is open from 9 am to 3 pm. ENYF also operates a farm stall on Wednesday afternoons.

The founding goals of the East New York Farmers Market were threefold. One was to provide residents who otherwise do not have easy access to fresh and affordable or culturally relevant foods, with convenient access to these items. They began with the Saturday market and later expanded to offer a Wednesday farm stand. These limited hours cannot compare to the 24-hour convenience of some retail stores. The market does not meet all the dietary needs of its community. (In response to this comment, ENYF notes its efforts to expand its offerings, including soliciting vendors to sell baked goods and vegan items. It also notes that “our market is the only place in East New York to find local and organic produce and Caribbean specialty crops like karela, bora, and callaloo” [United Community Centers, n.d., para. 2]). Another goal is to offer a safe community space, which led ENYF to beautify the area where it hosts the farmers market and to integrate performing arts and family activities into sales days. The final goal was to engage local youth. Through paid internships, teenagers from East New York run their own Youth Farm, set up market stands for local vendors, help gardeners who may need harvest assistance, and sell their farm and local gardeners’ produce at a community “Share Table” at both the Saturday market and the Wednesday farm stand.

To keep the market financially accessible, ENYF substantially subsidizes it. ENYF estimates that market revenues cover under a quarter of its operating costs. Former ENYF director Sarita Daftary-Steel notes that “we think of our market as

a program—not just a market” (2014).

ENYF employs a market manager and mentors youth interns to run the market with associated activities and programs. Saturday market vendors include 10 to 16 local community members who sell food and crafts they grow or make and a few (one to three) regional farmers. In addition, about 50 local gardeners sell some of their harvest at a “Share Table” staffed by ENYF youth interns. They also sell produce from the Youth Farm grown by the interns. Counting the gardeners as one vendor, the market includes about 24 total vendors over the course of a season.

About half the purchases made at the East New York Farmers Market each year (e.g., 49% in each of 2011 and 2012) are made with nutrition benefit funds supplied to families struggling with low incomes via state and federal programs. Vendors gross an average of about US\$380 at a Saturday market, with a range of US\$24 to over US\$2,800. Table 1 summarizes the characteristics of the markets and their contexts.

What the Markets “Do,” from Vendor Perspectives
Vendors in both markets identified four main benefits of their participation: generating income, providing autonomy, garnering respect, and increasing social connectedness. Unless otherwise specified, these results derive from the analysis of the interview transcripts with 44 vendors who make or prepare at least part of what they sell at the Suva or East New York markets.

Generate income

Income was the primary reason that Suva market vendors cited for both participating in and enjoying their market work. For example, one vendor noted that, “It’s just about how to support the family, money-wise. It’s just all about money-wise.” Another said, “I’m happy because we get money.” For most of the Suva vendors in this study, even those only selling on weekends, working in the market is what enables their participation in the monetized component of the nation’s economy. For example, as one vendor notes, “At the village, we plant dalo, cassava, everything like that; only the salt, the sugar, the kerosene we used to buy, only that. That’s why I want to come and sell the good.”

Another says, “We get money incoming, sometimes I help the family, the whole family for the food, the electricity, the water.” Paying for children’s education was also frequently mentioned as a reason for needing to make money in the market; most schools in Fiji charge fees, and families must also provide school uniforms. One vendor said that before she started selling in the market, “We either got the bread or paid the fees.” A grandmother vending explained, “That’s why I’m selling. For the school fees, the uniform, the shoes, everything like that for the schooling. Books.” A vendor’s daughter, who earned a degree at the University of the South Pacific, said, “I thank my parents for their support. Without this market, I wouldn’t be anything now.”

In East New York, the full market is only on Saturdays and only for about half the year. Vending there is not a way for families to make a living. However, one of the vendors described the extra income earned at the market as helping “to make ends meet.” Three discussed using the market as a way to get started as entrepreneurs in order to make a living; for example, one said, “I don’t know where I would be a few years from now... but hopefully I might bring it into a business.”

As mentioned above, the survey results help quantify the revenue benefits of the markets for vendors, though only as gross rather than net takings, and with enormous ranges (see Table 2). As mentioned above, the 28 Suva vendors who responded to the 2013 survey and indicated they sell at least some food they grew or prepared themselves, reported approximately US\$50 each day at the previous weekend’s market (Friday and Saturday). Annualized, if selling for 48 weekends each year, this would total US\$4,800 a year.

In East New York, the average takings for a vendor selling at a Saturday market in the 2011 and 2012 seasons were just over US\$380. The average total revenue per vendor was just under US\$5,600 over the course of the season. Vendors attended an average of 11 markets out of the 21 possible in each of those years. Including only East New York community vendors (i.e., excluding regional farmers), the average Saturday market revenue was US\$227. The average season total for these hyper-local vendors was US\$2,307, who sold at an aver-

age of just under 10 markets each season. Regional farmers, who grow food outside New York City, sold at an average of 14 markets in each of the 2011 and 2012 seasons, and each garnered an average of US\$18,033 in total revenue over the course of the season.

Foster autonomy

Both East New York and Suva traders mentioned enjoying having control of their own businesses, time, and decisions. The benefits of being one’s own boss emerged as an especially strong sub-theme of autonomy in Fiji. For example, one Fijian vendor explained, “Before, I used to work in government ... but I quit all that just to be my boss and be in the market, and I don’t want to listen to anybody and to let anybody to be my boss, so I just want me to be my own boss, so that’s why I prefer to come to the market.” Another said, “Other jobs, somebody else own us. In the market, only yourself own yourself.” One Fijian woman summarized the advantage of being a vendor as “nobody boss you, only the God boss you”. Another described it as “empowering women.” East New York vendors spoke about autonomy as a benefit of entrepreneurship. One said he jumped at the opportunity to join the farmers market when he saw an advertisement for vendors because he had “always wanted to be an entrepreneur.” Another vendor said she started her market business because she wanted to control her work schedule and does not like a “9 to 5” timetable.

Garner respect

Fijian participants especially discussed earning respect from their work in the market, usually as a direct result of their ability to earn money. For example, when one woman was asked if her family is proud of her, she answered, “They proud, because when I go back, I take the money back so that my family can live on that.” Another discussed this gain for a friend, who also vends at the Suva market, saying her friend’s family members “really support her, they really support. They’re really proud of her, that she’s getting money, supporting the family.” In a way unattached to revenue, but related to the larger social justice mission of ENYF, an East New York vendor mentioned the respect

he gained from his son, saying “yeah, he’s proud of his dad you know, in terms of he sees his dad as doing something that he enjoys and that he loves.”

However, in exceptions to this theme, two female Suva vendors spoke about their market participation inspiring pity. For example, one woman, speaking through a translator, said, “that her family feel sorry for her coming to the market, sitting down and then selling, spending time in the market. She said it’s her duty to come and support the family. But for them, it’s only men that brings money to the family.”

Create social connections

Enjoying social aspects of the market was another benefit that vendors in both markets reported. One woman in Suva explained, “I like to stay in the market. For selling, for meeting the friend.” Another offered, “I don’t know, but myself I say, better I don’t stay home. Come to the market, do something, talk to somebody, make you feel little better. If you stay home, you feel bad, eh [laughing].” Another reported, “I feel good when I stay in the market. I met a lot of friends, we can love each other, we know each other. Some people we didn’t know, they came to the market, we all know.”

The ENYF vendors also mentioned enjoying socializing at the market, saying, for example, “I enjoy the little parties we have here.” Some also focused on the benefits of cultural exchange. One vendor noted that the market “brings all the people from all walks of life, you know, so it’s a good thing. Everybody get together, you know, socialize.” In East New York, vendors talked about connectedness in ways entwined with the other programs and activities that ENYF does, as mentioned in the next results section. A cultural theme also appeared in Suva. For example, one Suva market vendor explained, “I like what I’m doing selling, meeting people, selling to everybody, different kind of people, different culture.” Another said it had pushed her to be more socially and culturally open, saying, “Yes! Good change. The way we should talk, we should respect each other, to go and talk to other people we don’t know. We should go and give sometimes to our friends to come and share the table.”

Food and other themes

The four themes above were the dominant ones that vendors in both Suva and East New York shared about what markets do for them. An additional theme for Suva vendors, not shared by the Brooklyn ones, was logistical and financial challenges of selling at the market. For example, many Fijian vendors travel from distant rural areas and sleep at the market. Many also supplement their own wares with produce bought from wholesalers and resellers, which vendors noted bring smaller margins.

An additional theme for the Brooklyn vendors was the relationship of the market with other activities of the market host organization, ENYF, including festivals, loan programs, and community gardening. These themes were integrated with those about their experiences as vendors at the market. For example, within the span of a few minutes, one vendor spoke of participating in a pepper festival, being the first to sell West Indian long beans at the market, serving as a community food educator, beekeeping, and deciding to grow and sell her own corn.

Although all the vendors who contributed to this study, in both Suva and Brooklyn, grow or prepare and sell food, food in the context of consumption was only a minor theme. For Suva vendors, the dominant connection was via income, with many noting they use the market revenues to buy the food they cannot produce themselves (tea, salt, sugar, and flour being the most mentioned) for their families. Suva vendors did not often mention eating what they grow, although frequent comments about buying only staples with their market income imply that subsistence farming and gardening are major sources of food. For example, one vendor noted that “In town, you have to pay everything. In the village, no, only the sugar.” One East New York vendor also mentioned that growing so much food not only makes money at the market, but also saves money on groceries, noting that her family goes “to the grocery store for codfish and maybe some juice, so we don’t really buy a whole lot of stuff. Like our tomatoes, we freeze our tomatoes.” Enough gardeners have harvests beyond their household needs that they help stock the East New York Farmers Market

Share Table, described above.

Food quality was a minor theme for vendors in both places. One Suva vendor noted her produce was “fresh, healthy, straight from the farm,” in contrast to those who bought from wholesalers (most who compared these sources focused on the better profit margin, rather than on produce quality). Another vendor in Fiji said, “We have to just bring the good produce so that the customer can, because they also work for their money. They spend good money, too, so that we have to sell good produce.” East New York market vendors also viewed the homegrown produce more favorably than produce available at supermarkets; for example, one compared her corn to that from a store saying, “by the time we get it, it’s already starting to lose its flavor.” In addition, one vendor in each place mentioned the quality advantage of knowing the food they grow is not contaminated with chemicals.

A final food theme unique to East New York vendors was their role in providing access to quality produce (e.g., “My supermarket was horrible. Food was old, the produce section was small”) and to culturally important produce (e.g., “We were one of the first farmers that had the long beans”) that is usually not available in neighborhood stores.

Discussion

Harriet Friedmann has said that she searches for “daisies in the concrete” of an industrialized, globalized food system (personal communication, 2009). Friedmann’s flower analogy conjures an inorganic versus biological metaphor for corporate vs. alternative food supply chains. In one metaphor, heavy-gauge steel carries, for example, Kenyan green beans to London supermarkets and Fiji Water to Brooklyn bodegas. In the rare instances when these inorganic chains or cogs break, we mine and forge materials for their repair. The alternative is more like a daisy chain—short, organic, easily broken, and easily regenerated—as long as flowers grow. If comparing these two markets to Friedmann’s flowers, one has survived the concrete pouring, and another has broken through it. These two markets are old vs. new, Global South vs. Global North, daily vs. weekly, all year vs. 23 weeks in a season, large vs. small, and with municipi-

pal vs. not-for-profit management. One is a traditional market “hold-out” from the global spread of supermarkets and one a farmers market founded much more recently as an alternative to the corporate food regime. However, in spite of their many differences, we find similarities in what they do for vendors and, more abstractly, in their socio-political roles when viewed through a food regime framework lens, as discussed below.

The four main kinds of benefits reported by vendors in both Suva and Brooklyn are generating income, autonomy, respect, and social connectedness. These social and economic benefits also mirror those identified in previous research conducted with markets in the Global North, such as in a study with farmers selling in upstate New York (Griffin & Frongillo, 2003), and the Global South, such as in Chiapas, Mexico, and Lima, Peru (Bellante, 2017; Cody, 2015b). As noted, not all participating vendors in Suva reported that the market garnered them respect. Some women vendors said that they, instead, receive pity for having to help their husbands support their families. Some Fijian vendors interviewed (but none of those in Brooklyn) also discussed the challenges associated with traveling to the market and the small profit margins they gained when they had to first buy food from wholesalers.

The income benefits that vendors generally reported qualitatively in interviews are also quantified by the survey results. Though these revenue figures are gross, not net, comparing them to income figures helps put the relative amounts into perspective. For example, the weekend gross revenue reported by Suva vendors in the 2013 survey annualizes to an amount nearly identical to Fiji’s average annual per capita income that year (World Bank, n.d.). In East New York, the full market is only open on Saturdays during just over half the year, so vending there is not a way for families to make a living. However, the income generated is not insubstantial. The average gross annual revenue for the Saturday vendors who are from the East New York community (US\$2,307) represents about 7% of the median household income in East New York (New York City Department of Housing Preservation, 2015). The average gross earnings for each of the regional farmers selling at the East

New York market were nearly eight times that.

Also, both markets provide their urban communities with access to fresh, regional, and culturally important foods—whether fresh coconuts arriving from Koro Island in Fiji, leafy green callaloo grown in Brooklyn, or apples from orchards outside New York City. Both markets examined here also serve their communities at large, with higher quality foods and foods not available at all in supermarkets. This contrasts with findings from some other studies that report customers being disproportionately wealthier than the communities in which the markets are located, particularly in the Global North (Alkon, 2008; Brown, 2002; Rice, 2015; Schupp, 2016). Some markets, such as those discussed here, are exceptions to this, serving the communities in which they are based (e.g., Hicks & Lambert-Pennington, 2014).

The primary limitation of the ENYF market's service to the community might be its limited availability, with just one market and one farm stand day per week in season. This means it cannot offer primary jobs for vendors and is not as accessible as grocery stores in terms of open hours. In a comprehensive study of the Suva Municipal Market, Dewey (2011) identifies major challenges that the market's predominately female vendors experience. These vendors report difficult and unsanitary conditions both in the transit they must take to and from rural villages to the city and at the combined open-air, outdoor market, which does not provide adequate running water or toilets. Female vendors do also face some stigma (or "pity," to use some vendors' words), and potentially other consequences of undermining the Fijian norm that positions only men as income generators for a family (Dewey, 2011).

Turning to the question of the role traditional and farmers markets play in food regimes, some scholars question how much of an alternative they really provide to the neoliberal engine of the corporate regime (Alkon & Mares 2012; Guthman, 2008; McClintock, 2014). These and other markets aim to advance human well-being in part "by liber-

ating individual entrepreneurial freedoms and skills," per Harvey's definition of neoliberalism (2005). Our results suggest that the markets in East New York and Suva are succeeding in that neoliberal goal.

The markets are organized to also achieve many other social goods, including via fostering entrepreneurship for non-neoliberal ends, for a "moral economy," for example (Leiper & Clarke-Sather, 2017, p. 840). They distribute economic opportunities rather than consolidate them, enabling vendors to directly exchange what they produce, rather than relying on bottlenecked, centralized corporate markets (see, e.g., Griffin & Frongillo, 2003). In East New York, the host organization heavily subsidizes the market as a program that provides public social and celebration space, community-led workshops, and affordable and appropriate food in addition to economic opportunities for community members as vendors (Daftary-Steel, 2014; Daftary-Steel & Gervais, 2015; Daftary-Steel, Porter, Gervais, Marshall, & Vigil, 2017). Since the time of our data gathering, the Suva market organizers have partnered with the United Nations-sponsored "Markets for Change" program to train vendors, especially women vendors, to strengthen their "economic security, rights and livelihoods" (UNDP Pacific Office in Fiji, 2016).

Also, the immediate institutional contexts of local government or not-for-profit organizations that host these markets are characterized by much more than the neoliberal framework of "private property rights, free markets, and free trade" (Harvey, 2005) that shapes the third regime. These market operations are not subsumed by the "financialization" of supermarket chains in the corporate food regime (Burch & Lawrence, 2013). They are possibly even immune to it; traditional markets and farmers markets are not targets for takeover by incorporation but by reduction or elimination (including by imitation⁴). And, as the financial earnings figures in both Suva and Brooklyn show, the markets have provided significant opportunities for highly distributed and autonomous in-

⁴ See, e.g., China's Sun-Mart mimicking open-air market displays (Trefis Team & Great Speculations, 2014) and, at the product level, Prego "Farmers' Market" tomato sauces that the manufacturer describes as "made with ingredients you would find at your local farmers market" (Campbell Soup Company, 2016, para. 1).

come generation to people who are producing and preparing food in each community and region at micro- and small scales. As a study of markets in Argentina suggests, farmers markets are often both complicit in and yet a means to resist neoliberalism (Leslie, 2017), and this is the case with these two markets as well.

Viewed through the historical and socio-political lens of food regimes, these markets—in East New York, Suva, and around the world—are globally local. As discussed by Alkon (2008), many farmers markets operations and activities have moral drivers, with income generation being employed as one means to social ends in a “morally embedded economic exchange” (p. 488). Returning to the Nyéléni food sovereignty declaration (Forum for Food Sovereignty, 2007), these public, traditional, and farmers markets can put the aspirations and needs of those who produce, distribute, and consume food at the heart of their work, and often do. They offer perhaps the most promising fresh food grocery alternative to a reign of supermarkets (and to the more recent growth in online grocery markets [Kantar Worldpanel, 2017]). Even in the U.S., although farmers markets and stands garner a very small share of the grocery dollar (less than 9% vs. at least 38% in Fiji), the availability of markets in communities is relatively high. The ratio of farmers markets to supermarkets in the U.S. is 73% of Fiji’s ratio (22 vs. 30 markets per 100 supermarkets).

This macro perspective on the regime role that traditional and farmers markets play around the world raises questions about how to best sustain and expand the community and farmer benefits of local markets while minimizing their challenges and limitations. We suggest that examining market and other “alternative” food system questions through a global lens, encompassing both South and North as done with two cases here, may offer new insights into what markets can do for small and regional farmers and food-insecure communities, especially in terms of resisting industrialized, neoliberal food systems that do not serve them.

In the case of markets, a persistent question in both North and South are what market policies and practices are most effective at centering people—as producers, vendors, and eaters—as benefi-

ciaries, and how to maximize market production of social benefits. These are questions raised in the PIM study in Fiji and by community-based organizations partnering in the Food Dignity collaboration (in direct response, a former director of ENYF wrote a market guide [Daftary-Steel, 2014]). This kind of global analysis at local scales could be useful in better understanding and supporting other alternative food actions, such as food hubs. For example, Fiji has been supporting the development of “collection centres” in Fiji, to replace imported produce used in the tourist industry with yields from local farmers (Tuqa, Lobendahn, & Bainivalu, 2018). Their efforts seem to face at least some challenges similar to those of U.S.-based food hubs, such as a lack of postharvest infrastructure that preserves produce quality, the high cost of transportation, and the inadequate proportion of revenue that goes back to farmers who otherwise sell directly at markets (Hoey, Shapiro, & Bielaczyc, 2018).

Conclusion

This study adds to the literature in several ways. One, it makes a relatively minor addition to research on markets by collecting and synthesizing some detailed empirical data in two case studies. These data may offer useful comparisons in future studies that characterize, for example, reported vendor earnings and other benefits.

Two, it compares and contrasts two very different urban markets—one large, daily, Global South market that is over 120 years old, and one small, seasonal and weekly, Global North neighborhood market less than 20 years old. We find that both foster income generation, autonomy, and social connectedness while distributing means of food exchange and making fresh and culturally relevant foods available to their communities.

These are interesting, but also not groundbreaking findings. However, they contribute in a third way. They begin to break ground on examining specific instances of alternative food initiatives across the Global South and North, which is currently uncommon in academic research. This may be the first study to do so with markets (although a recent study usefully compared markets in U.S. and Austrian cities to elucidate their embedded values

[Klimek, Bingen, & Freyer, 2018]). Given the commonalities in benefits to vendors in two otherwise radically different markets and contexts, useful answers to future research and action questions outlined above may be found by examining local alternative food initiatives through a lens that spans the Global North and South.

Finally, the regime framework offers a power-

ful global and historical lens for understanding, and possibly predicting or even shaping, food system shifts. However, it can be unwieldy when used to examine specific instances of resistance and alternatives to the current corporate regime. We suggest that global comparisons such as this one can help stabilize, inform, and focus the regime framework lens on such local, empirical cases.

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Household food insecurity, coping strategies, and happiness: The case of two public housing communities

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Abstract

Food insecurity continues to affect a significant number of U.S. households, even during periods of economic growth and prosperity. Household food insecurity in the U.S. is measured with the Food Security Core Survey Module, which reflects the importance of household financial resource constraint as the ultimate cause of food insecurity. While the module recognizes some of the strategies households employ to cope with food hardships, it hardly encompasses the salient strategies commonly used by low-income families. The purpose of this study is to identify the major strategies low-income households employ to cope with their food insecurity, and to gain insight into the process they go through toward making ends meet and into how

the process may affect their sense of overall happiness. To this end, a survey instrument¹ was developed and administered to low-income households in two public housing communities in Atlanta, Georgia. The results indicated that the majority of the sampled households, even those classified as food secure, report insufficiency of income to cover their monthly expenses. As a consequence, they employed a number of coping strategies to make ends meet. These included forgoing or delaying purchases of non-food items and borrowing or seeking help from friends and relatives. The study also found a mismatch between household self-assessment of their food conditions and food-security level classification. Despite the severity of coping strategies used,

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¹ The survey instrument it is available from the corresponding author upon request.

some households reported overall happiness with their lives, although, for the majority, the results suggested a positive association between perceptions of food sufficiency and a sense of overall happiness.

Keywords

Household Food Security, Food Assistance, Temporary Assistance for Needy Families (TANF), Public Housing Communities, Atlanta, USDA Food Security Core Survey Module, Coping Strategies, Happiness

Introduction

In 1984, the President's Task Force on Food Assistance noted that despite the long period of economic growth and relatively low unemployment that characterized the American economy over the prior decade, food insufficiency and hunger had continued to affect certain segments of the population at the household and individual levels (Gundersen & Ziliak, 2018; Nord & Andrews, 2002; Olson, 1999; President's Task Force, 1994). The problem of food insufficiency still remains a thorny issue, even during periods of economic growth. For example, in 2018, 14.3 million households were food insecure at some point during the year (U.S. Department of Agriculture Economic Research Service [USDA ERS], 2019b). Some sectors of the population are more vulnerable than others. For example, 22.5% of African-American and 18.5% of Hispanic households were food insecure, higher than the national average of 12.3% (USDA ERS, 2019b). Because food insufficiency is recognized as posing long-lasting challenges to nutrition, health, and social policy, there has been growing interest among researchers at public and private institutions both to measure U.S. food insufficiency and to generate explanations (Bickel, Nord, Price, Hamilton, & Cook, 2000; Carlson,

Andrews, & Bickel, 1999; Gundersen & Ziliak, 2018; Maxwell & Smith, 1992; Olson, 1999; U.S. Department of Health & Human Services & USDA, 1993).

These efforts led to the development of the Food Security Core Survey Module (FSCSM), a standard method of measuring household food security in the U.S. and Canada (Bickel et al., 2000; Tarasuk & Beaton, 1999; USDA ARS, 1998). The module, which has been included as a Food Security Supplement to the Current Population Survey of the Bureau of the Census since 1995, is designed with a view to "obtaining information on a variety of specific conditions, experiences, and behaviors that serve as indicators of the varying degrees of the severity of the condition" from household direct responses to a series of 18 questions (Bickel et al., 2000, p. 9). The questions reflect different levels of severity of household food insecurity ranging, for example, from worrying about running out of food (least severe) to skipping meals or going without food all day (most severe).

The responses to the survey questions are combined into a single measure, the household food security scale, which measures the extent of household food insecurity as perceived, experienced, and described by respondents.² The scale classifies respondents into four categories, each representing a range of severity. Until 2006, the four categories were food secure, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe hunger. The categories were renamed in 2006, with the assessment method remaining the same, to the following comparable ranges of food security: high food security, moderate food security, low food security, and very low food security.³

The survey instrument reflects and underscores the importance of household financial

² The scale is not affected by hunger due to voluntary dieting or fasting, normally, since food insecurity and hunger are the result of lack of money or other relevant resources to obtain food, as implied by the 18 questions (Bickel et al., 2000).

³ The USDA Economics Research Service notes the comparability of the old and new labels: "**High food security** (*old label=Food security*): no reported indications of food-access problems or limitations . . . **Marginal food security** (*old label=Food security*): one or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake . . . **Low food security** (*old label=Food insecurity without hunger*): reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake. . . **Very low food security** (*old label=Food insecurity with hunger*): Reports of multiple indications of disrupted eating patterns and reduced food intake" (USDA ERS, 2019a).

resource constraints as the ultimate cause of food insecurity, and provides more comprehensive information about the nature, occurrence, and degree of food deprivation than can be determined through traditional income and poverty measures. Nonetheless, the FSCSM has some well-recognized limitations, one of which pertains to coping strategies. The food security scale recognizes some of the strategies that households employ to cope with their food hardships.⁴ However, it does not, for obvious reasons, encompass all of the major strategies commonly employed by low-income families. Households who somehow meet their basic food needs using coping strategies that are not included in the survey instruments could conceivably be classified as food secure. Their sense of insecurity would probably surface if references were made in the survey to other commonly used coping mechanisms. These coping mechanisms are likely to increase in variety and frequency for low-income families, all the more so as household income further decreases.

It is not uncommon for households at different income levels to use various money-saving and income-augmenting techniques in their efforts to meet their food needs (Hill & Kauff, 2001; Bartfeld & Collins, 2017). However, as Hill and Kauff (2001) have noted, for low-income families “often living to the proverbial edge, routine strategies can make the difference between whether or not they can make ends meet each month” (p. 18). Understanding the frequency and intensity of coping mechanisms in use not only helps test the validity of the standard food security scale among very low-income families but also informs policy interventions to the extent that household food-insecurity status is understated by the standard survey instrument (Nord, Coleman-Jensen, Andrews, & Carlson, 2010).

In light of the coping mechanisms employed, it is also worth investigating how households assess their food conditions and how that relates to their sense of overall happiness. Happiness is becoming increasingly important both as an end/policy target and, possibly, as a means for improving personal

well-being and as a determinant of economic outcomes (Sen, 1985; Piekałkiewicz, 2017). It is to be expected, as Prime Minister Tshering Tobgay of Bhutan noted in his remarks at the Climate Change and Food Security panel of the 2017 World Government Summit in Dubai: “You can’t be happy if you are hungry. Food security is fundamental to happiness” (Debusmann, 2017). It is worth exploring the link between perceptions of food sufficiency and happiness as expressed by respondents cognizant of the different conceptions, dimensions, manifestations, measures, and determinants of happiness and of the limitations that these aspects of happiness may impose. In our view, this study will fill a gap in the existing literature on food insecurity coping strategies and their effects on perception of happiness.

The purpose of this study is, therefore, to identify the strategies used by very low-income households to cope with their food insecurity and to gain insight into the process they must go through toward making ends meet. Moreover, the study seeks to explore the implications of the coping strategies and household self-assessment of food conditions for the relevance and validity of the standard food-security classification and for household sense of overall happiness. To this end, informed in part by the results reported by Hill and Kauff (2001), we developed a survey instrument which was administered to low-income households in two public housing communities in Atlanta, Georgia. The coping strategy survey was conducted in 2004, following a modified food security survey (FSCSM) which we administered to assess the relationship between food insecurity events and government food assistance programs in the two communities.⁵

The remainder of this paper is organized as follows. The second section provides an overview of the sample; the third section describes the income levels and sources of income of the respondents. The fourth section identifies and describes the strategies that households employ to meet their food needs. In the fifth section, we present the households’ self-assessment of the

⁴ For example, substituting for or relying on a few kinds of low-cost food (question #5 of FSCSM).

⁵ For a comparative study of food security conditions in the two communities, see Bezuneh and Yiheyis (2003).

levels of satisfaction of their food needs and of their overall well-being. The sixth section summarizes the findings of the study and concludes with policy implications.

The Study Sites and Basic Profile of the Sample

The sites for this study were two public housing communities with low- and mixed-income households in Atlanta, Georgia.⁶ The low-income public housing community had 500 apartment units, of which 493 were occupied at the time of the survey. The community housed a total population of 1,201, with an average age of 24, half of them under 18, and 65% female. Single heads of households constituted the overwhelming majority of the community (97%). The annual household income averaged \$7,449,⁷ which was for a community with a mean family size of 2.4. Roughly one of three householders and more than a quarter of adults aged between 18 and 54 were unemployed. Twenty-nine percent of households in the community had persons with disabilities, 30% received social security benefits (S.S.I.), and 21% received temporary assistance for needy families (TANF).

At the time of the survey, the mixed-income community was home for 182 low-income households receiving housing subsidies. The total number of residents was 365, of whom 163 were children (45%) and 264 female (72%). Of household heads, 97% were single, and 50% were unemployed. Forty-six percent of adults between 18 and 54 years of age were unemployed. The mean family size was two, with an average household income of \$11,493. One in five households had persons with disabilities, and a lower proportion received SSI (14%) and TANF (9%).

The sample was randomly drawn from low-income households residing in these two communities. Heads of households were interviewed in person in their homes. The sample size for the household food security survey was 322, which represented 48% of the households from the two communities at the time of the survey. The survey

on coping strategies was conducted with 59 households who were available and willing to participate in the survey.

Table 1 presents the basic profile of the sample for the study of coping strategies. The family size in the sample ranged between one and eight, with only one household having eight members. The majority of the sampled households had at least two members, although the number of single-member households was hardly negligible. Children were present in 58% of the families interviewed. Families with children were predominantly female-headed. Half of the household heads that provided

Table 1. Basic Characteristics of the Coping Strategies Study Sample

Characteristics	Households	
	Number	Percent
Household size:		
1 member	19	32.2%
2–3 members	27	45.8
4–8 members	13	22.0
Family structure:		
Households, no children	34	57.6
Single parent (mother)	24	40.7
Dual parent	1	1.7
Household head education:		
College or some college	6	10.2
High school or some high school	41	69.5
Less than high school or none	10	16.9
Not disclosed	2	3.4
Employed family members:		
Two	2	3.4
One	15	25.4
None	42	71.2
Family monthly income (US\$):		
Less than \$500	16	27.1
\$500–\$999	41	69.5
\$1,000–\$1,999	1	1.7
Not disclosed	1	1.7
Food security status:		
Secure	19	32.2
Insecure	40	67.8

Note: The status of employment is as reported or described by respondents. “Unemployed” here and in related discussions refers to the condition of not working, not necessarily in the sense of the standard or official definition of unemployment.

⁶ The description of the study sites in this and the following paragraph is based on the demographics data summaries obtained from the management offices of the two communities.

⁷ All currencies are in US dollars.

the relevant information had attained at least a high school education. For every ten households interviewed, three reported that at least one family member was employed during the 12 months prior to the interview period, with an average duration of employment of nine months. A majority of the coping strategies sample (68%) was food insecure, as determined from the initial survey results previously described. This figure is considerably higher than the 52% found for the entire sample and roughly six times the national average (11.9%) reported for 2004. For the same year, the food insecurity rate among the black, non-Hispanic segment of the population was 23.7%, while the average for Georgia was 12.6%, indicating a very high prevalence of food security in the study sites at the time.⁸

Level and Sources of Income

Of the 58 families who disclosed their incomes, all but one had a monthly household income of less than \$1,000. The major sources of income included government assistance, social security benefits, and employment. For every four households interviewed, at least one reported an income of less than \$500 per month. The self-reported income levels of the respondents clearly indicated that the sample households lived on meager incomes, which becomes more evident when reported family income is viewed relative to household size and the poverty threshold at the time. Thus, 14 of the 16 households (87.5%) with a total monthly income of less than \$500 had two or more members. Likewise, more than half of the households with reported income between \$500 and \$1,000 had multiple members. A monthly income of more than \$1,000 was reported by only one household, which also had the largest family size (eight) in the sample. To place these data in perspective, in 2003 (the year of the survey) the weighted average poverty thresholds ranged from \$9,573 (for one person, unrelated individual), \$18,810 (a household with four members) to \$31,589 (for a household of

eight members), indicating that all the self-reported income levels were far below the poverty line.⁹

For most of the respondents, there was little variation in the level of their incomes from month to month. The sources of their incomes included government assistance (68%), social security benefits (39%), employment income (20%), child support (7%), and workers' compensation (1.7%). Roughly half of the surveyed families derived their incomes from more than one source.¹⁰ Among the 29 households that indicated multiple sources of income, 38% identified social security benefits as the most important source, followed by the Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps (21%), wages (17%), and Supplemental Security Income (SSI) (17%).

Only seven families (12%) indicated wages as the only source of income. Most of them reported a monthly income of less than \$1,000. As previously noted, the majority of respondents received some type of government assistance in addition to their housing subsidy. The three most frequently identified types of government assistance received were—in order of frequency—TANF, SNAP, and WIC. At the time of the interview, the duration of respondent participation in government assistance programs ranged from two months to 33 years. The majority of the recipients had been on government assistance for more than four years. All the recipients felt that government assistance was either so important (43%) or extremely important (57%) in their family budget that it would have been tough or impossible to make ends meet without it. Of all the food-insecure households, 72% reported that they received government assistance.

The majority of respondents indicated that their income levels were so low that they were unable to cover their basic expenses each month (Table 2). This remained true even when the sample was dichotomized by certain attributes. Families with children reported income shortfall at

⁸ USDA ERS, 2019b. The average food insecurity rate for Georgia spans 2004–2006.

⁹ <https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-poverty-thresholds/thresh04.csv>

¹⁰ Figures in parentheses represent households (as a percentage of the sample) who identified the item in the list of their income sources.

a higher rate than households with no children. Households with two or more adults experienced less severe income shortfall than their single-adult counterparts. Likewise, households whose source of income included wages were able to cover their expenses at a substantially higher rate than those with no employed members. Nearly all households below the monthly income level of \$500 reported that their expenses exceeded their incomes. The proportion was noticeably lower for households in the next higher income range.

As would be expected, ability to cover expenses was also correlated with household food security status. The percentage of food-secure households that

affirmed the sufficiency of income was more than three times that of food-insecure families. However, not all food-secure households had sufficient income relative to their expenses. In fact, the majority of them (63%) did not. The fact that some households were classified as food secure while they were unable to cover expenses each month may partly reflect their priority to meet food needs while forgoing or deferring other purchases of goods or services.

Household Coping Strategies

Households coped with their food insecurity in several ways. For example, Maxwell (1995) identifies six short-term, food-based coping strategies mentioned by survey respondents and listed in increasing order of severity: Eating less preferred foods, limiting portion size, borrowing food or money to buy food, maternal buffering (a mother substantially limits her eating, usually for the sake

Table 2. Sufficiency of Household Income to Cover Monthly Expenses by Selected Attributes

Selected Attributes	Was income sufficient to cover monthly expenses? (Households)				Total Number of Households
	Yes		No		
	Number	Percent*	Number	Percent*	
Households with:					
Children	3	12.0%	22	88.0%	25
No children	8	23.5	26	76.5	34
Households with:					
One adult	4	11.8	30	88.2	34
Two or more adults	7	28.0	18	72.0	25
Households with:					
No employed member	6	14.3	36	85.7	42
Employed member(s)	5	29.4	12	70.6	17
Households with monthly income (US\$) of:					
Less than \$500	1	6.3	15	93.7	16
\$500–\$999	9	22.0	32	78.0	41
\$1,000–\$1,999	0	0.0	1	100.0	1
Undisclosed amount	1	100	0	0.0	1
Households classified as:					
Food secure	7	36.8	12	63.2	19
Food insecure	4	10.0	36	90.0	40
Full sample	11	18.6	48	81.4	59

* Figures represent the percentage of total number of households in the respective attribute categories.

of her very young children), skipping meals, and skipping eating for whole days (pp. 9-11). Some of these are reflected in the standard food security survey instrument.¹¹ However, these coping strategies are only food-based, and they do not bring to the fore the efforts that households have to make to avoid the relatively more severe ones among them. More broadly, household coping strategies involve income-augmenting and cost-cutting measures. The survey instrument designed and administered for this study included questions that elicit information on these strategies. The results of the survey are summarized below, where the financial circumstances of households, the strategies they employ to make ends meet, and their overall well-being are described.

As stated, the majority of surveyed households that were food secure reported an inability to finance their monthly expenses. This suggests that these households employed different coping strate-

¹¹ For example, questions #5–8 of the FSCSM.

gies, not reflected in the standard food security survey instrument, in their attempts to meet their food needs. Given that the overwhelming majority of the respondents lived on insufficient incomes that fell short of needed expenses, it would be informative for policymakers, social workers, and other interested parties to learn how families in question got by. Respondents were asked about how they stretched their incomes to finance their basic monthly expenses. Their responses are summarized in Table 3, where the frequencies of the strategies employed are presented.

The most common strategy for making ends meet was to stretch the money they had by controlling expenses. This strategy was mentioned by 77% of the respondents. The second most frequently used method was borrowing from friends and relatives, which was reported by roughly two-thirds of the relevant sample. A sizeable number also sought help from different sources, including relatives, friends, and churches. They reported receiving

donations such as canned food, cereals, clothing, and monetary assistance from individuals and community organizations. Households also attempted to make ends meet by prioritizing their expenses: deciding which bills to pay on time, which ones to defer, and which ones to pay partially. Rent, electric bills, food, and phone bills were frequently mentioned in the list of priority expense items.

In addition to money-saving techniques, some households sought out opportunities to supplement income received from the formal sources mentioned above. A quarter of the relevant sample reported having rendered different kinds of services to friends, relatives, and others in exchange for cash. These services included babysitting, hairbraiding, helping people move, doing yard work, and housekeeping. Some families went as far as pawning their belongings to cover certain expenses.

For the primary coping strategy, controlling expenses, respondents used a variety of techniques to limit their expenses (Table 4). The majority of

Table 3. List and Frequencies of Strategies Used to Make Ends Meet

Coping Strategies	Number of households Mentioning the strategy	Households mentioning the strategy (% of relevant sample*)
Controlling expenses	41	77.4%
Borrowed from friends and relatives	34	64.2
Sought help from relatives, friends, and community organizations	24	45.3
Prioritized monthly expenses	20	37.7
Sought opportunity for cash	13	24.5
Pawned belongings	5	9.4
Other	2	3.8

*The relevant sample size is 53, the number of respondents who indicated how they make ends meet.

Table 4. Coping Strategies: Control Household Expenses

Ways of controlling expenses	# of households mentioning method	Households mentioning method as % of relevant sample*
Forego buying clothes and shoes, not buying expensive clothes and shoes	24	58.5%
Buy only necessities, cut down buying junk food, forego special treats, not going out	9	22.0
Disconnect phone, cut back on phone calls	7	17.1
Use less electricity	6	14.6
Cut down food consumption in order to last for the month	4	9.8
Other	3	7.3

*The relevant sample size is 41, the number of respondents who indicated that they controlled expenses to make ends meet.

the relevant sample controlled expenses by forgoing purchases of clothes and shoes; in some cases, even for children. Other cost-saving techniques families used each month included buying less junk food, foregoing special treats, not going out for entertainment, dispensing with phone services, using less electricity for light and air conditioning, cutting down on food consumption, and, generally, purchasing only very basic necessities.

It is clear from the forgoing that households in the study sample lived on very low incomes, and most of them were unable to cover basic expenses from month to month. They struggled to make ends meet using a variety of cost-cutting and money-making strategies.

Food Needs Satisfaction and Overall Well-being: Household Self-Assessment

As discussed above, the kind and frequency of coping strategies employed indicate, by conventional measures and viewed from the perspective of outsiders, how vulnerable and precarious respondents' economic lives were. Facing such dire financial circumstances, how do families perceive and characterize their food conditions and their

overall well-being? This line of inquiry is intended to complement the standard food security analysis as it sheds additional insight into how respondents self-assess their views of their nutrition and overall life conditions, and how these two might be related.

Tables 5 and 6 record household self-assessments of how satisfied they were in meeting their food needs and how happy they were with their lives as a whole, on a four-part scale ranging from not at all satisfied (not at all happy) to very satisfied (very happy). Twenty-two percent of the respondents felt that they were very satisfied with meeting their food needs. Twice as many described their food situation as quite satisfactory; thus, 68% of the sampled households were quite or very satisfied with their food situation. In contrast, as reported above, the same percentage (68%) of the sample was classified as food insecure based on the standard scale of food security. This divergence may partly reflect the low threshold of expectations that respondents used to evaluate their food needs satisfaction, given their living conditions and without necessarily taking into account the process involved in reaching the threshold through the

Table 5. Levels of Food Needs Satisfaction and Overall Happiness

Level of satisfaction/happiness	Satisfaction with respect to food needs (Households)		Happiness with respect to life in general (Households)	
	Number	Percent	Number	Percent
Very satisfied/happy	13	22.0%	16	27.1%
Quite satisfied/happy	27	45.8	30	50.8
Not very satisfied/happy	18	30.5	12	20.3
Not at all satisfied/happy	1	1.7	1	1.7
Total	59	100.0	59	100

Table 6. Cross Tabulation of Levels of Food Needs Satisfaction and Overall Happiness

Level of satisfaction and level of happiness		Level of happiness with life in general				Total
		Very happy	Quite happy	Not very happy	Not at all happy	
Level of satisfaction with food needs	Very Satisfied	9	4	0	0	13
	Quite satisfied	5	16	5	1	27
	Not very satisfied	2	10	6	0	18
	Not at all satisfied	0	0	1	0	1
Total		16	30	12	1	59

various coping strategies discussed above.

It is worth noting that more than 60% of the respondents who were satisfied with respect to meeting their food needs participated in SNAP or WIC programs. However, not all recipients of food stamps rated their food condition as satisfactory. More than a quarter of participants receiving food benefits reported that their food needs were unmet. The corresponding figure for non-recipients was higher, at 38%. Taken together, these figures suggest that participation in SNAP or WIC programs seemed to have exerted some impact on household sense of satisfaction with respect to their food needs.

Next, we report how respondents viewed their overall subjective well-being and how this rating is related to their assessment of their food conditions. More than three-quarters of the sample felt that they were very happy or quite happy overall. More people expressed overall happiness in their lives (78%) than satisfaction with food needs (68%). A cross-tabulation of the two indicators (Table 6) shows that 34 families (58%) felt that their food condition was satisfactory and that they were happy. In contrast, seven households (12%) expressed dissatisfaction with their food condition and unhappiness about their lives in general. Contrary to what might be considered conventional wisdom, two families (3%) were dissatisfied with respect to meeting their food needs, and yet they characterized their life experiences as very happy, which may reflect what Sen (1983) described as a “cheerful disposition” that is not directly bound to possession of material resources and to one’s living standard (p. 160). On the other hand, six (10%) of the respondents were generally unhappy, although they were quite satisfied with their food situation.

Examining the extremes of respondent self-assessments discloses that none of the respondents who were very satisfied with their food condition reported unhappiness in their lives. Likewise, no household that was least satisfied with its food condition rated its overall happiness favorably. Curiously, no household ranked its condition at the bottom tier of the satisfaction/happiness spectrum on both counts. Taken together, the self-assessment results suggest that while a sense of satisfaction with respect to food sufficiency does not

ensure overall happiness, it may contribute to it (Feeny, McDonald, & Posso, 2014; White, Fernandez, & Jha, 2016). To put it differently, the findings seem to suggest that the ability to meet food needs is one of the contributing factors to overall well-being and happiness. This is consistent with the findings reported in empirical studies of the determinants of happiness, which also include non-economic factors such as leisure consumption, social connectedness/relationships, mental and physical health, and work-life balance (Clark, Flèche, Layard, Powdthavee, & Ward, 2017; DeLeire & Kalil, 2010; Graham, 2009; Layard, 2005; Li, 2016).

Summary and Conclusions

One of the well-known shortcomings of the standard food security scale pertains to coping strategies. The scale does not reflect the major strategies commonly employed by low-income families. Households who somehow manage to meet their basic food needs using coping strategies not included in the scale could conceivably be classified as food secure. Their basic sense of insecurity would probably surface if inquiry encompassed other commonly used coping strategies in addition to those included in the standard survey instrument. For example, 42% of the sampled households that were classified as food secure in the standard food-security scale reported controlling nonfood expenses as one of their coping strategies.


Accordingly, a separate coping strategy survey instrument was designed and administered. The results indicate that the overwhelming majority of the respondents reported inability to finance their basic expenses each month. Households employed a variety of cost-saving and money-making strategies in order to make ends meet. These included controlling expenses; borrowing from friends and relatives; seeking help from friends, relatives, and churches; prioritizing expenses; and seeking out opportunities to augment household incomes. Despite their dire financial circumstances, but partly because of the coping strategies they employ, roughly two-thirds of the respondents were satisfied with respect to meeting their food needs. Despite the financial hardships and challenges they face each month, more than three-quarters of the

sample expressed overall happiness.

The results of our study should, however, be interpreted with caution, partly because of the sample size on which they are based. A sample size of 59 is small, although hardly atypical for ethnographic studies involving in-depth, face-to-face interviews, as in the present study. In addition, the study uses descriptive statistics, focusing on the portrayal of household coping strategies and perceptions rather than on hypothesis testing. Indeed, a larger sample size and a quantitative analysis involving statistical tests would have enabled us to draw stronger conclusions. Despite these limitations, the reported findings are suggestive, and from them several tentative conclusions with policy implications could be drawn. First, despite receipt of government assistance, a substantial percentage of the sampled households remained food insecure. This may be partly due to the inadequacy of the amount and/or the ineffectiveness of the type of assistance received. In the light of further investigation of this particular issue, increasing the amount and/or accordingly tailoring the type of assistance provided would be an appropriate policy measure to enhance the food security conditions of the households in question. More specifically, the results of this study may inform the process of decision making for relevant departments at the state and federal government levels concerning the amount, type, and timing of support that needs to be provided to low and no-income households.

Second, low-income families can be classified as food secure, and yet still be unable to cover basic expenses each month and have to continually use a variety of coping mechanisms to meet their basic needs. This calls for appropriately modifying

the standard food security survey instrument to reflect the variety of coping strategies that low-income households typically employ. To do so would enhance the relevance of the survey for very low-income populations, thus minimizing the underestimation of food insecurity among them, and thereby perhaps inducing policy interventions that would otherwise fail to take into account the realities with which low-income households cope.

Finally, a sense of satisfaction with respect to food sufficiency positively contributes to a sense of overall happiness and welfare, although people could still be happy despite food insufficiency, thanks to their overall positive outlook on life and being content in other aspects of their lives. Certainly, overall happiness is not only an end but also a means for increasing personal and family welfare on different dimensions. The ability to meet food needs is one of the many manifestations of, and contributory factors to, overall well-being and happiness, rendering food-security enhancing policies and measures all the more consequential. Future research based on the observational, ethnographic method and larger sample sizes would undoubtedly increase our understanding of household coping strategies when faced with food insecurity, and inform strategies to formulate appropriate policies. 

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Integrating a food systems lens into discussions of urban resilience: Analyzing the policy environment

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Abstract

As discussions of urban resilience begin to include food systems thinking explicitly, researchers and practitioners must keep various considerations at

the fore. This reflective essay begins by delineating three international agreements (the Sustainable Development Goals, New Urban Agenda, and Milan Urban Food Policy Pact) that provide a broad pol-

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Authors' Note re: COVID-19

While this research and analysis was conducted before the COVID-19 pandemic, it highlights the need for more integrated urban-rural linkages to enable just and sustainable local food systems that will prove resilient in the context of shocks, including pandemics and the climate crisis. The pandemic has brought into sharp focus the vulnerability of our food system, and the critical role of food system planning to mitigate risk.

icy environment within which food systems governance might be situated. It then encourages consideration not only of megacities around the globe, but also of the approximately 2 billion people that live in towns and small- or mid-sized cities (encompassing about 27% of the world's population) (Berdegúe, Proctor, & Cazzuffi, 2014). It notes that integration of food systems thinking must enhance urban-rural linkages in mutually supportive ways, echoing recent calls from the Food and Agriculture Organization of the United Nations (FAO, 2019) and UN-Habitat (2018). It reflects on ways policies and governance might better articulate across scale and argues that deep adaptation to climate change must frame all work moving forward. Finally, it examines how food systems thinking and social innovation are critical to urban resilience and must be prioritized in policymaking rather than included as an afterthought. We draw illustrative examples from our community-based research projects carried out through the Nourishing Communities: Sustainable Local Food Systems Research Group and the Food: Locally Embedded Globally Engaged (FLEdGE) Partnership.

Keywords

Adaptation, City-Region, Food Systems, Scale, Governance, International Agreements, Urban Resilience

Introduction

By 2050, the world population is projected to reach 10 billion, and urban populations will comprise 68% of the planet's human inhabitants (UN Department of Economic and Social Affairs, 2019). While these numbers are staggering, the systems thinking required to integrate urban, peri-urban, and rural communities into coherent food systems to achieve ecological, economic, and social goals is equally, if not more daunting. Food systems can be

understood to “[encompass] all the stages of keeping us fed: growing, harvesting, packing, processing, transforming, marketing, consuming and disposing of food” (Committee on World Food Security, 2016, para. 3). A sizable body of research on food systems has identified multiple economic, social, environmental, and health problems associated with the agro-industrial food system that now have a global reach. In response to this set of problems, a multitude of initiatives aimed at addressing them have sprung up around the world (Knezevic, Blay-Palmer, Levkoe, Mount, & Nelson, 2017; Mason & Lang, 2017; Mason & Lang cited in Kevany, 2018). Some are grassroots, community-based initiatives, while others are international and policy-focused. Some have a specific food focus (e.g., the Milan Urban Policy Food Pact), while others represent more general policy efforts (e.g., the New Urban Agenda and Sustainable Development Goals). As food systems thinking gains traction, urban-focused policy-makers have made significant strides in bringing food to the fore of policy discussions, although more progress is needed.

Since its beginnings in the 1990s, ICLEI has focused on local environmental sustainability. In 2018, ICLEI refined its core mission around sustainable urban spaces and identified pathways to development centered on five themes: nature, resilience, circularity, equity and people-centric approaches, and low-carbon emissions. Given the



Food systems expert Wayne Roberts, June 22, 2018, documenting panelists via a Twitter post (@wrobertsfood), at the *Building resilient food systems: Policy across multiple scales* panel at the ICLEI World Congress 2018, in Montreal, Québec, Canada. From left to right: Irena Knezevic, Rotem Ayalon, Lori Stahlbrand, Patricia Ballamingie, Evelyn Nimmo, and André Lacerda.

gamut of this ambitious mission, it is not surprising that over the years, ICLEI has engaged with the work of RUAF Foundation. RUAF Foundation provides expertise on urban and peri-urban agriculture and city region food systems as levers for change in addressing pressures, such as food insecurity, climate change, and migration (RUAF, 2017). ICLEI and RUAF's approaches overlap with elements of other international initiatives, including the UNDP's Sustainable Development Goals (SDGs) (UNDP, 2018), the UN-Habitat's New Urban Agenda (UN, 2017), and the Milan Urban Food Policy Pact (Milan Pact, 2015).

Our essay was conceived in discussions of food policy environments that were initiated through the collaboration between ICLEI and the RUAF Foundation. ICLEI – Local Governments for Sustainability is a global organization that brings together local governments committed to sustainable development. The session on resilient food systems included presenters from three Canadian cities (Montréal, Ottawa, and Toronto), as well as from Curitiba, Brazil. The participants (all co-authors on this essay) offered perspectives on innovative local initiatives and reflected on how those initiatives *do* or *do not* intersect with policy at higher governmental levels. A subsequent panel in fall 2018 generated a productive public conversation moderated by the manager of Toronto Food Strategy, which further expanded our thinking (see Blay-Palmer, Ballamingie, Emanuel, & Schumilas, 2018). We then engaged in an iterative writing process with input from community partners. We have embedded the relevant scholarly literature into insights offered in each section.

This reflective essay explores each of these international initiatives and their explicit or implicit implications for food systems. After delineating some of the broad brushstrokes of the international policy environment through which food systems governance is framed, this essay considers policy action at municipal and regional levels and recommends several promising focus areas for food policy work. Specifically, it further develops ideas presented in the ICLEI panel and argues in favor of food systems thinking and the value of attention to midsized cities, integrative approaches to the urban-rural spectrum, deep adaptation to cli-

mate change, coherent, scale-appropriate policy and governance, and social innovation.

Policy Environment: Three Key International Agreements

Sustainable Development Goals

While the most obvious Sustainable Development Goal for food systems would be SDG 2 (zero hunger), sustainable food systems cut across all 17 goals and thus provide an integrative opportunity to connect many SDG aims and priorities. Key among these are the goals related to SDG 1 (no poverty), SDG 3 (good health and well-being), SDG 5 (gender equality), SDG 8 (decent work and economic growth), SDG 11 (sustainable cities), SDG 12 (sustainable production and consumption), SDG 13 (climate change), and SDGs 14 and 15 (life on land and in water). The SDGs are made more explicit through the 167 targets that help benchmark existing situations and measure progress. Together, these agreements, if taken seriously, provide a way to transform our food system towards increasing sustainability.

To this end, Johan Rockström and Pavan Sukhdev (2016) of the Stockholm Resilience Centre delineate “How food connects all the SDGs” and argue that food plays a central role in achieving a societal transition towards the SDGs, and in fact, constitutes a prerequisite to their success. The authors envision an integrated, layered approach to thinking about the SDGs through a food systems lens (see Figure 1). They cite various illustrative examples:

- Referring to SDG 3 (good health and well-being), they contemplate the co-benefits of a shift to plant-based diets for health outcomes and greenhouse gas emission reductions;
- Referring to SDG 6 (clean water and sanitation), they identify food production as the largest single consumer of freshwater;
- Referring to SDG 14 (life below water), they note that we cannot achieve global food security due to overexploitation of nearly depleted fish stocks coupled with warming, acidification, and plastic contami-

- nation of marine environments; and,
- Referring to SDG 15 (life on land), they estimate the current proportion of global land used for food production to be 40%—a figure projected to rise to 70% if we persist with business as usual.

Certainly, once one dons one's food systems goggles, one quickly realizes the centrality of achieving just and sustainable food and farming systems to achieving all other goals. Children must be properly nourished before they can benefit from SDG 4 (quality education), as the proponents of healthy school food programs know. Resilient urban food systems, ideally with some local self-sufficiency and fairly traded connections to global supply chains, are critical to achieving SDG 11 (sustainable cities and communities). Furthermore, and perhaps most pressingly, the Intergovernmental Panel on Climate Change (IPCC) (2018) directly urged governments to implement “rapid, far-reaching and unprecedented changes in all aspects of society” (para. 1) to limit global warming to 1.5° C. Thus, greenhouse gas emissions from the food sector, across the supply chain—which account for up to 29% of global emissions (Vermeulen, Campbell, & Ingram, 2012)—must be mitigated to address SDG 13 (climate action). Conversely, producers must adapt to now inevitable climate disruption and changing growing conditions. Rockström and Sukhdev (2016) advocate for the adoption of a new lens for looking at food, beyond simple measurements of productivity per acre, that considers jobs, health, nutrition, and culture, among other things.

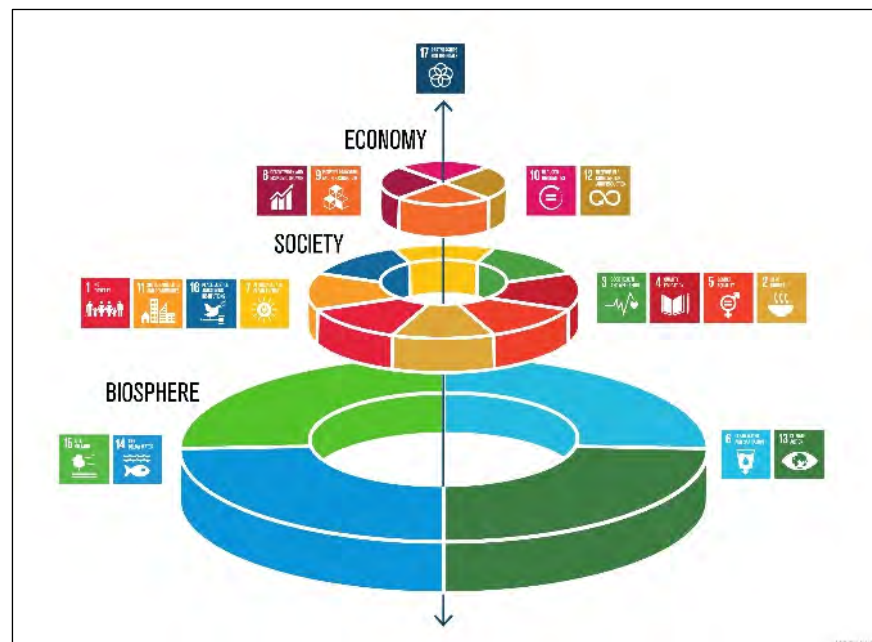
Clearly, the 17 SDGs all impact one another iteratively, and must be understood as an interconnected web. When the values em-

bodied by a goal are progressive—related to equity, equality, ecological integrity, and rights (understood broadly to include ecosystem rights and the rights of nonhuman species)—the potential for progress and transformation remains. But when the values embodied by a goal normalize the very constructs that have resulted in our current ecological crisis—the ongoing colonization of Indigenous peoples and territories, the primacy of private property over the common good, our unchallenged growth regime, dependency on extractive industries, and uncritical embrace of neoliberalism (“capitalism on steroids”)—the globalization of values can be fraught. The devil will lie in the details of *how* goals get implemented, what metrics are made visible and deemed worthy of measure, and to what effect.

New Urban Agenda

The New Urban Agenda (NUA) was developed over several years and officially signed in the fall of 2015. It was based on the premise that urban populations will double by 2050 and the recognition that despite increasing attention to sustainability, “persistence of multiple forms of poverty, growing

Figure 1. Interconnections Between Food and the Sustainable Development Goals



Source: Rockström & Sukhdev (2016); used with permission. Illustration: Azote for Stockholm Resilience Centre, Stockholm University.

inequalities and environmental degradation remain among the major obstacles to sustainable development worldwide, with social and economic exclusion and spatial segregation often an irrefutable reality in cities and human settlements” (UN, 2017, p. 2). Proponents of the NUA seek to use urbanization as a driver of positive transformation towards *sustainable cities and settlements for all*—the subtitle of the agreement.

Of the 175 paragraphs in the NUA, only one, paragraph 123, focuses on food. Specifically, it seeks to integrate food and nutrition security through attention to territorial approaches and policies to link up rural, peri-urban, and urban spaces with a focus on the urban poor. Consistent with SDG 2, its aim is to achieve zero hunger. The NUA advocates a cross-sectoral approach uniting food production, storage, processing, distribution, and marketing to make sustainable food more accessible and affordable for all. It also suggests provisions to reduce food waste and food loss; recognizes the need to integrate with other policy areas, including energy, water, health, transport, and waste; and emphasizes the critical value of genetic diversity in seeds and the importance of reducing chemical inputs. However, despite the inclusion of this paragraph and oddly specific references to discourses of food security, mitigation of food waste, seed diversity, and efficiency, food systems thinking did not prove central to the development of the NUA.

The inclusion, or lack thereof, of meaningful food system framing in the NUA informs how this governance framework is applied at the national level. In the Canadian context, the Government of Canada’s Habitat III (Canada’s national report on the New Urban Agenda), which aims to anticipate and address the challenges of rapid urbanization (Government of Canada [GoC], 2016, p. 1), makes only two explicit and exceedingly brief references to food (GoC, 2016, pp. 17, 37). Clearly, the integrative potential for a food systems lens to advance the goals of the NUA remains underdeveloped.

Milan Urban Food Policy Pact

With more than 207 signatories, the Milan Urban Food Policy Pact (hereafter the Milan Pact) focuses its efforts to support and foster food system sus-

tainability on six pillars. These pillars include ensuring effective governance, enabling sustainable diets and nutrition, improving social and economic equity, augmenting food production, producing in closed-loop ecosystem-based systems with strong links to regional cities (particularly through a robust food supply and distribution connections), and monitoring and mitigating food waste (Milan Pact, 2015). While the Milan Pact provides a voluntary framework for action, indicators have been developed to guide implementation and track progress. Three cities (Antananarivo, Madagascar; Nairobi, Kenya; and Quito, Ecuador) piloted these indicators. The preliminary results from this work, presented at the 2019 Milan Pact annual meeting, highlight the challenges of operationalizing the indicators and the place-based nature of these efforts. That said, the process of identifying place-specific indicators helped to galvanize efforts in most contexts. Moreover, the monitoring framework should encourage municipal governments around the world to adopt a city-region food systems lens by availing themselves of the CITY-FOOD experts at RUAF and ICLEI and coupling that with knowledge of local food systems actors from civil society and academia.

In addition, annual Milan Pact Awards adjudicate exemplary practices from signatory cities to recognize outstanding achievement across a range of sustainable food system categories. The organizers explain: “The cities’ practices have been selected to balance the scale of cities, diversity of practices, and regional distribution around the world. The intent is to create a representative sample of food policies and practices that [Milan Pact]... cities are implementing” (Milan Pact, n.d., para. 1). Recipients include a wide range of initiatives, from a newcomer settlement program that integrates food-handler certification and employment support in Toronto, Canada, to community dining rooms in Mexico City, Mexico, to redistribution of surplus food through food banks in Belo Horizonte, Brazil—seeking, effectively, to globalize social innovation. The awards allow municipalities and civil society actors embedded in emergent regional food networks to gain inspiration from more established networks. A recent review of applicants for the award has become a sort of com-

pendium of best exemplary practices around the world (FAO, 2018a).

The Milan Pact embodies the adoption of an integrated and holistic approach to food systems thinking. While the first round attracted considerable attention, there is tremendous promise (and untapped potential) for a second round of recruitment to encourage the mayors of small- and mid-sized centers to sign on. To wit, in Canada, Montréal, Toronto, and Vancouver have signed on, but no midsized cities have done so to date. Municipalities that have not yet realized they have a role to play regarding the food system need only look to the Milan Pact (n.d.) and/or to established regional city-food networks for inspiration (here, the work of the Food for the Cities program of the FAO [2018a] is exemplary).

This section delineated the three international agreements that comprise the broader policy environment within which a food systems lens might be implemented at the municipal level. Such initiatives signal our joint commitment to work towards shared goals, enable states to align their policies and programs with global efforts, and facilitate global connections to share exemplary practices. Moreover, international agreements can serve as levers for food systems change: they can be held up as discourses to be invoked, strategically, to advance political ends—helping civil society organizations (CSOs) and other actors to name laudable targets and possibly to shame governments for not making meaningful progress.

Each of the three international agreements reflects the unrealized potential of embracing a food systems lens. Progress would involve recruiting more small- and midsized centers to adopt the Milan Pact, conceiving the next New Urban Agenda with food systems at the fore, and identifying and using the myriad ways food systems intersect the SDGs as indicators of and levers for cross-cutting change. Such efforts would allow food systems thinking to become central to how we imagine urban futures, rather than continuing to act as an add-on or afterthought in policy-making.

Key Considerations in Applying a Food Systems Lens

We draw on our work as community-engaged scholars and practitioners to identify key considerations when applying a food systems lens. First, we discuss the merits of expanding a food system lens to deliberately include more small- and medium-sized cities. This section explores the need to do this in the context of regional food systems to enable mutually beneficial integration through more coherent approaches. We then discuss the necessary strategies of policy integration across scales and attention to place-based context as ways to enable support for a sustainable food systems lens. Finally, we stress climate change adaptation as an imperative—a driving force that should inform all policy moving forward.

Small- and Midsized Cities Must Be Considered

When discussing the role of food systems thinking in the context of urban resilience, policy-makers and practitioners must attend not only to megacities around the globe, but also to small- and midsized cities¹ (Kago, Loose, & Sietchiping, 2019). Why? To begin, Berdegué et al. (2014) explain: “Almost 2 billion people, 27% of the world’s total population or half of the world’s urban population, reside in towns and small and medium cities of up to half a million inhabitants. An additional 3.4 billion people are classified as living in rural areas, or 46% of our planet’s inhabitants” (p. 5). Thus, the sole focus on megacities misses 80% of the global population and fails to address important urban-rural interconnections (discussed below). Moreover, the authors continue: “The majority of the world’s poor, perhaps as many as 70%, live in these towns and small and medium cities and the rural areas more proximate to them, and poverty rates are also higher in small and medium cities than in large urban agglomerations” (p. 5). Just and sustainable food systems aimed at mitigating food insecurity among the most vulnerable (among other goals) must, therefore, be enacted where they can achieve the greatest effect: the city-

¹ In fact, some scholars have argued that midsized cities have the most potential “to lead an inclusive economic future that bridges the urban-rural divide” (McFarland, 2017). They argue that midsized centers offer more affordable housing, less traffic, and faster Internet service than their larger counterparts (McFarland, 2017).

region. Blay-Palmer, Renting, and Dubbeling (2015) define this scale in a RUAF publication as follows:

...the 'city region' actively challenges us to bridge the urban-rural spatial divide and connect the places where food is grown to the proximate places where food is consumed. It thus provides a territorial approach to food systems, linking a geographic space of analysis to a relevant geographic space of action for food related, but also other land use, resource management and climate change policies...an integrated food system lens is used covering all stages of food provisioning (production, harvesting, processing and distribution through to the point of retail, consumption, and food waste disposal) as well as different dimensions (social, economic, environmental, nutritional) of food systems in urban areas. (p. 3)

The importance of small- and midsized cities as a focus of food resilience is clear in Paraná State, Brazil, in which only two of the 399 municipalities have a population of more than 500,000 inhabitants, with 367 (92%) having fewer than 50,000 inhabitants. Of the 374,000 rural properties in the state, 317,000 (85%) represent small-scale family agriculture (Emater, 2013). The division between city and rural is less well defined outside of the large municipalities of Curitiba and Londrina, where small- and midsized cities are often important hubs for rural connectivity and centers of commercialization.

Pilot project work points to the value of city-region food systems for both capacity building as well as developing relevant, sustainable food systems directions. Kitwe, Zambia, provides another example; with a population of just over 400,000, it falls squarely into the small- to midsized city category. The city-region food system project in Kitwe helped build municipal capacity within by connecting people across the region. Proponents describe the inclusive approach taken:

... the food system assessment in the city-region of Kitwe was a highly participatory process promoting local ownership and buy-in for

the work through stakeholder dialogue. Some of the key players involved in shaping the local food system of Kitwe are government departments, civil society and NGOs, the private sector, research institutes and academic institutions. (FAO, 2018b, p. 77)

A task force identified key categories for enhancing sustainability in the city-region food system: value chain supports from production through processing, distribution, and waste, including recommendations about low-cost financing, inexpensive processing and storage facilities, and improved waste recycling facilities; improved understanding of social and environmental trade-offs for land use; and improved governance specifically through urban agriculture-friendly by-laws and a more decentralized approach to agriculture (FAO, 2018b).

Part of the potential of small- and midsized cities in strengthening food systems lies precisely in their multifaceted role in connecting food systems actors. Small-scale farmers located in the peri-urban and rural areas of municipalities encounter barriers to entering distribution networks in large cities that require greater supply. Distribution channels in small- and midsized cities are better positioned to work with smaller supply but still provide sizable markets. Such distribution channels are also more accessible to organizations that serve multiple producers but are still significantly smaller than corporate food conglomerates. For example, local farmers' unions, co-op markets, and other organizations actively working and providing spaces for interaction within urban areas can find it difficult to penetrate markets in megacities and logistically challenging to operate in largely rural areas. However, small- and midsized cities offer a good middle ground to scale up without jeopardizing relationships that are critical to the success of such collective efforts. Our observations to date suggest that there is much promise in this context, but more research is needed to understand the food systems dynamics at this scale.

Urban-Rural Linkages Must Be Enhanced

Next, integration of food systems thinking must enhance urban-rural linkages in mutually support-

ive ways. Even with the rural side of the equation given more explicit consideration, food remains a critical part of both conversations (Forster, Santini, Edwards, Flanagan, & Taguchi, 2015). The UN-Habitat (2018) delineates 10 guiding principles² and a framework for action to create an enabling environment for urban-rural linkages that advance integrated territorial development. These are based on “new, inclusive approaches and enhanced synergies between urban and rural communities and spaces” (UN-Habitat, 2018, para. 1). Invoking both the SDGs [notably, SDG 11 (sustainable urbanization)] and the NUA, this body recognizes “the reciprocal and repetitive flows of people, goods and financial and environmental services” (UN-Habitat, 2018, para. 2) within integrated territories. Thus, urban, peri-urban, and rural areas—understood together as a city region—are interconnected and interdependent in myriad ways. Thinking holistically about how a city-region food system overlays on these flows of people, resources, and ecosystem services helps ensure it remains connected, inclusive, and functional.

In the context of urban resilience, ensuring a supply of food produced as locally as possible is the key to having a stable food supply that can be distributed to an urban population as quickly as possible—especially critical in cases of extreme weather events or other disasters. In order to achieve this, urban-rural linkages must be enhanced, with agricultural lands preserved as close to city limits as possible (which may involve a moratorium on urban expansion into arable lands). Protection of peri-urban agricultural land not only augments local food distribution, but also preserves biodiversity near cities, enhances local economies, and reduces greenhouse gas (GHG) emissions from food transport. For context, we provide three illustrative examples: Montréal’s agricultural zone, Brazil’s national food programming, and Ontario’s Golden Horseshoe Food and Farming Alliance.

In 2015, the city of Montréal released a plan

for the development of its agricultural zone (Communauté métropolitaine de Montréal, 2015). Some of the main orientations include ensuring long-term agricultural production capacity near the city, encouraging the development of multifunctional agricultural activities, and integrating commercial agricultural activities into industrial and commercial zones in the city. This kind of forward thinking and planning will enhance urban-rural linkages, and in so doing, help the city become more resilient. To support this plan, Québec’s Ministry of Agriculture, in partnership with the city of Montréal, has signed an agreement to develop the bio-food industry within and around the city (Cabinet Minister of Agriculture, Fisheries and Food, 2019). This agreement aims to support projects and reinforce partnerships and collaborations within the sector. Projects include a study on the economic potential of commercial urban agriculture, a proposed congress on innovation in the bio-food sector, and a feasibility study on neighborhood solidarity grocery stores.

Food and agriculture continue to be central themes across various initiatives in Montréal, due to increasing momentum of food system actors working together—leading up to and following the creation of the Montréal Food Policy Council (the Conseil du Système alimentaire Montréalais). In 2019, the city of Montréal won the Canadian Smart Cities Challenge, a contest aimed at empowering communities to adopt a smart cities approach to improve the lives of their residents through innovation, data, and connected technology. Montréal’s proposal focused on enhancing local production, distribution, storage, and transformation to utilize existing resources better to support the vast number of actors in the food system. The proposed activities included the development of a technological platform, a large greenhouse, and improvements to farm-relevant information delivery. The platform (to manage inventory, sales, food donations, and deliveries) will facilitate easier purchasing of local food, mitigate food waste, and reduce costs. The

² According to the UN-Habitat (2018, para. 7-16), integrated territorial development should be guided by the following principles: 1. Ground interventions locally; 2. Innovate governance structures; 3. Integrate spatially and functionally; 4. Practice inclusive finance; 5. Make partnership permanent; 6. Honor human rights; 7. Provide social protection and do no harm; 8. Be socially inclusive and participatory; 9. Stay action oriented; and 10. Embrace and adapt the data revolution.

greenhouse will produce up to 3,000 tons of fresh fruits and vegetables annually, some of which will be designated for local community food centers. The greenhouse will also use waste heat from a landfill and provide professional training for youth. A smart cities challenge to improve information about supply and demand will benefit peri-urban farms on the West Island of Montréal to increase their productive capacity. Finally, the city of Montréal facilitates collaboration among diverse organizations to more efficiently and effectively improve the quality of food accessible to vulnerable populations (Ville de Montréal, n.d.).

In Brazil, national programs such as the Food in Schools (*Programa Nacional de Alimentação Escolar*, PNAE) and the Food Acquisition Program (*Programa de Aquisição de Alimento*, PAA) have been integral to creating connections between rural communities, peri-urban areas, and cities. The PNAE, for example, purchases food for municipal schools, and 30% of the produce must come from family agriculture. In Paraná State, traditional agroforestry and agroecological systems that include production of *erva-mate* (yerba mate; a tea commonly consumed in southern South America), along with a range of other native food crops such as manioc, beans, and dairy, are an important element in meeting the needs of these national programs. Not only do they produce many of the food products grown in peri-urban and rural areas, but they also contribute significantly to food consumed in local urban centers. Because these traditional family farm systems often include agroforestry and agroecological practices, they have been important in maintaining forest cover in southern Paraná, a state that has suffered extensive deforestation, with only about 1% of its original forest cover remaining as primary forest (Castella & Brites, 2004, Vibrans, McRoberts, Lingner, Nicoletti, & Moser, 2012). These forest environments and agroecosystems also offer important ecosystem services that are necessary for urban resilience and human health, including clean water, carbon capture, enhanced biodiversity, and nutrient cycling. Thus, it is important to consider changes in government priorities that can inadvertently undermine existing programs; clearly, caution is required when relying too heavily on one market.

In Ontario, the Golden Horseshoe Food and Farming Alliance (GHFFA) brings together food system actors from the region of southern Ontario known as the Golden Horseshoe, which includes several municipalities (Toronto among them), and the surrounding rural area, to discuss common interests and develop collaborative projects. One of the successful initiatives is the “Serving Up Local” project to increase local food procurement in municipally operated facilities (GHFFA, n.d.). In fact, Toronto serves as a pilot city and partner for the RUAF City-Region Food System project. Adopting the Greater Golden Horseshoe as its boundary, Toronto seeks to identify key gaps in the regional food system as one way to capture GHFFA expertise and connections. Notably, the city generated a key policy initiative from this assessment: to develop midscale distribution infrastructure to better connect the urban and rural spaces (Miller & Blay-Palmer, 2018).

Policies and Governance Must Better Articulate Across Scale

How to effectively connect policy across scale remains an ongoing challenge. It requires iterative views from the top down and bottom up, involving local-level, grassroots actors with broader perspectives and policy leaders and decision-makers with on-the-ground, local experience and an understanding of the role they can play in the food system.

Within the framings of the Milan Pact, NUA, and SDGs, various panelists recognized the need for policies and governance to better articulate across scale. They cited instances where national policies do not necessarily filter down to connect with grassroots actors, on-the-ground struggles, and lived experiences. Sometimes policies get stuck at the federal level and do not effectively reach the people. And sometimes communities and municipalities have insufficient resources to pitch a project to the federal government to secure funding (in this regard, some communities are better organized than others, and their ability to secure resources inadvertently generates a landscape of uneven development). All agreed that consideration of how these policies get implemented can be very grassroots, place-based, and context-specific. For exam-

ple, Toronto has analyzed overlapping SDG and Milan Pact indicators to assess its revised food strategy during its 2018 review process (Toronto Public Health, 2018).

In reflecting on the need for stronger mechanisms of accountability at, for instance, the city level in relation to national-level commitments, Barbara Emanuel, manager of the Toronto Food Strategy, wondered *how* (and *whether*) these agreements articulate between local and global scales (and all the scales in between). In June 2019, the government of Canada announced its food policy for Canada,³ and, in the context of this discussion, there are two points of caution. First, national food policies must support and be informed by municipal food systems actors. Regardless of scale—whether municipal, provincial, national, or international—effective co-governance (in this case, the involvement of multiple stakeholders in decision-making regarding policies and programs related to food) increases both deliberative democratic process and urban resilience (Ballamingie, 2018), and could provide insurance against shifts in political priorities as governments change. Second, there must be consideration of how these policies get developed⁴ and implemented, for this can be very grassroots and contextualized.

In Brazil, the implementation of national policies such as PNAE faces challenges at the local level. This is because most small-scale producers who have traditionally planted organic and agroecological gardens do not have the capacity to meet the needs of the program. To address this, local farmers' unions have worked with small-scale farmers to develop cooperatives that bring several families together to meet the demands of the program. Local grassroots initiatives are essential in implementing these national policies, so policies need to be flexible enough to deal with local realities, particularly in terms of food. For example, small-scale farmers faced challenges providing the quantity or type of foods outlined in the contracts, leading to a criminal investigation of diversion of

funds from the national programs by local cooperatives in 2013 (Fernandes, 2017). While all those imprisoned were eventually exonerated, such an example shows the need for flexibility in applying national policies to local realities. The case had a major impact on many communities, some of which no longer belong to the program, leaving the families without an important source of income. Although these programs have seen much success across Brazil (and in Paraná, they will continue through 2020), new government policies that favor large agribusiness are threatening their long-term continuation, and as such the economic and socio-environmental outcomes of many small-scale farmers in the country are in jeopardy.

There Is No "One-Size-Fits-All" Solution

A note of caution goes to funders and policymakers when contemplating how to implement global objectives at the local level, or, conversely, how to scale up and/or diffuse out successful local projects to broader or different geographic contexts. Our extensive work as a community of scholars and practitioners has repeatedly highlighted that a diversity of models may be more appropriate for differently sized centers. As a civil society colleague posited, "Funders often require replication models as the basis of collective impact change, but projects that work well in one location rarely translate in ways that are effective, or place-appropriate to another without allowance for critical re-design to fit the social, political, cultural and environmental context" (M. Garahan, personal communication, November 1, 2018). Thus, enthusiasm to translate projects from one geopolitical or cultural context to another, or from one scale to another, should be tempered by respect for the specificity of place and scale—including the unique constellation of existing actors working on related topics in each context. As examples, Sonnino, Marsden, and Moragues-Faus (2016) argue in favor of a place-based approach; Marsden (2013) reflects on place-based governance considerations; Mount and An-

³ For insights into governance recommendations emerging from the national food policy development process, see analysis by André, Coulas, & Ballamingie (2018).

⁴ See the work of urban planner, Yves Cabannes, on participatory budgeting (Cabannes & Lipietz, 2017) and the integration of food in urban planning (Cabannes & Marochinno, 2018).

drée (2013) visualize the intricacies of community-based food initiatives in Ontario; and Flora, Flora, and Gasteyer (2015) found that adapting models to local contexts helps to avoid failure.

As an illustrative example that emerged during the panel discussion, a representative from Nutrition International questioned how to facilitate food policy councils in non-industrialized (“developing”) countries. We discussed how some of the most celebrated examples from industrialized countries might offer only limited lessons to efforts in non-industrialized contexts. For instance, the Toronto Food Policy Council, formed in 1991, is recognized as a pioneer in the field (see Blay-Palmer, 2010; Mah & Baker, 2013).⁵ But we noted that while these models work well in a Canadian context and elsewhere, they hardly represent a “one-size-fits-all” solution and should therefore be assessed for their appropriateness on a case-by-case basis. A representative from the Global Alliance for Improved Nutrition echoed our reply, noting that in some places there are existing structures that can be adapted for better urban policies, rather than starting a food policy council from the ground up (Ballamingie, 2018). From our FAO-RUAF-LCSFS/FLEdGE City Region Food Systems work, we learned the tremendous benefit of convening multistakeholder groups across scales to tackle problems (such as food access or food waste) together. Of course, attention to such specificities and reconciliation of multiple perspectives takes time, patience, and flexibility, but fortunately, there is an increasing number of exemplary practices to draw on.

Deep Adaptation to Climate Change Must Frame All Work Moving Forward

Finally, the imperative to adapt deeply and proactively to climate change has come to the fore of public consciousness, and ICLEI recently released a response to the IPCC’s (2018) dire warning. First, ICLEI’s (2018b) call for “more ambitious national targets that align to the 1.5-degree scenario” (para. 5) encourages close examination of ways to mitigate GHG emissions associated with conventional

mainstream agriculture, in addition to the role of ecological and regenerative agriculture in carbon capture and sequestration. Second, ICLEI’s advocacy for a “strong urban perspective in climate science and policy” (para. 6), underlies the role that just and sustainable local food systems might play in achieving that. Third, ICLEI’s vision for a “full reorientation towards multi-level climate governance” (para. 7), requires the effective articulation of policy across scale—started in the Talanoa Dialogues between cities and regions and national governments. Fourth, ICLEI’s call for “a rapid, all-hands-on-deck transition to achieve climate neutrality and a fully decarbonized economy” (para 8), demands a timely transition to renewable energy and divestment from fossil fuels, as well as serious examination of the critical role ecological agriculture might play in achieving carbon neutrality. Fifth, ICLEI’s demand for “action on urban resilience that addresses severe possible climate impacts, based on at least a 2-degree scenario” (para 9), highlights the obvious: food lies at the foundation of Maslow’s hierarchy of needs, and deep adaptation to a rapidly changing climate should prioritize human food security, if only to mitigate suffering.

Considering that small-scale traditional erivate producers in southern Brazil have been responsible, in part, for conserving important natural forest resources and native food seed banks due to their use of agroforestry and agroecological practices, it is clear that they play a key role in helping to mitigate the coming effects of climate change (Nicholls & Altieri, 2019). However, these systems are being threatened due to misinformed policies focused on monoculture and antagonism between farmers and government environmental agencies, particularly in terms of the extremely strict laws forbidding forest management. Policy and government research and outreach agencies must reframe their relationship with these small-scale producers to support them as stewards of forests and biodiverse agroecosystems. This could help ensure that the biodiversity, water, and carbon capture services provided by these agroecosystems are maintained around urban centers. Grassroots initiatives,

⁵ Though others, such as the Knoxville-Knox Food Policy Council pre-date its formation by almost a decade, having been formed in 1982 (Knoxville-Knox County, n.d.).

such as heirloom seed saving and exchange programs among small-scale family farms, require further institutional support and expansion so that the wide diversity of native food varieties continues, which in turn will enable food crops to adapt to future climate transformations, improving urban and rural resilience.

Urban Resilience Must Be Reframed to Include Food Systems Thinking and Social Innovation

As Ballamingie (2018) argues, since ICLEI's inception, urban resilience and sustainability have largely been framed in terms of climate change mitigation and adaptation. But as food system scholars and practitioners know, food serves as a portal to myriad socio-economic and environmental issues. Cities play a crucial role in achieving food security, optimizing health, and advancing environmental sustainability. Municipal food access programs target predominantly urban populations, where they prove most effective and efficient to deliver. At this level, direct engagement with citizens can be more comprehensive and meaningful, and citizens can better appreciate the social and environmental value of policies and programs that have a visible effect on their communities.

ICLEI and RUAF joined forces in 2013 to create the CITYFOOD network during the Resilient Cities Congress in order to advance "local and regional government action on sustainable and resilient city-region food systems by combining networking with training, policy guidance and technical expertise to its participants" (ICLEI, 2018a, p. 3; RUAF, 2017, para. 1). CITYFOOD became operationalized in 2017 to provide online (e.g., through webinars) and face-to-face (e.g., through international meetings such as the Milan Pact annual gathering) opportunities to network and share information. Willing to work with both established and emergent city-region food systems, ICLEI and RUAF argue that sustainable and resilient city-region food systems are critical, and ultimately serve to:

Enhance food security and nutrition for all;

Improve livelihoods of urban, peri-urban and regional food producers, especially women, youth and other vulnerable groups; Promote job creation, with an emphasis on green jobs, through local and regional production, agro-processing and marketing; Protect and restore ecosystems and natural resources, including biodiversity, air, soil and water quality; Reduce greenhouse gas emissions through climate friendly production, transport, processing and consumption of food; Advance climate change adaptation by greening cities through urban and peri-urban agriculture; Support the achievement of national and international goals and agendas, such as the Paris Agreement, the Sustainable Development Goals, the New Urban Agenda and the Milan Urban Food Policy Pact (ICLEI, 2018a, p. 4); Reduce food waste and losses and promote safe reuse of organic waste and wastewater; Increase the resilience of the food system by diversifying food supply sources and building resilient food production, transport, storage and marketing systems; [and,] Facilitate public-private-civil society participation by engaging stakeholders in food governance across sectors and levels of government. (ICLEI, 2018a, p. 5)

During the ICLEI World Congress 2018, the program sought to accommodate and feature priorities identified by ICLEI regional offices and partners. The food systems team worked to ensure food served as a cross-cutting theme, highlighted in other sessions, workshops, and high-level discussions, as well as during site visits⁶. Moreover, food systems have been a core theme of Resilient Cities Congress since its inception with dedicated forums and track of sessions in almost every edition of the congress.

In fact, these goals are not unique to ICLEI or RUAF. Several other initiatives around the world offer similar visions, from global initiatives like the Milan Pact to local measures like the Toronto Food Charter. Local governance offers unique pathways to achieve more just and sustainable food

⁶ To view the featured sessions associated with the theme, Sustainable and Resilient City-Food Systems, see <https://worldcongress2018.iclei.org/sustainable-and-resilient-city-region-food-systems/>

futures as they provide space for place-based innovation.

Innovation Must Include Social Aspects

In contrast to social innovations possible through place-based local governance, national governments emphasize innovation across sectors—what they typically refer to as technology development. For example, in Canada, the federal government has developed an innovation plan, *Positioning Canada to Lead: An Inclusive Innovation Agenda* (GoC, 2016), that aims to foster “a confident nation of innovators—one that is globally competitive in promoting research, translating ideas into new products and services, accelerating business growth and propelling entrepreneurs from the start-up phase to international success” (para. 3). Community food initiatives and small agri-food enterprises are sites of significant innovation, which includes social innovation alongside business and process innovation (Agri-food Economic Strategy Roundtable, 2018; Knezevic et al. 2017; Stephens et al., 2019). However, a closer look at the Canadian government’s agenda uncovers a focus on digital technologies, green technologies, commercialization of ideas, acquisition and training of talent, and investment in research superclusters. All five research superclusters funded under this agenda in 2018, in the first round of funding, were digital technology superclusters (GoC, 2018), although two included some aspect of food systems (Protein Industries Supercluster, and the fisheries and aquaculture components of the Oceans Supercluster; see GoC, 2018). In other words, officially, innovation has become synonymous with new technologies, despite the growing public attention paid to social innovation (see, for instance, CSI, n.d.). Initiatives at local and regional levels, as the prior sections illustrate, offer more space for inclusive and multifaceted innovation. Lessons from successful on-the-ground initiatives demonstrate that a broader approach to innovation can have a greater impact on social and environmental sustainability without compromising economic well-being—all of which is essential to greater urban resilience.⁷

Conclusion

This essay has sought to demonstrate the value of integrating a food systems lens into discussions of urban resilience, considering three key international agreements: the Milan Urban Food Policy Pact, New Urban Agenda, and Sustainable Development Goals. Food systems thinking holds tremendous integrative potential to address myriad, complex, and thorny issues at once, and can no longer be relegated to an afterthought.

Drawing on diverse examples, various prescriptive recommendations and calls to action emerge from this work. Small- and mid-sized cities must be considered as key sites through which food systems are enacted, potentially affecting significant portions of the global population (illustrated by a pilot project in Kitwe, Zambia). Urban, peri-urban, and rural linkages across the city-region food system must be enhanced (here, Montréal’s planned agricultural zone and smart cities approach hold promise). Policies and governance must better connect and translate across scale, with appropriate mechanisms in place to monitor progress and ensure accountability. However, mechanisms to achieve goals cannot be “one-size-fits-all.” Thus, enthusiasm to translate projects from one geopolitical or cultural context to another, or from one scale to another, should be tempered by respect for the specificity of place and scale, including the unique constellation of existing actors working on related topics in each context. Certainly, the Milan Pact tries to do this by recognizing the myriad distinctive ways cities engage with food and the critical role food plays in adapting to economic, environmental, social, and political challenges. This insight is also consistent with UN-Habitat’s (2018) guiding principle to “ground interventions locally” (para. 7). Next, deep adaptation to climate change must frame all food systems thinking moving forward. And finally, innovation must be conceived of beyond the narrow construct of technological advancement to include social and ecological innovations. Since many jurisdictions still lack food policies, we hope these insights will be useful as they advance in their adoption of a food systems lens.

⁷ For examples of such initiatives, see the Social Economy of Food video series on the Laurier Centre for Sustainable Food Systems YouTube channel or visit <http://nourishingontario.ca/the-social-economy-of-food/social-economy-of-food-video-series/>


Thinking strategically while moving forward, first, mayors and municipal governments around the world should adopt a city-region food systems lens by availing themselves of experts (vis-à-vis CITYFOOD, RUAF, and FAO) and coupling that with knowledge of local food systems actors from civil society and academia (Kago et al., 2019). In this regard, future research into the benefits of adopting a food systems lens broadly, and into motivations for small- and mid-sized cities to sign onto the Milan Pact specifically, would be of value.

Second, the governance of municipal food systems is best achieved through participatory and collaborative processes that bring together diverse stakeholders. The Toronto Food Policy Council, founded in 1991, remains a leading example. It is based within and funded by the city of Toronto and gives community members and food system experts a role in advising the municipal government on food issues. Case studies of exemplary practices in this and other more established municipal food policy councils could serve to inform more emergent governance bodies.

Third, initiatives to interconnect food policy actors must be supported. In this regard, the work of the Food Policy Networks (n.d.), a project of the Johns Hopkins Center for a Livable Future, is notable in North America. In British Columbia, Kent Mullinex and colleagues at Kwantlen Polytechnic University (KPU) have developed a comprehensive food system policy database (KPU, n.d.), and the Food Communities Network⁸ recently emerged as a bilingual, pan-Canadian network aimed at building food resiliency. Such initiatives connect actors across the country who are seeking to engage effectively in food systems governance, network and share best practices, build capacity, create a database of policies, diffuse social and environmental innovations, enable compara-

tive research, and aggregate technical assistance.

Fourth, it will be necessary to engage planners and planning departments as critical actors in urban policy-making and urban design. Notably, Growing Food Connections, an initiative aimed at “developing an educational framework for the next generation of food systems planners” (GFC, n.d., para. 1) led by Samina Raja and Jill Clark in the United States, seeks to ensure the necessary formation.

Moving forward, our goal as a research collaborative will be to formally encourage food systems thinking in discussions of urban resilience, governance, and related policies. This essay has offered a high-level analysis of the policy environment within which a food systems lens might be applied and argued the (as yet unexplored) potential of doing so. The adoption of a food system lens involves a paradigm shift that will move food analysis and action to the next level. 

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⁸ For more information, see <https://foodcommunities.ca/>

⁹ For more information, see <https://researchcentres.wlu.ca/centre-for-sustainable-food-systems/index.html>

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Advancing ideas for farmers market incentives: Barriers, strategies, and agency perceptions from market managers

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Abstract

Florida's Fresh Access Bucks program provides incentives to Supplemental Nutrition Assistance Program beneficiaries to redeem fresh, locally grown fruits and vegetables at select farmers markets. Policy-makers and practitioners designed the pro-

gram to improve access to fresh fruits and vegetables for limited-resource families while stimulating the local economy by supporting purchases from local farmers. While evidence suggests that related incentive programs improve access to nutritious food, there is currently little research regarding farmers market managers' perspectives and experiences regarding program adoption and use, despite the critical role played by managers in administering the program. Using data collected from semistructured phone interviews with market managers, we applied a component of the Integrated Behavioral Model to explore the barriers managers face in engaging with limited-resource consumers at their markets through the Fresh Access Bucks program. Additionally, we explored managers' perceptions of their ability to administer and market the program effectively through strategic interventions. Results indicate that market managers' perception of their ability to administer the program was hindered by the following external environmental factors: *bureaucratic limitations; availability of locally eligible producers and growers; organizational*

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structure and funding support; and transportation and physical access. The following strategic efforts influenced manager perceptions of their ability to administer the program: *risk-taking and experimentation; loyalty, trust, and relationship-building with vendors; cultivating market experiences; and strategic coordination with partner organizations.* These findings have implications for improving outcomes for similar nutrition incentive initiatives at farmers markets.

Keywords

Barriers, Farmers Markets, Food Access, Market Managers, Nutrition Incentives, Personal Agency, SNAP, Low-income Consumers

Introduction and Literature Review

Limited-resource individuals in the United States struggle to access and purchase fresh fruits and vegetables, and evidence suggests that the gap in food access between high- and low-income status populations is widening. From 2000 to 2014, the number of food-insecure households grew by nearly 33% (Elmes, 2016). The U.S. Department of Agriculture (USDA) defines food insecurity as a condition of limited, uncertain, or inconsistent access to nutritionally adequate and safe foods (USDA Food and Nutrition Service [USDA FNS], n.d.-a). While the U.S. saw a net improvement in diet patterns from 1999 to 2010, gaps in dietary quality observed between adequate- and limited-resource populations widened significantly during this period (Wang et al., 2014). Limited-resource refers to low-income populations that additionally lack consistent access to critical infrastructure and resources, such as transportation and health care (Ver Ploeg et al., 2009). Researchers have found that determinants such as race, ethnicity, gender, education level, and income status influence unequal access to fresh, nutrient-dense foods (Ver Ploeg et al., 2009). While these variables are important in terms of understanding nutrition disparities at a broad level, researchers have identified income as having the strongest association with diet and nutrition disparities within a population (Wang et al., 2014). Researchers consider the point-of-sale price for nutritious fresh fruits and vegetables to be a central determinant of access, as fruits and vegetables typically cost more than unhealthy

foods in the U.S. (Bernstein, Bloom, Rosner, Franz, & Willett, 2010). Poor nutrition from inadequate fruit and vegetable consumption, therefore, can be principally characterized as an issue of economic access.

Roughly 40 million limited-resource Americans received food assistance from the Supplemental Nutrition Assistance Program (SNAP) in an average month in 2017 (Center on Budget and Policy Priorities, 2018). While SNAP has improved general access for eligible individuals, it has done less to address the income-related disparities in dietary quality (Leung et al., 2013). SNAP-eligible individuals, in other words, have not experienced appreciable dietary improvements through program use over time. In fact, a review of nationally representative data found SNAP users to have lower dietary quality than their non-SNAP, income-eligible counterparts (Nguyen, Shuval, Njike & Katz, 2014). Despite increased efforts to regulate SNAP-approved low-nutrition foods, the low cost of these items makes them more accessible to limited-resource shoppers. Current SNAP purchase allowances include soda, energy drinks, candy, cookies, cakes, and ice cream (USDA FNS, n.d.-c). Limited-resource shoppers are increasingly encouraged to redeem their SNAP benefits for fresh fruits and vegetables at farmers markets, defined here as a fixed location-space where grower-producers can sell their agricultural products directly to the general public, to help reduce the financial barrier of accessing higher-nutrient fresh fruits and vegetables (Kirkpatrick, 2012; USDA FNS, n.d.-b).

Efforts to promote and expand SNAP access at farmers markets, however, have had mixed success. A USDA report suggested that farmers markets were an under-utilized retail outlet for SNAP registered, limited-resource individuals in the fiscal year 2017, representing only .02% of the total SNAP benefit redemption amount nationally (USDA FNS, n.d.-a). To address this challenge, the USDA has begun to promote incentive-matching programs at markets to increase fresh fruit and vegetable consumption across the country (Dimitri, Oberholtzer, Zive, & Sandolo, 2015). Policymakers and program developers have designed these programs to encourage the redemption of federal assistance benefits such as SNAP for locally grown

fresh fruits and vegetables in states across the country. The Gus Schumacher Nutrition Incentive Program (GusNIP) grant, for example, funds a variety of nutrition incentive programs intended to provide a dollar-for-dollar match of SNAP benefits toward the purchase of fresh fruits and vegetables (Roskos, Wengreen, Gast, Leblanc, Durward, 2017).

Researchers have previously explored the impact of nutrition incentive programs for limited-resource consumers. In a case study examination of low-income New York City neighborhoods, Olsho, Payne, Walker, Baronberg, Jernigan, and Abrami (2015) found a positive effect of the Health Bucks incentive program on awareness and use rates of farmers markets. Grace, Grace, Becker, and Lyden (2008) found that a local nutrition incentive program positively affected limited-resource shoppers' motivation to use their federal benefits at markets in Portland, Oregon. Similarly, Dimitri et al. (2015), exploring the impact of incentive vouchers on fresh fruit and vegetable consumption rates, found an increase in vegetable consumption for limited-resource participants after voucher distribution. In addition to consumer-focused research, some studies explicitly focused on market manager perceptions and behavior. Hasin and Smith (2018) recently engaged the market manager population in a survey-based study that applied the Diffusion of Innovation Theory, finding that institutional collaboration positively influenced the likelihood that managers would adopt SNAP/Electronic Benefits Transfer (EBT) at markets. Roubal, Morales, Timberlake, and Martinez-Donate (2016) explored EBT implementation at farmers markets and found that personal motivations, explicit market mission statements, and streamlined reimbursement procedures helped to facilitate successful EBT use. Both studies recommended a continued focus on managers to improve programmatic outcomes such as SNAP redemption rates.

Our study follows these recommendations to explore how managers administered and marketed a Florida-based nutrition incentive program known as Fresh Access Bucks (FAB) to SNAP shoppers. The purpose of this study was to consider market managers' perceptions of their ability to effectively administer and promote the FAB nutrition incen-

tive program to SNAP shoppers, given programmatic barriers. We investigated logistical and environmental challenges for managers, including daily management tasks such as staff and vendor training, record keeping, outreach, promotion, and the leveraging of grant funds to maximize impact for the market. Two core research objectives were to (a) explore manager perceptions of control through the identification of FAB program barriers and (b) explore manager perceptions of self-efficacy to administer the FAB program through strategic interventions. In pursuing these objectives, we argue that applying a behavioral theory to target and highlight managers' sense of control, efficacy, and agency serves as a useful means for both academic researchers and practitioners to better understand program implementation at farmers markets and the complex expectations and strains associated with the process. Broadly, our study joins an emergent strand of literature that focuses on farmers market managers as an understudied population segment and recognizes them as critical actors in the wider effort to provide affordable food access to low-resource communities. In this paper, we use formative results from objectives (a) and (b) above to communicate the relevance of managerial perspectives and experiences in nutritional promotion efforts.

Applied Research Methods

We designed this analysis as an instrumental case study of Florida-based market managers who administered the FAB nutrition incentive program at select markets. According to Merriam and Tisdell (2015) and Yin (2003), a case study is a bounded system as a unit of analysis designed to explore and describe a material setting, space, time, or context with the intent of advancing its understanding. In our study, the case (i.e., the unit of analysis) was the sample of market managers bound by their shared engagement with the FAB nutrition incentive program at their respective farmers markets in Florida. Beyond being recognized as a bounded unit of analysis, Baxter and Jack (2008) argue that researchers should consider employing a case study when contextual conditions are salient to the phenomenon under study. In our study, a host of contextual factors influenced (i.e., facilitated or

constrained) the degree of control and agency managers felt they had to administer FAB and effectively engage low-resource shoppers. In this sense, we believe it is “impossible to separate the phenomenon’s variables from its context” within our study (Merriam & Tisdell, 2015, p. 38). We additionally positioned this case study as instrumental because it aims to address a broader social issue, namely, to improve managers’ experiences with nutrition incentive program administration and to improve outcomes for the individuals and communities that rely on these types of incentives (Stake, 1994).

FAB is a program designed to incentivize SNAP shoppers to redeem their benefits at participating markets to purchase fresh fruits and vegetables directly from Florida farmers (FAB, n.d.). The program provides a dollar-for-dollar match to what a SNAP beneficiary redeems. Shoppers can swipe their EBT cards in exchange for FAB tokens, which they can redeem for locally grown fresh fruits and vegetables. Tokens may be used immediately or saved for future use at participating markets. FAB, which was funded by the USDA’s GusNIP grant, was enacted to provide financial support for state-level organizations to address fruit and vegetable access barriers for SNAP-eligible communities (USDA National Institute of Food and Agriculture, n.d.). At the time the study was conducted, the 501(c)3 nonprofit organization Florida Organic Growers (FOG) was the recognized GusNIP grantee that administered the FAB program in-state.

The target population for this study was managers overseeing the administration of this program at select farmers markets in Florida. The administrative responsibilities of managers included the supervision of staff and vendor training, record keeping, outreach, promotion, and grant fund allocation to maximize impact for the market. We secured Institutional Review Board (IRB) approval before contacting market managers. We then solicited participation through both email and direct phone calls, using contact information obtained from publicly accessible sources. A total of 13 managers ultimately agreed to participate in one-on-one semistructured phone interviews. Eleven of the 13 participants were female, and two were

male. At the time of data collection, approximately 50 markets across 23 counties partnered with FAB in Florida. Participants operated a diverse range of market types across rural, urban, and semi-urban areas. We classified markets as either private entities, nonprofits, or grower association collectives. We additionally classified markets as supported by a local Chamber of Commerce, a community redevelopment agency, or some combination of this arrangement. Participants included in this study represented markets in 10 counties in Florida. We employed a purposive sampling of participants, targeting individuals over 18 years old in the role of market managers offering SNAP and FAB program access at their markets. We initially contacted 40 managers who had adopted FAB for participation. With certain markets ineligible for inclusion (i.e., no longer in operation or no longer offering SNAP or FAB access to customers), a final total of 13 participants agreed to participate in the study.

We used a semistructured questionnaire instrument for data collection. We designed primary questions to allow for open-ended “probe” opportunities, which were triggered depending on the direction of the discussion. Phone interviews ranged from 35 to 90 minutes in length which were recorded, transcribed, and coded. We continued collecting data until we felt we had reached data saturation, which occurs when the researcher is no longer receiving and documenting new or unique information from participants (Glaser & Strauss, 1967).

To support and structure the emergent themes elicited from managers, we applied the Integrated Behavioral Model (IBM) as a theoretical framework and an analytical frame. The IBM integrates two prior theoretical models describing individual motivational factors that influence the likelihood that an individual will perform an action or behavior (Montaño & Kasprzyk, 2015). The IBM, like the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (Ajzen, 1991), states that behavioral intention is the most significant factor in whether one performs a behavior in a given context (Montano & Kasprzyk, 2015).

We leveraged a core construct from within the model to highlight and clarify determinants of be-

havioral intention and those perceptual factors that emerged organically from interviews with market managers. The “personal agency” construct is itself divided into two components: perceived control and self-efficacy. Perceived control refers to one’s perception of the degree to which certain environmental variables make performing a behavior easy or difficult. Self-efficacy is the degree of confidence one has in their ability to perform a behavior given perceptions of difficulty from environmental obstacles or external constraints (Bandura, 2006). We applied the perceived control and self-efficacy variable components to our emergent themes for conceptual consistency. Reference to these variables guided the analysis process and ultimately helped to structure the final thematic categories used in the study.

We applied the constant-comparative method (Glaser & Strauss, 1967) to identify and explore pertinent themes related to our objectives. First, we recorded and transcribed interviews for analysis. We then uploaded transcript files through a qualitative data analysis software program (NVivo Version 12.3.0.). We classified and arranged information and examined relationships in the data within the program. We began to organize code construction by establishing first-tier codes. Our first-tier codes reflected control and efficacy-ori-

ented questions used in the semistructured interview protocol.

In the second phase, we identified emergent codes to represent concepts, themes, and meaningful patterns that emerged within each participant case. We nested thematic codes in this phase within the broader question-category codes from the previous phase. Throughout the process, we renamed, re-ordered, and scrutinized newly identified codes to ensure their relevance to the objectives of the study.

We applied selective coding as the final coding step within the constant-comparative method. Selective coding is a procedure to relate code categories to one another, validating relationships between them, and adding detail to categories that need further refinement and development (Kolb, 2012). The process of category formation, comparison, and rearrangement continued until every participant’s case had been thoroughly analyzed, and we felt we had adequately represented the study’s two main objectives in the final structure of thematic codes (Table 1).

Employing the peer-debrief process was critical to achieving consensus. According to Lincoln and Guba (1985), peer debriefing “is a process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and to explore

Table 1. List of Thematic Codes Relating to Objectives A and B

Perceived Control: Program Logistics and Constraints	Self-Efficacy: Internal Market Strategy
Bureaucratic limitations (rules and regs)	Audience segmentation and targeted messaging
Capacity of market space	Consumer education
Communication and support from program facilitators	Cultivating market experiences/activities
Consumer education and exposure to nutrition and seasonal foods	Data tracking and accounting
Funding for equipment use and marketing	Grassroots and word-of-mouth engagement
Grocery, online retailers and other markets as competition	Internal rewards program and incentive offerings
Initial consumer outreach and exposure	Relationship building with vendors
Lack of awareness of organizational collaboration	Risk-taking and experimentation
Locally eligible growers and producers	Social media and paid advertising
Organizational structure and level of support	Strategic coordination with partner organizations
Public support and understanding of SNAP	Vendor contract and policy enforcement
Staffing and time for data entry and marketing	
System abuse and fraud	
Transportation and physical access	

aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind" (p. 308). Within each stage of the analysis process, the lead researcher drafted debrief memos to send to the rest of the team. The memos updated other members on the overall progress of the study, procedural decisions made, and intentions for the next steps. Project members also reviewed primary codes and themes established by the lead researcher. These exchanges provided the lead researcher opportunities to check his own biases and assumptions and helped produce consensus on themes.

Results

Research Objective A: Exploring Program Barriers and Perceptions of Control

The first objective of this study was to explore the environmental conditions or factors that market managers believed affected their ability to implement, administer, and promote the FAB program effectively. Managers expressed the following themes as logistical barriers that influenced the level of control they felt to administer the FAB program effectively: *bureaucratic limitations, locally eligible producers and growers, organizational structure and funding support, and transportation and physical access.*

Bureaucratic limitations

Managers discussed how rules, regulations, and ordinances could be obstacles to effectively administering and marketing the FAB program. Some managers suggested these obstacles may exert constraining influences on managers' sense of perceived control. One manager shared past issues with providing food-cooking demonstrations by discussing her contractual obligation to facilitate nutritional education and perform nutrition-based marketing for SNAP-eligible clientele. The manager referred to her engagement with local Extension agents who are usually collaborating partners with managers in efforts to offer nutrition-based cooking demonstrations. She was concerned she was not allowed greater latitude to use locally grown fresh fruits and vegetables provided by one of her vendors in the cooking demonstration. She stated, "we just find that with government agencies

that they're . . . at least around here, they're very timid to go beyond anything that they see as their specific rules and regulations." Another manager discussed constraining by-laws adhered to by the market she managed. As members of a growers' association, all vendors at this market deliberate and vote on any proposed change to the market's operational procedures. The association maintains a constitution and bylaws that guide many decisions. The manager addressed the constitution, saying:

It doesn't lend itself to like the modern democratic process. You know? Yes, you can have a constitution or whatever, you can have bylaws, but you have to be able to say, look, you know, we need to step into the modern era.

Locally eligible growers and producers

In its contract with FAB partnered managers, FOG required that only locally produced fresh fruits and vegetables could be redeemed by SNAP shoppers. This mandate stipulated that a consistent supply of fresh fruits and vegetables be available at the partnered market. From the managers' perspective, this presented a challenge. A few managers noted they already felt the impact of fewer and fewer farmers operating locally or regionally. One manager suggested that the local grower rules place a burden on finding and retaining vendors: "...it's mostly a question of eligibility. We don't have too many actual growers at the market."

Another manager shared the perception that local farmers and growers struggled to remain solvent, adding that there was a statewide lack of eligible growers to begin with, saying, "yeah, that has been a challenge. It's been a really tough couple of years for the guys. And eventually, we will not have a farmer base to work with. So that's another concern." The lack of eligible local growers was felt acutely by participants; our research occurred in the aftermath of a major hurricane that severely affected production for growers of various scales throughout the state. A manager said,

This year, because of Hurricane Irma, we had very few local farmers involved. . . . Irma just messed up everybody's seeding season out here, and planting was very late. Some didn't

get back in at all. And it was kind of a mess. But anyway, I see that as a future problem continuing, trying to get through that.

Managers expressed concern that the lack of eligible growers had a detrimental effect on consumer demand and product preference. A few managers believed that if a customer attended a market once and did not find the specific food item or a level of variety that satisfied them, they might not return. As one manager stated, “the casual market shoppers who would come and get their produce and their raw milk, they stopped coming to market because we didn’t have those two major cornerstone farmers in our lineup any longer.”

There was also concern that grower-vendors may compete with one another when local seasonality restricted what could be grown. One manager indicated that roughly a quarter of the market’s vendors were actual eligible growers. Other managers worried that a limited producer base would create an adversely competitive environment for growers. As one of these respondents stated,

I mean, it’s hard to have everyone successful in that situation a lot of the times when especially in the times of the year where everyone’s growing the things because those are what grows well here. It’s hard to have everyone making enough money to keep coming back.

Another participant struggled to reconcile two overlapping concerns: One, that the market required more growers to improve shopper choice, and two, that the market might not be able to facilitate success for a more competitive market environment, noting,

And we’re striving to bring in more food vendors. That seems to be somewhat of a challenge for us because we’re not a big enough market to justify too much duplication. ’Cause I mean, if everybody’s not doing good, then they’re not going to stay.

Organizational structure and funding support

How a market was organized affected managers’ sense of control in sustaining the FAB program

and engaging SNAP shoppers. The FAB adopting managers interviewed for this study represented nine distinct funding and organizational structures for markets. Funding support structures included 501(c)(3) nonprofits, private, community redevelopment agency (CRA)–supported, Cooperative Extension or university supported, Chamber of Commerce supported, merchant association or Chamber of Commerce supported, development authority supported, and growers’ association supported. Managers offered general feedback about whether their market’s structure reduced or intensified barriers to managing and promoting FAB. Managers discussed the level of support they perceived to be receiving from the market’s board, from city administrators, or from whichever organizational body funded their market. This perceived support appeared to influence the level of control managers felt they had in a given situation. As one participant noted, “I think it’s very helpful for me, as a market manager, to have the board behind me.” Another manager described her market as a nonprofit organization with additional resource support from the community’s local downtown development association and city government. She noted the market had been “working on becoming more and more independent of those organizations,” but expressed gratitude that the support provided the market with some autonomy:

The reason it functions as well as it does is that everybody pretty much manages their own project, as long as you inform or discuss. You can manage your own project the best way that you think it should be. And our organization is like that. It’s extremely flexible. I’ve worked in nonprofits for a long time, and it’s the most flexible organization I’ve ever been in, and that’s so beneficial. . . .

Another manager described a dual support structure for the market, mixing funds between local government coffers and the local CRA, noting, “sometimes we’ll need a little extra help. And that’s where the CRA will kick in and help as well.”

A major concern regarding market structure had to do with the staffing and the time commitments

required for FAB-related data entry and marketing. As one manager observed, “the biggest challenge is the fact that none of the funding has provided us a person to operate our SNAP booth, so we had to go look for private funding for that, which we found.” Several managers linked the organizational structure of their market to the amount of leverage they believed they had to hire, retain, and pay trained personnel. Some managers either used private funding streams to provide trained staff or elected to utilize under-trained volunteers once initial grant funding for FAB implementation expired. One manager of a privately owned and operated market, expressed a more pointed concern about expenses, noting a city, a charitable organization, or a CRA his market’s funding:

If you’re running a real tiny market, or you’re a nonprofit and you’ve got a volunteer who’s willing to sit there all day and staff a counter, or a kiosk to do all the paperwork and the bookkeeping and allocate tokens, or whatever process they use, somebody’s paying for that. There’s an added cost to have somebody sit there for hours during the day.

Additionally, select participants perceived privately run markets to be at a slight disadvantage in terms of funding allocation because taxpayers partially subsidize public or nonprofit markets, and these markets do not have to bear the full brunt of operation costs. Private markets, according to one participant, feel increased pressure to justify costs for economic solvency:

Our market is unique in that it’s owned . . . by a for-profit corporation . . . we try to operate it on a break-even basis as a result, but we don’t really ask for, or get, any operating subsidies or contributions from government allocations or whatever. It pretty much has to take care of itself.

Other managers shared this trepidation about investing both time and money in administrating the program. Some managers expressed concern about committing to paid or online advertising, unsure if those outlets were the best uses for the lim-

ited funds they had available. Managers who were less comfortable using digital and social media advertising outlets expressed reluctance to designate limited funds toward these platforms and wary that the market’s board of directors might not approve of increased spending on FAB promotion. As one manager stated, “my concern is the future funding of the program, and we’re dried up right now . . . and God forbid we don’t get the funding, we just drop it. And then you have a lot of unhappy constituents.”

Transportation and physical access

Several managers described the lack of adequate transportation for SNAP shoppers. Managers understood SNAP eligible populations often do not own personal vehicles and are largely dependent on inconsistent public transportation routes to get to the market. A few managers additionally identified seniors within the broader SNAP-eligible population as the least accessible and most in need of transportation outreach:

At one point, we had an agreement with the senior center to bus over there . . . to provide transportation for the seniors. We have a new relationship, or we’re maintaining our relationship with AARP that they bring a group of seniors to the market.

Several managers recognized that certain markets, particularly in rural areas, are “off the beaten path” and are not typically noticeable or accessible. Managers also described broader issues with transportation, such as infrequent bus routes, poor bus scheduling, and the high number of transfers required for community residents to access markets. Because of her market’s location on a semirural farm site, one participant believed the site was not sufficiently noticeable or physically accessible:

When I’m talking to people, outside of the farm, but especially for lower-income families, I imagine some of them don’t have cars, some of them rely on the bus. I know on the weekends, bus schedules are a little funky—I know I can’t think of a bus stop, off the top of my head, anywhere near here . . . that is a big bar-

rier to getting here, and in general, I hear a lot that people just have no idea that we're here . . . that's a huge obstacle.

One manager noted that the initial advertising budget they use to market FAB to shoppers "doesn't really do anything if you're not within walking distance from that community."

Research Objective B: Exploring Manager Strategies and Perceptions of Self-Efficacy

Research objective B explores market manager strategies for administering, marketing, and growing the FAB program at their respective markets. Within this category, we identified the following emergent themes to reflect manager efficacy beliefs: risk-taking and experimentation, loyalty, trust and relationship building with vendors, cultivating market experiences, and strategic coordination with partner organizations. These themes exemplified strategies, tactics, and beliefs that market managers applied to adapt to or resolve some of the barriers they faced while administering the FAB program at their markets.

Risk-taking and experimentation

We asked market managers about any strategic changes they had implemented at their market and the impact they believed those changes had. A few respondents revealed they had taken some experimental risks to increase engagement with SNAP shoppers. One manager admitted she tried to change up her strategy by borrowing certain approaches from other markets: "I also traveled around and went to all different markets all over the state and was a nosy bird. I wanted to see what other markets they were about and how ran, to copy and steal ideas, it's okay." One manager admitted she had made decisions in situations where outcomes were uncertain:

I don't know that I want to say I've been super calculated on how I've strategized this because some of it was, like I said, copying and stealing some good ideas. One of them was what we call our market bucks, our internal currency. It was from a market up north. I was like, what a great idea; let's take that one. Well, that one

has worked tremendously.

Managers expressed that having the freedom to try new things and exercise autonomy built confidence in managing the program and reaching out to SNAP shoppers. As one manager noted, "I'm a firm believer in personally taking baby steps, and I'm not afraid to try something. If it doesn't work, throw it out and back to the drawing board."

Loyalty, trust, and relationship-building with vendors

Some managers felt that the relationships they had with vendors were a key determinant of the success of both FAB and the market broadly. One respondent expressed this view directly: "I love working with the volunteers, with the vendors and the customers. These people are more my friends more than anything else, and that's what keeps me going back on a Saturday morning."

Another manager echoed the sentiment: "I love the vendors; I love what I get to do." Another participant expressed that FAB's success hinged on the relationships and trust she cultivated with her vendors:

I'm on a one-on-one basis with each of my vendors . . . It's like one big family. I know them personally, they know me personally . . . If anybody has a problem, they can come to me, and I can resolve it for them right there and, then we have no issues.

Several managers shared their underlying belief that relationship-building, loyalty, and direct engagement between themselves and vendors built a sense of shared commitment. Managers described their working relationship with vendors, the utility of consistent meetings, and how the promotion of product transparency and standards-compliance built trust. Under FOG, one of the major stipulations of the FAB program was that eligible fruits and vegetables had to be locally grown. Managers demanded transparency from those vendors that wished to provide FAB eligible items to shoppers to ensure that they were legitimately local growers. Transparency also refers to production standards, such as certified organic. Vendors who can verify their standards improve trust with both shoppers

and managers. Discussing her vendors, one participant expressed gratitude for their broad engagement with SNAP, FAB, and the market overall:

They're really supportive. We actually just started a sort of a market committee with some of the vendors who are really supportive and really want to be involved and get more people in the door because it helps them and it helps us. So yeah, our engagement with the vendors is an important part of the market.

Another manager emphasized the importance of loyalty and trust between vendors, administrative staff, and managers, stating that once they completed a full application and signed a contract agreement, vendors were assured they were “getting us as a champion for your product.” A trust and relationship building emphasis was echoed by another manager, reflecting the perceived value of those types of exercises:

As far as vendors go, I instituted a vendor luncheon four years ago. And at the end of the season, we all get together for a free lunch. I buy them lunch, and we have a gift exchange. And you give a gift to get a gift, and just a camaraderie kind of thing where everybody is excited and having a good time.

Cultivating market experiences

Some managers viewed certain grocery retail chains as a threat to the sustained growth and success of markets. They believed these “natural” retailers particularly emphasized fresh fruits and vegetable sales and provided shoppers with in-store events and activities. In response to this concern, several managers reflected on how they could offer more events and craft an *experience* for their customers. Managers perceived experience offerings at the market as a strategy to counteract retailer competition for SNAP redemption and food shopping in general. Experiential engagement with shoppers was perceived to provide a positive economic stimulus effect at the market, prompting “collateral sales.” According to one manager, “in response to the lower shopper numbers, we’ve kicked around ideas, like making the market more friendly for an

experience, as opposed to just going and getting your groceries.”

Several managers employed strategies to provide an exciting atmosphere to attract both SNAP and non-SNAP community members to shop and spend time at their respective markets. Strategies included hosting live musical acts, educational workshops, and fresh fruits and vegetables cooking demonstrations. These actions provided managers opportunities to exhibit a measure of agency to affect market performance outcomes such as shopper attendance rates and the volume of SNAP/EBT and FAB token redemptions. In addition to promoting live music and youth-oriented educational activities, one participant more broadly spoke about the cultivation of a market “vibe”—a welcoming atmosphere that might encourage shoppers across all income brackets to spend more time at the site:

We’re trying to adapt, to get shoppers back as well as get them to grab a glass of kombucha and sit for a while. And you know, enjoy their community. For that, we’ve kind of changed how we market the market, but, you know, we make it more like an experience. As opposed to . . . go in and grab your stuff and go.

Other managers shared experience building strategies they have incorporated at their markets with varying degrees of success. Managers cited farm tours, yoga, cooking demonstrations, and kombucha brewing workshops as previously used tactics. These events represented opportunities for managers to exhibit some measure of decision-making autonomy to influence an outcome (increased attendance, increased SNAP redemption through FAB sales) with minimal external constraints. These efforts seemed to reflect a consistent managerial trend toward adaptation and experimentalism. As one manager states, “we’re always trying to think of just more fun things where you can come and spend the entire Sunday there and never get bored.”

Strategic coordination with partner organizations

Several managers highly valued networking and coordination opportunities with local organizations.

One manager discussed two government offices that were very useful to her market, stating, “the Office of Resource Stewardship and the Office of Sustainability kind of naturally act as that connector a lot of the time for some of the projects that we are doing.” The manager also discussed building up a greater connection with the local SNAP authorizing office. She mentioned the agency’s key role in facilitating access to SNAP-eligible shoppers, saying it “increased accessibility to have those types of relationships.” Another participant discussed the unique organizational structure of their market, illustrating the opportunity for unique relationships between institutions:

Well, our farmers market is a little bit different in that it’s a partnership; it’s a UF/IFAS program. It’s one of my programs under local food systems. We are in partnership with the county as well, with parks and rec. So the market is a joint project between us

Finally, one manager discussed efforts to engage both faith-based organizations and health service providers to build community capacity:

We’re very tied in with [County] Health here, which is our big hospital system down here. They’re very supportive of us. Of course, we try to market through them as well, wherever we can, and get the word out. We’re a real community-oriented market in offering spaces to local community groups and nonprofits and things like that as well. We’re very into that.

Jointly, these strategies represent a broad-based approach to exercise agency to direct actions to improve their confidence in improving their market’s relationship with limited-resource communities.

Discussion

Research Objective A: Program Barriers and Perceptions of Control

Several managers in our sample perceived a decreased demand for local foods that they feared would adversely affect their market. This finding

does not align with data collected from 1994 to 2016, that shows the number of farmers markets listed in the USDA National Farmers Market Directory increased by approximately 400 percent to over 8,600 markets, and with the total value of local food purchased from direct-to-consumer markets doubling between 1992 and 2012 (USDA Agricultural Marketing Service [USDA AMS], 2016). A 2015 report based on 2012 agriculture census data additionally found direct-to-consumer markets generated USD\$3 billion in sales revenue, with on-farm stores and farmers markets accounting for US\$2 billion, or 67 percent (USDA National Agricultural Statistics Service [USDA NASS], 2015). Additionally, regional, state, and county-level consumer behavior may not reproduce national trends. Despite this context, managers perceived that consumer interest in farmers markets was waning. This perception seemed to affect certain managers’ sense of control and agency for long-term administration of the FAB program.

Market structure influenced managers’ perceptions of their ability to administer the FAB program and actively engage limited-resource shoppers. Managers viewed the level of organizational support they received to be a relevant factor in the control they felt they had in administering FAB effectively. This view is supported by Mino, Chung, and Montri’s (2018) assertion that high levels of organizational capacity and support are critical to navigating nutrition incentive programs successfully. Managers linked the organizational structure of their market to the amount of leverage they believed they had to recruit and keep trained staff. Additionally, external funding is necessary to support trained staff or untrained volunteers once initial program funding expired.

Participant feedback partially aligns with findings that various market conditions affect SNAP-eligible individuals’ shopping behaviors and their fresh fruits and vegetable intake (Freedman et al., 2016). Roubal et al. (2016) discussed funding as a barrier in that context, and they found that certain markets received external funding for their EBT programs from agencies not directly associated with the market itself. This finding speaks to how markets leverage funds from different sources but does not say much about market structure and how

that structure affects attitudes, beliefs, and intentions towards nutrition incentive implementation.

The lack of transportation for low-mobility SNAP shoppers was a salient concern for managers. Managers recognized that SNAP-eligible populations were less likely to own personal vehicles and often depended on inconsistent public transportation to get to the market. Transportation constrains the ability for managers to effectively target and reach out to limited-resource shoppers, making it more difficult for SNAP shoppers to locate and physically access the market to redeem their benefits through FAB and increase consumption of fresh fruits and vegetables. These findings align with Wood and Horner's (2016) case study analysis of nutritionally at-risk, limited-resource populations' accessibility to SNAP-accepting locations, with the researchers ultimately suggesting that communities that have limited-resources, low-vehicle access and who are predominately African-American are significantly less likely to easily access retail food outlets. Similarly, Rigby et al. (2012) used census tract data to examine whether neighborhood characteristics related to race, income, and rurality affected SNAP distribution accessibility. The researchers suggested that these neighborhood characteristics strongly predicted SNAP-eligible food-access disparities and that the findings provided an empirical identification of the existence of food deserts and access disparity (Rigby et al., 2012).

While studies have supported the assertion that financial incentives can assist limited-resource individuals in improving fresh fruit and vegetable intake (Bowling, Moretti, Ringelheim, Tran, & Davison, 2016) and in improving fresh fruit and vegetable sales for farmers and markets (Oberholtzer, Dimitri, & Schumacher, 2016), the prevalence of transportation barriers for limited-resource populations can neutralize their broader impact (Freedman et al., 2016). These and other studies validate transportation as a core constraint expressed by the manager participants. Most of these studies, however, acknowledge that transportation-barrier impacts in the farmers market context at-large or in relation to SNAP redemption or fresh fruit and vegetable intake. We recommend that future research continue to examine the same varia-

ble in nutrition incentive contexts.

Research Objective B: Manager Strategies and Perceptions of Self-Efficacy

Managers implemented certain educational measures and initiatives in their respective markets. One manager decided to offer educational field trips at the market site, targeting outreach to youths from prekindergarten up to college, SNAP recipients, and the community at large. Other managers discussed the impact of hosting food cooking demonstrations and building FAB-eligible produce "kits," complete with clear recipe cards that shoppers could reference at home. These efforts reflected self-efficacy by affecting a manager's level of confidence in their ability to implement and sustain the FAB program effectively. The belief that targeted education activities in market spaces can improve nutrition incentive outcomes aligns with Weinstein, Galindo, Fried, Rucker, and Davis' (2014) findings that these efforts, combined with small monetary incentives, increase purchasing behavior and fresh fruit and vegetable intake with limited-resource shoppers. Abello, Palma, Waller, and Anderson (2014) additionally identified that formal and nonformal educational activities hosted at markets were a salient determinant of the frequency of farmers market visits from limited-resource shoppers. This study, however, did not specifically segment limited-resource, SNAP-eligible shoppers from a general consumer base, and so may have limited transferability. While studies demonstrate the utility for educational activities at markets in improving market engagement and fresh fruit and vegetable intake for consumers, we were unable to find examinations of manager perceptions of these initiatives broadly or direct examinations of how these activities affected manager self-efficacy perceptions within a behavioral change context. As such, we believe the results warrant continued research.

Managers indicated that the loyalty and relationships between themselves, vendors, and shoppers were key determinants of the success of both FAB and the market broadly. Our findings demonstrate that relationship-building, loyalty, and direct engagement between managers and vendors build confidence, self-efficacy, and shared commitment.


Managers expressed that a positive working relationship with vendors, consistent meetings, and an emphasis on product transparency and compliance with standards- built trust and improved their confidence that they could manage and promote FAB effectively. Together, these findings address collaborative efforts between managers and the effect those efforts have on managerial perceptions of confidence and self-efficacy in administering FAB to limited-resource shoppers. Further development of this line of inquiry could fill this gap in the literature and have broad implications for the efficacy of nutritional incentive initiatives such as FAB nationwide.

Conclusion

The rapid expansion in the number of farmers markets in the U.S. over the past decade has been viewed by many as progress toward a widely shared goal of improving nutritious food access for low-resource communities, among other things (Godfray et al., 2010; Herman, Harrison, Afifi, & Jenks, 2008; Sadler, 2016). While scholars and practitioners alike have touted markets for their capacity to increase and expand food access, a growing body of literature has identified limits to what the conventional farmers market can achieve and has increasingly recognized that the inclusion of markets in communities may have economically adverse consequences for low-resource communities (Farmer, Babb, Minard & Veldman, 2019; Farmer, Chancellor, Robinson, West & Weddell, 2014; Markowitz, 2010). The recent expansion of nutrition incentive programs at farmers markets may be seen in part as a response to these and related findings.

To further reduce the financial barrier to accessing fresh fruits and vegetables, the USDA has promoted incentive-matching programs at markets to increase fresh fruit and vegetable consumption across the country (Dimitri, Oberholtzer, Zive, & Sandolo, 2015). Our study falls within this context. The purpose of this formative, instrumental case study was to explore how managers of Florida farmers market operated and administered a localized nutrition incentive program while also per-

forming their core managerial duties. We specifically considered in this study how our sample of managers perceived their level of control and agency to effectively administer and market the program to limited-resource and SNAP-eligible shoppers in the face of programmatic barriers and constraints. We addressed two core research objectives to understand managers' experience with FAB administration, maintenance, and promotion: (a) to explore manager perceptions of control through the identification of program barriers, and (b) to explore manager perceptions of efficacy and confidence to administer the program through strategic interventions.

We presented results here to communicate the relevance of manager perspectives and experiences in nutritional promotion efforts and to lay the groundwork for future engagement with this population. The feedback compiled here produced compelling themes worthy of continued examination. While managers held generally positive views of the program, they addressed salient environmental (e.g., transportation access at the market site) and interpersonal (e.g., relationships with vendors) factors that they perceived as barriers to sustained growth and use of the FAB program. We believe these control and agency perceptions from managers are crucial to understand in the broader effort to achieve long-term, sustained growth of related nutrition incentive programs at farmers markets. We, therefore, recommend more expansive examinations of managers' perceptions of nutrition incentive program management through either a personal agency frame specifically or a behavioral theory frame broadly. Results from these efforts may produce compelling implications for improved outcomes for similar nutrition incentive initiatives at farmers markets across the country. 

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Is Canada's supply management system able to accommodate the growth of farm-direct marketing? A policy analysis

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Abstract

In recent years, Canada has witnessed a rapid growth in short food supply chains. As in other countries, such marketing channels have emerged in Canada in response to a growing demand among consumers for fresh, local products. However, a unique feature of Canadian agriculture is that dairy, egg, and poultry production are under supply management. The government requirement for

producers in these sectors to purchase a quota ensures that output matches domestic demand. Until recently, though, little attention had been paid to how this system affects the development of short food supply chains in the country. The purpose of our study is to examine this emerging issue. The results of our policy analysis suggest that small farmers in Canada face multiple challenges when seeking to produce and market specialty products that are under supply management. Furthermore, the cost of entering supply-managed sectors for producers varies as each province is responsible for

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Authors' Note: Implication from COVID-19

Our research was conducted before the COVID-19 outbreak. Since then, interest in short supply chains and local food has dramatically increased. Certain stakeholders discussed in this article are again asking that the supply management system be changed to allow local farms to produce eggs and chickens for their clients.

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establishing its own quota exemption limits, minimum quotas, and new entrant programs. Our study indicates that supply management policies have important implications for local and regional food system development and for food diversity in Canada.

Keywords

Farm-Direct Marketing, Food Systems, Local Food, Short Supply Chains, Supply Management

Introduction

As in other countries, Canada has witnessed in recent years a rapid growth in the practice of farmers directly marketing their products to customers through short food supply chains. According to the most recent agricultural census (Statistics Canada, 2017a), more than 24,500 farms in Canada use such marketing channels, a figure that represents 12.7% of all Canadian farms. Most direct-market farmers sell their products at the farm gate (89%), while some also participate in farmers' markets (22%) or distribute food boxes as part of community supported agriculture programs (CSA) (5%).

Studies indicate that Canadian consumers attribute a wide range of benefits to short supply chains (Mundler & Laughrea, 2016; Newman et al., 2017; Smithers, Lamarche, & Joseph, 2008), despite remaining barriers that limit their accessibility (McIntyre & Rondeau, 2011). Farmer's markets in Canada are notably gaining in popularity and are the most commonly studied direct-marketing channel (Connell, Smithers, & Joseph, 2008; Smithers & Joseph, 2010; Smithers et al., 2008; Wittman, Beckie, & Hergesheimer, 2012). Moreover, research findings suggest that short supply chains contribute to the renewal of Canadian agriculture as many new farmers rely on such local outlets to sell their products (Laforge, Fenton, Lavalée-Picard, & McLachlan, 2018). Fundamentally, farm-direct marketing is part of a larger movement that seeks to promote the relocalization of food production (Mount et al., 2013). Indeed, various studies have explored the relationship between short supply chains and the social economy (Beckie, Kennedy, & Wittman, 2012;

Campbell & MacRae, 2013).

In Canada, poultry (chickens and turkeys), egg (table and hatching eggs), and dairy (cow's milk) production are under supply management. In each of these commodity sectors, quota policies ensure that supply matches domestic demand by controlling output, setting prices according to production costs, and limiting imports (Goldfarb, 2009; Painter, 2007; Schmitz & Schmitz, 1994). As a result, Canadian farmers interested in producing supply-managed commodities are required to purchase a quota once their production volume exceeds a certain threshold. While the effect that this system has on the growth of short supply chains is considered an important research priority (Blay-Palmer et al., 2013), the topic has received relatively little attention until recently.¹

Supply management in Canada has proven effective at stabilizing production and protecting farmer revenues. At the same time, it has been criticized by some for its inability to supply consumers with niche products (Amir, 2014; Legendre, 2015). Indeed, several press articles in recent years have reported on growing calls among Canadian consumers for more specialty poultry, eggs, and dairy products (marketed as organic, free-range, grass-fed, antibiotic-free, heritage breed, etc.) (Ballivy, 2012; Csanady, 2015; Lamontagne, 2015; Ménard, 2015). However, according to sustainable farming advocacy groups, the rules of supply management prevent the farm sector from responding to this rising demand.

These critics point out that many farmers are interested in producing small quantities of specialty products for local markets but are unable to do so because they do not own a quota. Indeed, small farmers often struggle to enter supply-managed sectors because quotas are rarely available, expensive, or require a minimum level of output that is too high (Amir, 2014; Lamontagne, 2015; Legendre, 2015; Young & Watkins, 2010).

The purpose of our study is to examine these various issues affecting Canada's food system. In the first section, we provide a brief overview of supply management in Canada. We also examine the ongoing debate around quota policies and high-

¹ With the notable exception of Young and Watkins (2010) and Mount (2017).

light how the nature of the disagreements has shifted in recent years due to rising consumer interest for specialty food items and the growth of short supply chains. In the second section, we outline the research activities we undertook to gather information on supply management policies and programs. The results of our research are then presented in the third section. Specifically, we examine quota exemption policies and minimum quota holding requirements and analyze the programs that have been created to assist small farmers seeking to directly market specialty products. In the fourth section, we discuss the implications of our findings and the major lessons that can be drawn from recent reform experiences in Canada. Finally, we conclude by examining the future of supply management in Canada in light of the growing demand among consumers for specialty products and the rising popularity of short supply chains.

The research contribution of our study is twofold. Firstly, since each province sets its own quota policies, our study highlights the unequal playing field that faces farmers who are interested in directly marketing supply-managed goods. Secondly, we provide an in-depth analysis of the new societal challenges that currently confront Canada's supply management system. This system was historically implemented during a period of agricultural modernization and market instability. We note that the mounting calls for regulatory reform are not intended to challenge the basic legitimacy of the quota system. At the same time, the criticisms made do reflect a growing demand on the part of consumers for greater food diversity, understood here to mean a wider variety of available food items (Harvey, McMeekin, & Warde, 2004; Thiele & Weiss, 2003).

Supply Management in Canada

The Organization of Supply-Managed Sectors

In Canada, the federal and provincial governments have historically enacted different programs to support farmers (Schmitz, 2008). At the end of the 1960s, the idea of controlling agricultural supply through quotas emerged as a promising policy alternative to revenue support programs, which had been introduced in the post-war period. Policy-

makers argued that a quota system was preferable because it would effectively safeguard farmer revenues, promote market stability, and ensure that prices adequately compensated producers without the need for further subsidies (Gouin & Kroll, 2018; Hiscocks, 1972).

In concrete terms, supply management policies control output in a given sector and set prices so that farm production costs are covered. The fiscal burden of implementing such a program is minimal since most of the costs are borne by stakeholders within the supply chain itself (producers, processors, distributors, and consumers). In addition to protecting farm revenues, supply management also plays an effective role in stabilizing consumer prices.

Dairy farmers were the first to be included in a national quota system (1970), followed by egg (1972), turkey (1974), and chicken producers (1978). Subsequently, prices for these commodities were no longer determined by supply and demand but set using a formula that accounts for production costs. As a result, the system enables producers who hold quotas to obtain prices that are negotiated, known in advance, and guaranteed.

In exchange for this arrangement, producers in Canada are required to collectively adjust their total output in response to changes in domestic demand. When demand rises (falls) for a supply-managed commodity, the national quota is adjusted upwards (downwards), and changes are then made to each provincial allotment. Finally, the amount allocated to individual quota holders is adjusted based on their share of the provincial allotment from the preceding period (Katz, Bruneau, & Schmitz, 2008). Usually the national quota is adjusted annually and the changes are passed down to the provinces, who then proportionally adjust the amounts held by each individual quota holder. In exceptional cases, these adjustments are made over the course of the year. As a result of these policies, agricultural commodities in Canada that are regulated through quotas are rarely exported. At the same time, access to the Canadian market is limited since import tariffs are imposed on all supply-managed goods. However, to ensure that the poultry, egg, and dairy sectors remain at least partially exposed to market forces, producers are authorized to buy

and sell quotas (except in certain cases, such as when the allotment is a loan) (Gouin, 2001; Walker, 1968).

To implement the quota system, the producer association at the provincial level for each supply-managed sector was given a legal mandate to distribute and manage the province's allotment. Each of these associations is also responsible for determining the maximum authorized level of output that farmers without quotas can produce, as well as the minimum production volume that is required of those who wish to obtain an allotment.² In addition, every province has an independent regulatory agency whose role is to review the regulations proposed by producer associations, verify that the rules are being correctly enforced, and settle disagreements among stakeholders.

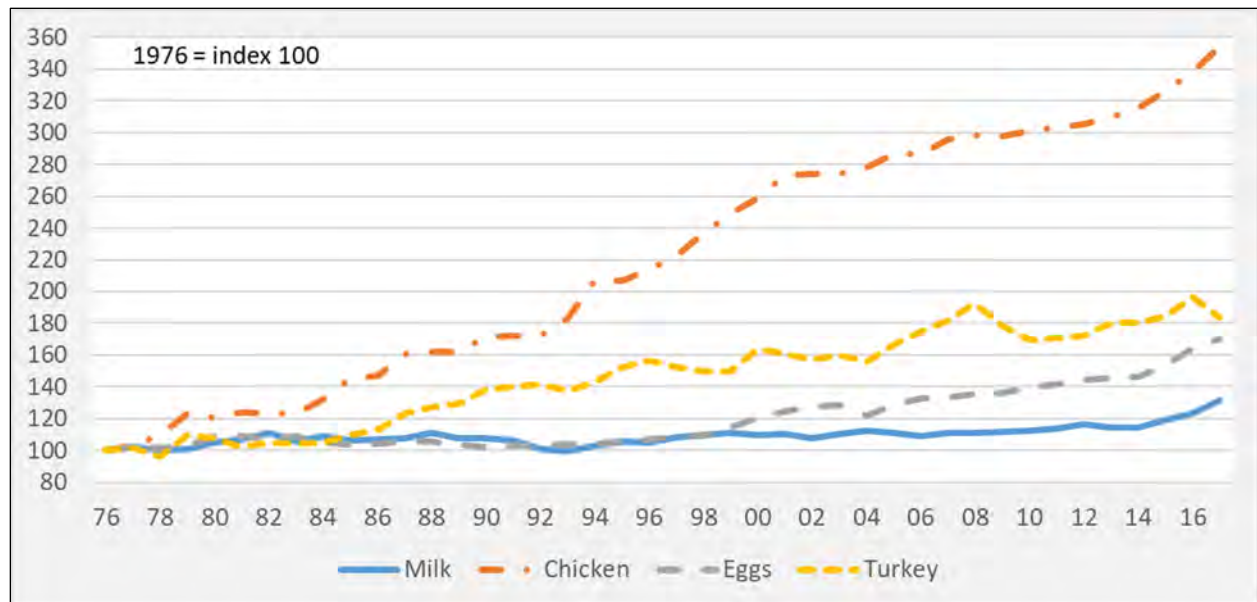
At its core, supply management was instituted as a way to address the problems experienced by dairy, poultry, and egg producers, who regularly faced periods of overproduction and declining prices (Doyon, 2011). As Figure 1 illustrates, supply-managed production has had to adjust to changes in demand. For instance, public concerns

about cholesterol at the end of the 1980s caused dairy consumption to fall. As a result, downward adjustments were made to dairy quotas, and production contracted by 11% between 1988/89 and 1992/93. Nevertheless, since 2014, growing demand among Canadian consumers for dairy products has led to a rise in milk production.

In addition, a rise in demand for chicken from the mid-1980s onwards has led to a significant increase in output. Since the beginning of the 2000s, egg production has also expanded rapidly. In response to these favorable market trends, the associations of chicken, turkey, and egg producers in each province have distributed new allotments to individual quota holders. These allotments are generally given (not sold) to producers and immediately acquire a market value (since they can be traded). However, in some cases (e.g., Quebec's egg producer association), they are lent out and remain the property of the association.

To summarize, supply management policies in Canada were enacted in order to (1) set prices according to production costs, (2) establish a quota system that could meet the needs of the domestic

Figure 1. Evolution of Production in Sectors Under Supply Management, Canada, 1976–2017



Note: The data for chicken production covers both chickens and laying hens. Egg production includes table and hatching eggs.
Sources: Statistics Canada (2017b, 2017c, 2017d); our calculations.

² The producer associations enforce their regulations through marketing boards (Royer, Ménard, & Gouin, 2015).

market, and (3) control imports. These policies were the result of a social compromise established in Canada in the 1970s. In practical terms, the quota system reflects a willingness on the part of Canadian consumers to accept prices that adequately compensate producers by limiting their exposure to foreign competition and the volatility of world markets. In exchange, supply-managed farmers agree to meet the needs of the internal market and satisfy the quality expectations of Canadian consumers.

A Contested System

While supply management is today a unique feature of Canadian agricultural policy, it is not without its critics. Some argue that the use of quotas leads to market distortions, protects inefficient producers (Veeman, 1982), hinders restructuring efforts, reduces sectoral competitiveness, and prevents producers with lower production costs from expanding their output (Hall Findlay, 2012). Moreover, certain studies suggest that supply management in Canada places a heavy burden on consumers, especially low-income households, due to the inelastic nature of demand for supply-managed products (Cardwell, Lawley, & Xiang, 2015; Desrochers, Geloso, & Moreau, 2018). Quota policies are also criticized by some for hindering the ability of producers and food processors to export their products (Barichello, Cranfield, & Meilke, 2009; Carter & Mérel, 2016). Finally, it is argued that Canada's defense of supply management weakens its negotiating position during international trade talks and closes off export opportunities for other products, including food items that are not regulated by quotas (Hall Findlay, 2012).

The cost of purchasing a quota also uses up capital that could have been productively invested elsewhere on the farm. Some researchers suggest that this discourages new farmers from entering supply-managed sectors and lowers farm productivity. (Moreau, 2017; Richards, 1996). Furthermore, given the significant decline in the number of dairy producers in Canada, critics contend that the system fails to protect small farms and that quotas are increasingly concentrated in the hands of a few producers (Hall Findlay, 2012).

At the same time, other studies indicate that

supply management offers more advantages than drawbacks, including for Canadian consumers. Indeed, various authors argue that criticisms of quota policies overlook the fact that agricultural markets are inherently unstable, given that food prices are more volatile than output (Boussard, Gerard, Piketty, Ayouz, & Voituriez, 2006; Gouel, 2010; Graddy-Lovelace & Diamond, 2017). Also ignored is the fact that food supply chains are often dominated by stakeholders capable of imposing their own terms and conditions on producers. (Royer, 2008). Consequently, if the price for a primary agricultural product falls, the reduction is not automatically passed along to the consumer. Instead, the difference is often captured, to a greater or lesser extent, by processors and distributors, depending on their level of market power (Boston Consulting Group, 2015). Furthermore, research findings indicate that consumer prices for supply-managed products are sometimes cheaper in Canada compared to other countries, depending on the product category and the value of the Canadian dollar, among other factors (Doyon, Bergeron, & Tamini, 2018). As well, it is argued that import restrictions on eggs, dairy, and poultry products do not weaken Canada's position during international trade talks since the country has many other market opportunities that can be presented to prospective trading partners (Mussell, 2012).

Other studies have also found that supply management does not hinder sectoral development but rather, creates a stable environment for investment (Tamini, Doyon, & Zan, 2018). In addition, it is worth noting that Canadian farms in supply-managed sectors are, on average, considerably smaller than those in New Zealand and the United States, where quotas are not used. For instance, the average number of cows per dairy farm in Canada is 85, which is considerably lower than in the United States, where the average exceeds 230 (Mundler & Ruiz, 2018). This suggests that supply management has been successful in protecting the viability of family farms and rural communities (Muirhead, 2017).

Indeed, various studies have emphasized the importance of maintaining the agricultural fabric of rural areas and of protecting the economic, social, and environmental role of farmers (Boody et al.,

2005; Bowler & Ilbery, 1999). In this context, supply management does not so much encourage inefficient small-scale farming as it preserves a dynamic form of agriculture. Thus, the policy is, beneficial for rural communities and leads to the creation of numerous services that supply-managed farmers and their households can rely on, such as garages, salesrooms, grocery shops, financial service centers, and community gathering places. (Muirhead, 2017). In this way, supply management helps shape the rural landscape by maintaining a strong agricultural presence in regions where soils are not fertile enough to grow crops intensively (Ruiz & Parcerisas-Benede, 2017).

The Growth of Short Food Supply Chains and the Changing Nature of the Debate

The debate over supply management has generally centered around the question of whether it is economically efficient. However, new questions are being raised in Canada about the role that the quota system plays in rural development. Promoters of farm-direct marketing argue that the system prevents specialty farmers from selling small quantities of supply-managed products to consumers in local niche markets. At the same time, the goal of these critics is not to dismantle supply management, but rather to push for reforms that address the growing desire among Canadian consumers for specialty products and direct marketing relationships (Laforge et al., 2018; Mount, 2017).

We note that Canada is the only country that still maintains supply management policies. Consequently, it is difficult for comparisons to be made with other countries. In addition, the potential impact of quotas on the growth of farm-direct marketing and specialty products was not a topic of discussion in those countries that did adopt supply management. Furthermore, Canada was the only country to supply manage chicken and egg production. Moreover, the current debate in Canada over whether to loosen regulatory restrictions mostly focuses on these two commodities, which explains why little research has been conducted on the topic

outside the country.

In contrast to many European countries, the practice of farm-direct marketing in Canada is a more recent phenomenon and was not part of the agricultural landscape when supply management policies were introduced. In the dairy sector, for instance, rising consumer demand for specialty cheeses has led to the growth of artisanal cheese-making on farms, especially in Quebec. However, regulations in most provinces set the minimum quota at 10 kg of butterfat (BF)³ (equivalent to roughly 80,000 annual liters of milk), making it difficult for producers to start small dairy farms. Policymakers established these minimum quota requirements as a way to boost productivity in the dairy sector and ensure a cost-effective collection of milk across each province. Nevertheless, the rules enacted fail to account for the recent development of small-scale artisanal cheese production. While only a small fraction (0.4%) of dairy (cow's milk) farms process and directly market their own products, many small-scale producers make their own cheeses from sheep or goat's milk. Since these dairy categories are not regulated by quotas, they represent a more feasible production option for small farmers and new entrants (Mundler et al., 2017).

Ultimately, the growth of farm-direct marketing alongside Canada's supply management system raises new challenges for policymakers. Regulatory officials are increasingly under pressure to accommodate the rising demand for specialty products in short supply chains (Mount, 2017; Stewart & Dong, 2018; Young & Watkins, 2010). There are also growing calls for policy-makers to facilitate new entrants from different backgrounds who are looking to supply these emerging niche markets (Laforge et al., 2018). Consequently, the debate over supply management has shifted away from the question of whether it should be abolished for economic reasons. Instead, advocates for reform maintain that quota regulations should evolve in order to promote equity, foster agricultural renewal, and respond to changing consumer tastes. Such reforms, they argue, will

³ Dairy quotas are measured in terms of kg of BF/day. The level of daily BF content can vary, depending on different factors, but one kg is roughly equivalent to the output of one dairy cow.

enable supply management to become once again an effective tool for rural development (Girouard, 2014; Laforge et al., 2018; Legendre, 2015; Mount, 2017).

Materials and Methods

To better understand how the governance of Canada's quota system affects the ability of small farmers to produce and directly market supply-managed commodities, we gathered information from various stakeholders at the provincial level. The research undertaken focused specifically on three key areas of interest:

- The maximum amounts that farmers can produce without a quota and the reasons behind these limits;
- The minimum output that farmers are required to produce if they wish to purchase a quota; and
- The reforms enacted by certain provinces to support new entrants who wish to directly market small production volumes.

In total, we carried out 19 semistructured interviews by telephone with representatives of industry, producer associations, and government ministries in three Canadian provinces (British Columbia, Ontario, and Quebec). We focused on these provinces because, in recent years, they were required to change their policies to accommodate direct-market farmers. Also, in all three provinces, there are large numbers of farmers who practice direct marketing (in total, these farmers represent 76% of all Canadian producers who sell through short supply chains). As well, we contacted each active provincial producer association in Canada (37 in total) by email or phone to obtain additional information on current quota regulations. The data presented in the following section was accurate as of December 31, 2016.

Results

Quota Exemption Levels

The producer associations in each province determine the maximum level of supply-managed output that farmers can produce without needing to

purchase a quota. Production within these limits is intended for farm household consumption and not for sale, although selling is not prohibited. However, the exact volumes that are sold without a quota cannot be determined since the producers who do so are not required to declare their output. Nevertheless, we show later on with the cases of Ontario and British Columbia that these sales most likely represent less than 1% of chicken and egg products sold in Canada.

With the average decline in the size of Canadian families, certain provinces decided to tighten their exemption rules. For instance, in the egg sector, Quebec reduced the ceiling from 249 to 99 hens (Mundler et al., 2017). Nevertheless, a flock of 99 hens (each one producing almost one egg per day) still largely exceeds the consumption needs of a current family of four or five—just as 249 hens surpassed the needs of larger farm households in the past. Thus, it is not clear whether the decision to impose tighter restrictions was motivated by changing family demographics. In most cases, the provinces seek to give farmers the option to produce small quantities for domestic (household) consumption and local sales. Later on, we discuss quota exemption policies in the context of direct marketing.

Table 1 shows the maximum outputs allowed, as well as the percentage of farms in each province that practice farm-direct marketing. As can be seen from the data, the exemption ceiling for chicken production varies widely, from 99 birds in Newfoundland and Labrador to 2,000 birds in Alberta. There are also large differences in the maximum flock size for turkeys, although less so for laying hens. We note that none of the provinces authorize dairy production without a quota except Alberta, which allows farmers to produce up to 50 liters/day as long as the milk is processed on the farm.

Table 1 also reveals that the least restrictive quota exemptions are found in the provinces where farm-direct marketing is less commonly practiced, namely Alberta, Manitoba, and Saskatchewan. According to the stakeholders we interviewed, this could be due to the strong presence of Hutterite colonies in these three provinces (96% of the 370 colonies in Canada are

Table 1. Quota Exemption Limits and Percentage of Farms that Practice Direct Marketing

	Chicken ^a	Turkey ^a	Egg ^a	Dairy (L/day)	Percentage of farms that report practicing direct marketing
Alberta	2,000	300	300	50	5.1
British Columbia	200 (2,000)	49 (300)	99 (399)	0	32.3
Prince Edward Island	500	n/a	299	0	14.4
Manitoba	999	99	300	0	6.1
New Brunswick	200	25	199	0	22.1
Nova Scotia	200	25	200	0	23.6
Ontario	300 (3,000)	50	99 (500)	0	15.1
Quebec	300	25	99 (500)	0	18.9
Saskatchewan	999	99	300	0	3.8
Newfoundland and Labrador	99	n/a	99	0	34.2

^aThe chicken, turkey, and egg columns indicate the maximum number of chickens, turkeys, and laying hens, respectively, that farmers can raise without a quota. The figures in parentheses either indicate the maximum level of production allowed with a direct marketing permit (which we discuss later on) or represent grandfathered provisions that benefit only a limited number of producers.

Sources: The data in the first four columns were gathered by the authors and updates the previous findings of Young & Watkins (2010) and Girouard (2014); the data in the last column were sourced from Statistics Canada (2017a).

located in Alberta, Manitoba, and Saskatchewan).⁴ It is thus possible that the exemption levels are set high in order to respect the communal arrangements of these colonies. At the same time, in British Columbia, where almost one in three farms pursue direct marketing, special programs have been created that give poultry and egg farmers permits to produce over the exemption limits for local markets. Similar programs have been set up for chicken and egg producers in Ontario and for egg farmers in Quebec (we examine these programs further on).

Quota Procurement Rules

In addition to setting the exemption limits, the provincial producer associations specify the minimum output levels that farmers are required to meet if they wish to own a quota (Table 2). In the case of poultry, it is difficult to compare minimum quotas because Quebec measures production in square meters, whereas the other provinces use kg of live weight. As well, depending on the province, poul-

try output is measured annually or by the production cycle (which lasts eight weeks). We note that Alberta is the only province that does not impose a minimum quota in any of the four sectors under supply management.

Table 2 also indicates that the minimum quota for a supply-managed commodity varies widely from one province to another. Even within a province, one sector might require that producers purchase a minimum quota, whereas another sector might not specify a base amount. Since many producers who directly market their own products run small farms, these regulatory differences affect their ability to enter certain supply-managed sectors. For instance, in Nova Scotia, it is theoretically impossible to produce between 200 chickens (the quota exemption ceiling) and 117,500 chickens (the minimum quota), meaning a farm has to stay small or become very large. It is also difficult to process cheese or yogurt on a small dairy farm since the minimum quota is generally set at 10 kg of BF/day, which roughly corresponds to the milk output

⁴ According to the Canadian Encyclopedia, in 2016, there were 175 colonies in Alberta, 110 in Manitoba, and 70 in Saskatchewan (Ryan, 2013).

Table 2. Minimum Quota Holding Requirements

	Chicken	Turkey ^a	Eggs	Dairy
Alberta	No minimum	No minimum	No minimum	No minimum
British Columbia	No minimum	No minimum	400 hens	4.1 kg of BF/day
Prince Edward Island	No minimum	n/a	No minimum	10 kg of BF/day
Manitoba	30,000 kg/cycle (roughly 97,500 chickens/year)	60,000 kg/year	500 hens	10 kg of BF/day
New Brunswick	No minimum	No minimum	No minimum	10 kg of BF/day
Nova Scotia	235,000 kg/year (roughly 117,500 chickens)	71,400 kg/year	No minimum	10 kg of BF/day
Ontario	182,000 kg/year (roughly 91,000 chickens)	2,000 kg/year	No minimum	10 kg of BF/day
Quebec	10 m ² (roughly 775 chickens)	No minimum; 50 m ² (roughly 3,000 kg/year)	No minimum	10 kg of BF/day
Saskatchewan	38,940 kg/cycle (roughly 143,000 chickens/year)	No minimum	No minimum	No minimum
Newfoundland and Labrador	No minimum	n/a	No minimum	500 liters/day

^a Regarding turkey production: In Quebec, there is no minimum purchase requirement if a quota is bought through the province's centralized trading platform. If a farmer buys a quota directly from another producer, the minimum amount is 50 m². Prince Edward Island does not have an active producer association, although the regulations needed to create one are in place. In addition, Newfoundland and Labrador does not participate in Canada's supply management system for turkeys.

Sources: The data were gathered by the authors and updates the previous findings of Young & Watkins (2010).

from 10 cows.

As well, the financial cost of purchasing a quota presents an additional entry barrier for many producers. Generally speaking, quota prices vary between provinces. In the dairy sector, the producer associations in Nova Scotia, Prince Edward Island, Ontario, and Quebec responded to rising milk quota prices by capping the per-unit value at \$24,000.⁵ In the case of New Brunswick, a price ceiling of \$25,000 was instituted. Dairy quota prices in the remaining provinces are determined through supply and demand. In February 2019, the price of a milk quota in Canada ranged from \$24,000 (the

lowest price ceiling) to \$40,040 in Alberta.⁶ For producers, the cost of purchasing a quota is equal to the minimum output requirement multiplied by the price for a quota unit.⁷

In the egg sector, the price for a single laying hen quota varied between \$245 and \$350 at the end of 2016, depending on the province. As we mentioned, it is difficult to compare poultry quotas across Canada since the provincial producer associations use different units of measurements. However, by converting the different values to annual kg of live weight, we estimate that chicken quotas at the end of 2016 were priced between \$3.56/kg

⁵ All figures are in Canadian dollars.

⁶ <http://lait.org/leconomie-du-lait/statistiques/>

⁷ We remind the reader that dairy quota units are expressed in kg of daily BF. One kg of quota is roughly equal to the output of one dairy cow. If the minimum quota is 10 kg of BF/day (as is the case in most provinces, see Table 2) and the price of a single unit of quota is \$25,000, the minimum entry cost for a producer is \$250,000. To produce a hectoliter of milk, a farmer will spend \$235 in quota, while the price per hectoliter is roughly \$70. A farmer will thus need to produce milk for a little more than three years to pay off the quota, leaving aside other production costs.

and \$10.85/kg.⁸ We also estimate that turkey quotas during the same period were valued between \$3.08/kg and \$7.64/kg.

Each province has programs in place that support new farmers by giving or lending them special quotas. For example, Quebec's association of egg producers allocates lifetime quotas of 6,000 laying hens to one or two new producers each year. In some provinces, priority is given to certain regions or production methods (such as certified organic). However, in many cases, the programs fail to meet the needs of new entrants, many of whom are interested in directly marketing small quantities of supply-managed products (Young & Watkins, 2010). Furthermore, only a small number of new producers each year benefit from these programs. This is because most of the increases in provincial allotments due to rising demand are freely allocated to farmers who already own quotas. This is due to the fact that quota holders are the ones who fix the quota procurement rules within the producer associations that represent them and that manage the system. Consequently, between 2005 and 2015, only 7% and 6.9% of new chicken and hen quotas respectively were allocated in Quebec to beginner farmers (Mundler et al., 2017).

This brief overview of provincial quota regulations highlights the many difficulties faced by small farmers looking to produce supply-managed commodities for niche markets. Moreover, since quota policies are enacted at the provincial level, the cost of entry for producers varies depending on the province, while producer prices are generally the same across Canada (which is considered to be a single market). Entry barriers are especially high for prospective chicken and turkey farmers, owing to the strict minimum quota requirements in several provinces. Setting the exemption limit too low also compromises the ability of small farmers to supply local markets. For instance, in the egg sector, most provinces do not impose a minimum quota, so the starting level is usually determined by the exemption ceiling, which, in several provinces (Quebec, Nova Scotia, and Newfoundland and Labrador), is

limited to 99 hens. Producers in these provinces could theoretically purchase an allotment to grow their production, but, since quota prices are elevated (between \$245 and \$400 for a laying hen), the profitability of such a purchase is limited.

Finally, we note that most provinces set the minimum quota for dairy production at 10 kg of daily BF (equivalent to roughly 10 cows). With the notable exception of Alberta, farmers without quotas are not authorized to produce limited quantities of milk. Nevertheless, Alberta and Saskatchewan do not specify a minimum quota amount, meaning that producers in either province who want to start small dairy farms could theoretically do so by purchasing a small allotment. This avenue is likewise open to producers in British Columbia, since the province's minimum quota is set at only 4.1 kg of BF/day. As we explain in the following section, British Columbia's dairy association also created a program to assist small farmers looking to manufacture and market their own dairy products.

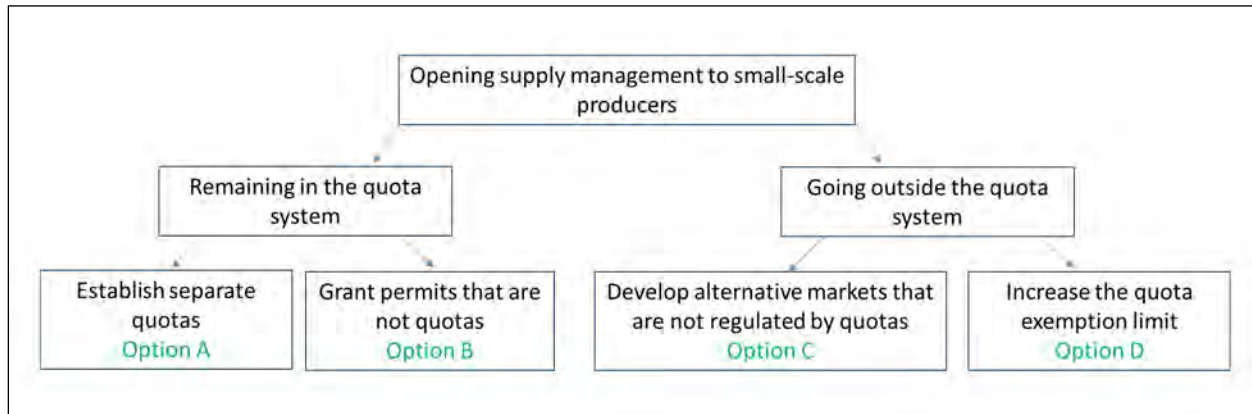
Making Room for Short Supply Chains: The Diverging Reform Paths Between Provinces

In response to changes in consumer demand, British Columbia, Ontario, and Quebec have recently implemented policy reforms to support small farmers who wish to market supply-managed products through short supply chains. Theoretically, Canada's supply management system could evolve in different ways to accommodate small-scale specialty producers (Young & Watkins, 2010). In Figure 2, we organize these various policy options into four categories. Three of these have been enacted; the fourth is possible but has not been tried.

Options A and B accommodate new farmers within the quota system. Under both scenarios, the producer association in question administers the new policy and sets the rules. In contrast, options C and D enable producers to market their products outside the quota system. The easiest solution (option D) is to raise the quota exemption ceiling. Another possible approach would be to change the legislation so that certain markets or products are

⁸ In the case of Quebec, chicken quota trading resumed in April 2019, following a nine-year moratorium, so our calculation is based on prices for that month. With the resumption of trade, the quota price increased to \$1,850 per square meter of production (equivalent, on average, to 77.5 birds annually). In other words, a chicken weighing 2.2 kg was priced at roughly \$10.85/kg.

Figure 2. Supply Management Reform Options



exempt from supply management rules (option C).⁹

Table 3 presents the various programs introduced in British Columbia, Ontario, and Quebec to accommodate small farmers in short supply chains and the corresponding policy option that each program reflects. As can be seen, the producer associations mostly favored options A and B as it enables them to maintain regulatory control over the development of local specialty markets. The only policy exception can be found in Quebec where the quota exemption limit for chickens was increased from 100 to 300 birds in July 2019 (option D) (RMAAQ, 2019).

We note that the regulatory oversight exercised by the associations does not extend to farmers who produce within the quota exemption limits. According to the Ontario Federation of Agriculture, over 16,000 Ontario farmers without quotas purchase chicks annually, although the average chicken flock size is 75, far below the maximum authorized exemption limit of 300. In Quebec, the association of poultry producers in 2014 calculated that 716,000 chicks were purchased by producers who did not hold quotas. Since the province’s exemption ceiling is set at 100 birds, this implies that at least 7,160 farmers were raising chickens without a

Table 3. Outline of the Programs Introduced to Support Small Producers in Short Supply Chains (and the Corresponding Policy Option)

	Chicken	Turkey	Eggs	Dairy
British Columbia	Permit Growers Program (B)	Direct Vendor Program (B)	Small Lot Program (B)	Cottage Industry Program (A)
Ontario	Artisanal Chicken Program (B) Local Niche Markets Program (A)			
Quebec	Increase in the quota exemption level from 100 to 300 chickens (D)		Support program for beginner farmers focused on direct marketing (B)	

⁹ This approach has not been tried for the moment. However, the provision does exist in certain regulations. For instance, in Quebec, Article 63 of the Act Respecting the Marketing of Agricultural, Food and Fish Products stipulates that “a joint plan does not apply to sales made directly by a producer to a consumer. Nevertheless, the Régie [the province’s administrative tribunal for agriculture] may, by regulation, on the conditions it determines, subject such sales to any provision of a plan, by-law, homologated agreement or arbitration award if it is of the opinion that such sales seriously affect their application.” In this sense, the quota exemption ceilings can be justified on the grounds of the second half of Article 63, although this legal interpretation is challenged by different stakeholders (RMAAQ, 2019).

quota (RMAAQ, 2017), a figure that represents almost a quarter of all producers in Quebec. As a result, the province's poultry association has expressed concern that a large number of these farmers will increase their output if the quota exemption rules are relaxed. We later show that such fears are largely misplaced.

As Table 3 indicates, British Columbia pursued options A (for dairy) and B (for poultry and eggs). Reforms began in 2003 after the British Columbia Farm Industry Review Board (the province's agricultural regulatory agency) instructed the associations of chicken and turkey producers to revise their quota exemption policies (BCFIRB, 2005). Subsequently, two new programs were created that now give small farmers special permits to raise up to 2,000 chickens or 300 turkeys for farm-direct marketing purposes. Producers interested in joining either program must first register and are required to follow animal care, food safety, and biosecurity regulations. Nevertheless, participating farmers do not pay fees to the province's turkey or chicken producer associations (which, for quota holders, is set at \$0.019 per kg of live weight). In 2016, 182 chicken permits were distributed to farmers in the province, who raised a total of 73,266 birds (with an average flock size of 403 birds). This output represented 0.08%–0.09% of British Columbia's total chicken production. In the same year, turkey permits were given to 42 farmers, each of whom raised, on average, 162 birds. The total output from this program was equivalent to 0.15% of the province's turkey quota.

In British Columbia's egg sector, a similar program was implemented that gives small-scale producers permits to raise up to 399 hens without needing a quota. At the end of 2015, the program was limited to 50 permits, and registered farmers are required to produce eggs that are certified organic. The province's egg producer association estimated that permit holders raised, on average, 350 hens and produced a total of 445,200 dozen eggs, a figure that represents 0.56% of British Columbia's egg quota.

While most Canadian provinces impose a minimum dairy quota of 10 kg of BF/day, in British

Columbia the minimum is set at 4.1 kg. Furthermore, in 2005, the province's dairy association created the Cottage Industry Program to facilitate the small-scale production of farm-manufactured dairy products. Under the program, participating farmers are given a free quota between 4.1 kg and 27.5 kg of BF/day. The allotment is non-transferable during the first 15 years, and producers are required to process their own milk. In 2014, the program had four participants.

In the case of Ontario, sustainable farming advocacy groups in the early 2010s pushed strongly for chicken quota regulatory reforms. Two organizations in particular (Sustain Ontario and Practical Farmers of Ontario) led public campaigns, lobbied officials, and filed lawsuits against the provincial government and the Chicken Farmers of Ontario (CFO) (the province's association of chicken producers) in an attempt to increase the quota exemption limit from 300 to 2,000 chickens. In 2010, roughly 13,000 producers without quotas were raising chickens with an average flock size of 75 birds.¹⁰ The total output from these producers represented 0.4% of Ontario's chicken quota in 2011.

Despite the efforts of advocacy groups, the exemption ceiling in Ontario for chickens was kept at 300 birds. However, in 2015, after a series of consultations with stakeholders across the province (Bryan Boyles & Associates, 2015), the CFO agreed to create new programs and make changes to existing ones. Subsequently, in 2016, the Artisanal Chicken Program was launched, which gives producers permits to grow between 600 and 3,000 birds annually. By the end of its first year, the program had issued 103 permits to farmers who proceeded to raise, on average, 1,500 chickens. Unlike the program in British Columbia, participating farmers in Ontario pay an annual fee to the chicken producer association (\$0.036 per chick), in addition to paying for the permit (\$0.20 per chick). However, we note that, in both provinces, the total output from permit holders as a percentage of provincial chicken production was roughly similar (between 0.08% and 0.09%, depending on the weight of the chickens).

¹⁰ <https://www.ontariochicken.ca/Programs/FamilyFoodProgram.aspx>

The permit programs for chicken growers in Ontario and British Columbia both reflect policy option B. However, the CFO also pursued option A by setting up the Local Niche Markets Program, which grants special quotas to farmers who are interested in supplying local markets with specialty products. In total, 5% of the annual increase in provincial production is allocated to this program along with the Artisanal Chicken Program.

In Quebec, the association of egg producers chose option B by introducing a five-year pilot program that supports farmers who practice direct marketing. Every year since 2016, the program distributes five new permits, which enable recipients to raise up to 500 laying hens. The permits are non-transferable, and the program targets producers who sell their products through CSA programs, online platforms (*marchés virtuels*), or farmers' markets. In addition, participating producers are forbidden from selling to restaurants or grocery stores and are not allowed to own a quota.

Despite these changes, various advocacy groups in Quebec argue that the reforms do not go far enough. As a result, in 2018, a farmer organization (*Union paysanne*) requested that the province's administrative tribunal for agriculture (RMAAQ) give producers without quotas the right to raise up to 2,000 chickens, 300 turkeys, and 300 hens (an outcome that would correspond to policy option D). The tribunal denied the request to raise the exemption ceilings for turkeys and laying hens. However, it did agree to increase the allowable limit for chickens from 100 to 300 birds (RMAAQ, 2019) and to put in place a five-year pilot project, similar to the one created in 2016 by the association of egg producers. The new program will give 10 producers per year the right to grow and directly sell up to 2,000 chickens. Thus, at the end of the five-year period, 50 farmers will have been issued permits as part of this pilot project.

Discussion

Originally conceived as a mechanism for stabilizing markets for certain agricultural commodities, Canada's supply management system today faces new challenges due to changes in societal views about agriculture and rising demands for greater food diversity. Since the beginning of the 2000s, short

supply chains have become increasingly popular sales points for consumers interested in fresh, local, farm-made products (Håkansson, 2015; Pearson et al., 2011; Van der Ploeg, Jingzhong, & Schneider, 2012). Furthermore, many new producers, who often have a different vision of what it means to be a farmer, rely on these direct-marketing channels to sell their products (Laforge et al., 2018; Milone & Ventura, 2019).

At the same time, there are growing concerns that supply management leads to product standardization, especially in egg and poultry production. In Mount (2017), an interviewed stakeholder from Ontario's chicken sector described a "cookie-cutter" system in which 1,100 supply-managed farmers "produc[e] the exact same product: same genetics, same feed, same housing facilities—you have a monoculture of chicken happening" (p. 155). While product standardization is not unique to supply-managed sectors, the quota rules in place leave little room for farmers who might wish to adopt new production and marketing practices. This problem is compounded by the fact that the investment costs needed to start production under supply management are considerable and even more so when a minimum quota is required. Furthermore, the programs that do distribute quotas to new entrants only benefit a limited number of farmers who are selected by the producer associations and receive a small percentage of new allotments (Mundler et al., 2017; Young & Watkins, 2010). Consequently, many producers engaged in direct marketing turn to other categories of livestock (e.g., ducks, geese, quails) or process their own dairy products using sheep or goat's milk, which is not under quota. However, farmers often have difficulty marketing such products due to lower demand.

As we previously illustrated, the quota exemption limits set by the provinces vary widely. For instance, a farmer in Alberta without a quota can raise 20 times the number of chickens that a farmer can in Newfoundland and Labrador (see Table 1). The push by certain advocacy groups in the most restrictive provinces to reform the system is prompted by this uneven regulatory playing field.

In response to these demands, some of the provinces where farm-direct marketing is more de-

veloped (British Columbia, Ontario, and Quebec) chose to implement certain changes. Overall, two lessons can be drawn from these reform experiences. First, when policies are enacted to accommodate small producers, the resulting output is marginal compared to the volumes of production under quota. In concrete terms, the additional amounts that have been put into circulation represent less than 0.1% and 0.6% of chicken and egg production, respectively, and only constitute a small fraction of the overall annual increase in demand. This suggests that policy reforms to facilitate the direct marketing of chickens and eggs do not have any noticeable effects on the conventional markets for these products. Such reforms also do not jeopardize the market stability that supply management is meant to protect.

Second, as Table 3 showed, the producer associations tend to adopt policy reforms that fit within the supply management framework by controlling the allocation of new permits and imposing various rules on new producers. For instance, permit holders are required to follow food safety and biosecurity regulations and, in some cases, must pay a fee to the producer association. In Quebec, program participants can even be prohibited from selling their products through certain marketing channels. Furthermore, permit holders are not recognized as members by the producer association managing the program, meaning they cannot take part in decisions or vote on proposals. As a consequence, the producers who own quotas and market their output through conventional supply chains continue to have the final say on how niche markets in local communities are developed.

Conclusion


Our objective in this study was to explore how rising demand for specialty products in short supply chains has created new challenges for Canada's supply management of egg, poultry, and dairy production. We note that new critics of the system are less focused on whether quotas are economically inefficient or entail higher costs for consumers. Instead, what is highlighted are the difficulties that the system currently faces in trying to accommodate niche-oriented farmers who wish to pursue direct marketing initiatives. Such producers tend to

run smaller farms and often play a crucial economic and social role in rural development (Kneafsey et al., 2013; Martinez et al., 2010). Certainly, one of the main arguments for supply management is that it helps maintain the presence of farms across Canada. Nevertheless, the system is increasingly coming under criticism for impeding the development of farms (both new and established) that practice alternative forms of agriculture, that directly market specialty products, and that capitalize on their relational and geographic proximity to clients and local communities.

Our analysis of quota exemption limits and minimum quota requirements underscores the significant regulatory differences that exist between provinces in Canada. Paradoxically, the most restrictive rules can be found in the more urbanized provinces (British Columbia, Ontario, and Quebec), where a considerable number of farmers sell through short supply chains and benefit from access to large consumer markets. In contrast, the quota exemption limits are higher in the Prairie Provinces (Alberta, Manitoba, and Saskatchewan), where export-driven conventional farming is more widely practiced (Beingessner & Fletcher, 2019). This is probably due to the fact that, in the more urbanized provinces, the strong growth of short supply chains is viewed as a potential problem, from both an economic and food safety perspective.

The three provinces presented (British Columbia, Ontario, and Quebec) all enacted reforms in response to growing pressure from small-scale, direct-market farmers who often struggle to grow their businesses due to their inability to obtain quotas. However, as we showed, the new programs involve strict production and, in some cases, marketing controls. Moreover, the proposals enacted so far will not, on their own, significantly improve the diversity of supply-managed products in Canada.

In conclusion, the results of our policy analysis suggest that the changes made to Canada's quota system have not eroded the regulatory powers of the provincial producer associations. While supply management policies have undeniably evolved in response to growing calls for reform from consumers, farmers, and advocacy groups, the reforms en-

acted so far have yet to meaningfully promote greater food diversity. At the same time, supply management has proven to be an effective revenue protection tool for farmers and continues to be supported by most consumers. If the system can find additional ways to accommodate new entrants, develop niche markets in local communities, and promote food diversity, it will likely maintain its legitimacy in the eyes of Canadian consumers. 

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A five-point framework for reading for social justice: A case study of food and farming policy discourse in the context of Brexit Britain

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Abstract

Food justice represents an evolving framework that puts social justice at the center of debates on how to achieve sustainable food systems. Food justice has largely been examined in community-level projects and activism outside the UK. This paper uses food justice as a framework through which to analyze food policy discourse in the UK. Our analysis presents an approach to “reading for social justice” by using the twin pillars of “distributive” (how benefits and risks are shared) and “procedural” justice (who is included) as analytical lenses. We apply critical discourse analysis to 20 policy documents published since the 2016 “Brexit” referendum. Our analysis finds that elements of both distributive and

procedural justice are present, but underdeveloped or ignored across the documents. The lack of direct attention to social justice issues in the papers was not for lack of actual social justice issues, which were implicit within the discourse. The post-Brexit discourse reproduced existing power imbalances and despite occurring at a juncture where the potential for change was high, marginalized and vulnerable voices remain underrepresented. In the context of post-Brexit Britain, as well as in any political context, we argue that if food policy-making and governance are to enable a more just and sustainable food system, a more systematic approach to incorporating social justice needs to be developed. To this end, we offer a five-part approach to “reading for social justice” when scrutinizing food and farming policy.

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Keywords

Brexit, Food Policy, Social Justice, Food Justice, Participation, Distributive Justice, Procedural Justice, Agricultural Policy

Highlights

- First systematic analysis of food policy discourse in UK in a food justice framework
- Social justice found to be only marginally present in post-Brexit policy debates
- Distributive and procedural justice needs much more attention in food policy
- Five-part framework for integrating food and social justice into policy analysis and policy-making processes

Introduction

There is growing concern over the place of food, agriculture, and food systems in society. How can we address the negative impacts of industrialized agriculture on the environment and health? How can changes in agriculture and food systems help cool the planet? And how can all this be done while addressing worsening social injustices that contribute to food insecurity and diet-related health inequalities affecting millions of people (Gottlieb & Joshi, 2010; Holt-Giménez & Shattuck, 2011)? Research and activism for more sustainable and socially just food systems have continually evolved, leading to many important practical and theoretical advances (Alkon & Agyeman, 2011). Yet, the extent to which these advances are incorporated into different national food and farming policies remains uneven.

In this article, we focus on whether social justice has been reflected in recent debates on British food and farming policy, which have been stimulated by the United Kingdom's (UK) referendum on whether to withdraw from the European Union (colloquially known as "Brexit").

Brexit will have significant implications for the UK's food system, not least because it will mean the withdrawal of the UK from the Common Agricultural Policy, which has determined agriculture and rural development policy since 1973. While this rupture could be seen as an opportunity to advance more just and sustainable policies, it could also exacerbate existing problems in the food sys-

tem related to environmental, economic, cultural, and social issues (Lang, Millstone, & Marsden, 2017).

Brexit has prompted the articulation and public performance of political positions and recommendations from a range of interests concerned with Britain's food and farming sector. Since the referendum, dozens of documents have been published, setting out proposals for how the UK government should respond. These articulations present a unique opportunity to examine an important moment of discursive production; at moments of crisis, public debate can reveal both the constructed nature of current social norms, but also the "projections of possible states of affairs" or "possible worlds" (Chiapello & Fairclough, 2002, p. 195). At this time of profound upheaval, as deep national divisions and social inequalities have been brought to the fore, we wanted to examine the extent to which public debates on food and farming have reflected similar concerns. In the complex world of food and agriculture policy, however, there is little guidance and no coherent framework for examining the processes by which social justice is articulated. To this end, this article develops and applies a framework designed to help "read for social justice" in order to analyze the extent to which current policy discourses engage with social justice issues in their framing, analysis, and proposals.

Food Justice

Food is deeply entangled with our wider economic, cultural, social, and ecological systems, touching many aspects of our lives. The problems in the dominant food systems in the UK both contribute to and reflect wider exploitative relations in society. This interdependence is often not obvious but remains implicit in our daily practices. A food justice approach applies a social justice lens to the food system, emphasizing how intersecting axes of oppression and privilege shape the experiences of differently positioned actors and groups (Holt-Giménez & Wang, 2011; Sbicca, 2018).

Food justice was first defined in the North American context (Levkoe, 2006), having emerged in part out of the longer-standing environmental justice movement (Alkon & Agyeman, 2011). Food

justice emphasizes how “just sustainability” (Agyeman, 2013) cannot be achieved without simultaneously challenging how unequal power relations—such as issues of land ownership, labor exploitation, environmental and social injustices (amongst others)—play a central role in organizing the production, distribution, and consumption of food (Alkon & Norgaard, 2009).

Food justice critiques not only the dominant food system, but also progressive initiatives that do not explicitly address these power dynamics and that often inadvertently reinforce them (Bradley & Herrera, 2016). For example, organizations working on food are often led by privileged white activists and tend to focus on issues that reflect the interests of their middle-class proponents (Mama D & Anderson, 2016; Wakeford, 2018), despite long histories of related activism by marginalized groups.¹ Activist spaces, organizations, and networks thus risk becoming irrelevant for and/or excluding the voices and bodies of nondominant actors (Cadieux & Slocum, 2015; Guthman, 2008). Despite a strong emphasis on environmentalism, many progressive efforts in the food movement—however altruistic their intention—tend to gloss over difficult social justice issues that intersect with food systems, such as those related to labor rights, inequality, and privilege (Allen, FitzSimmons, Goodman, & Warner, 2003). Food justice, at its core, entails a commitment to centering these power inequalities in the analysis and actions for food system change (Sbicca, 2018).

Food justice varies in different contexts and geographies and is most appropriately articulated in a place-based and context-specific approach (Moragues-Faus, 2017; Slocum, 2018); however, the particularities of these different experiences of food justice in different locations are only just beginning to be understood (Anderson, Bruil, Chappell, Kiss, & Pimbert, 2019). Further, the concept of food justice has focused predominantly on analyzing the politics of grassroots community organizing and has only marginally been applied specifically in the context of policy (e.g., Horst, 2017). The goal of this paper is thus twofold. First, we ex-

amine food justice in the UK, adding to the small body of literature on food justice in this context. Secondly, we examine food justice within the realm of policy and develop a framework for “reading for social justice” to evaluate policy discourse.

Food Justice in the UK

While issues related to the environment and public health are now gaining more prominence in debates on food and farming in the UK, issues of inequality, power imbalance, and social justice have received less attention. Food justice is most commonly invoked in relation to food poverty (or food insecurity), with campaigners and academics highlighting and problematizing the proliferation and institutionalization of food banks and other forms of charitable food provision as an increasingly entrenched part of the UK foodscape (Saxena & Tornaghi, 2018). There is a considerable body of critical scholarship that advocates for a rights-based approach to addressing food poverty (Dowler & Jones Finer, 2003; Dowler & Lambie-Mumford, 2015), although this is not often situated within an explicit food justice framework.

Contemporary activism and organizing related to food in the UK are rarely framed in terms of either social justice or food justice but rather emphasize sustainability and health (Kneafsey, Owen, Bos, Broughton, & Lennartsson 2017; Mama D & Anderson, 2018). There are, however, growing numbers of UK-based community initiatives such as urban community gardens and urban farms that are adopting food sovereignty, food justice, the right to food, and other critical frameworks (Anderson et al., 2016). More specifically, small clusters of activists and scholars are directly and critically claiming the importance of social justice and working to bring issues around privilege, oppression, decoloniality, anti-racism, and gender transformation into the discourse on food and farming (e.g., Mama D & Anderson, 2018).

Frameworks for Reading for Justice

There have been some efforts to propose different principles or tenets that underpin food justice. One

¹ For examples of related social justice activism by “marginalized” groups, see the Women’s Environment Network (<https://www.wen.org.uk>) or Decoloniality London (<https://www.decolonialitylondon.org>)

of the most cited approaches has been Cadieux and Slocum's (2015) proposal of four "nodes"—"trauma/inequity," "exchange," "land," and "labor"—around which the "doing" of food justice organizing occurs. Horst (2017), applies this four-part framework to municipal planning policy in Washington State, updating it to include a fifth consideration that focuses on evaluating policies for democratic processes. This also resonates with Moragues-Faus's (2017) work examining food justice in media discourse in the UK, where participative justice emerges as an important, albeit weakly represented, aspect of discourse.

While helpful in terms of unearthing some key issues in grassroots activism, these dimensions arose out of a specific US-movement context. Thus, although these "nodes" are meant to hint at the key aspects or principles of food justice, they are arguably too specific to use as a lens to read for justice in policy or contexts outside of the US. Focusing on these important nodes would surely lead to important insights in these areas, but risks missing key, emerging, or surprising social issues. For example, rather than focusing on land as a starting point, it is useful to begin by thinking more broadly about distributive justice issues in relation to multiple resources, as we discuss in our analysis below.

Moreover, in talking about "doing" food justice, these approaches beg the question about the complementary process of what it means to "say" justice. As Fairclough (2010) reminds us, discourse is about how questions of what is possible to say and think affect what is "do-able." In this respect, we propose an accompanying process to the above examples that targets these questions, specifically in the policy realm.

In this light, we stepped back from examples of food justice in localized practices (e.g., US) to identify fundamental social justice principles that lay the theoretical groundwork for food justice. Reading through the literature, we identified two repeating themes in food justice definitions: (1) "distributive" justice (Horst, 2017; Moragues-Faus, 2017); sometimes referred to in terms of "access" (Bradley & Herrera, 2016; Longo, 2016); and (2) procedural justice (Horst, 2017; Moragues-Faus, 2017), variously referred to as "ownership and governance" (Bradley & Herrera, 2016) or

"community involve[ment] in the organization and structure of the food system" (Longo, 2016). In other words, these two dimensions of social justice frame a critique not just in terms of *what* is distributed but *for whom* and *by whom* the benefits and burdens of the food system are mobilized. We begin by offering a critique of the policy documents on these two dimensions of social justice in the Results section before presenting, in the following section, an elaborated framework "reading for social justice" that is specifically tailored to future policy analyses.

Methodology

Echoing Gibson-Graham's (2006) approach to "reading for difference" and "reading for absences," we have read our selected texts with the goal of "uncovering what is possible but obscured from view" and excavating "what has been actively suppressed or excluded" (pp. xxxi–xxxii). We use critical discourse analysis (CDA), a systematic approach to the analysis of language. We used this approach as it offers two main advantages: first, its ability to analyze the role of discourse in setting the boundaries of current and future possibilities; and, second, its attention to issues of social justice. Regarding the first, as Chiapello and Fairclough (2002) remind us, "discourse is not a closed or rigid system, but rather an open system, which is put at risk by what happens in actual interactions" (p. 194). We examine policy discourses in the "Brexit moment," a moment in which established and normalized practices can be surfaced and critiqued and alternatives can be proposed. Bearing in mind that food justice is a framework that has emerged from the grassroots, our objective was to analyze these (largely mainstream) texts on food and policy in order to understand the extent to which they aligned with issues of social justice.

Secondly, CDA is not a disinterested analysis; it is invested in "normative" discursive production, meaning that it is invested in explaining, as Fairclough and Fairclough (2012) put it, "why and how existing social realities endure despite their damaging effects" (p. 3) and (by implication) how to change them. This approach resonated with our specific objective of "reading for social justice." CDA can "help to facilitate learning through

critical questioning, and thereby help open up the horizon-constituting potential of deliberation for producing alternative imaginaries and strategies” (Fairclough & Fairclough, 2012, p. 23). Policy-making should, in other words, be approached as an opportunity for transformative learning (Anderson, Maughan, & Pimbert, 2018). For this reason, we conclude with our five-point framework (Figure 1), which is specifically intended to inform and strengthen transformative policy making and analysis.

We conducted a systematic search for texts that were written after June 23, 2016—the date of the UK referendum to leave the European Union—and up until November 2017.² On an initial search, we found 25 documents. We chose to analyze only documents published by civil society organizations and government, which a) spoke directly to post-Brexit policy on food and farming and b) that gave recommendations for policy changes. From the initial set of 25 documents, we eliminated five that did not fit these criteria. We started by reading each text once through, discussing general patterns, then entering all documents into NVivo Qualitative Data Analysis software. We then collectively conducted a basic content analysis, identifying (a) what they sought to distribute and (b) whom they envisaged benefitting and participating (i.e., distributive and procedural justice). We then discussed and agreed on an initial coding structure. The remaining documents were then coded by the lead author and the emergent analysis developed iteratively in discussion between co-authors. The application of codes was subsequently reviewed by all co-authors, adjusted accordingly, and a final coding structure agreed upon.

During this coding process, our

initial categories of distributive and procedural justice were modified; for example, under distributive justice, we settled on four subcategories of resources and advantages that the documents dealt with: land, food, public goods, and labor. This structure provides the form of our results and analysis and is presented in the following sections.

Results

Characterizing the Documents and their Commissioning Organizations

To begin our analysis, we asked some basic questions to help situate the documents within the overall policy landscape: What are the organizations behind these documents? What do they stand for? And what do they aim to achieve through their documents?

The commissioning organizations can be char-

Figure 1. A Framework to Support a Process of “Reading for Social Justice” in Order to Evaluate Both the Content of Policies and the Processes through which Policies are Discussed, Formulated, and Decided Upon



² Given the unforeseen length of the Brexit process, we return in the section “A Framework for Reading for Social Justice in Policy Discourse” to resituate our documents in light of subsequent Brexit-related events.

acterized as falling into one of three categories (Table 1). Twelve organizations were nongovernmental organizations (NGOs), including charities,

think tanks, and campaigning coalitions. Some of these are well known in UK food and farming debates; for example, Compassion in World Farming,

Table 1. Characterization of the 20 Documents, Their Authors, Organization Type, and Principal Aims

Author (abbrev.)	Title	Type	Words
Nongovernmental Organizations			
Centre for Policy Studies (CPS)	<i>Pointmaker: Brexit, Agriculture and Agricultural Policy</i>	Free-market policy think tank	9,651
Compassion in World Farming (CIWF)	<i>Sowing Fresh Seeds: Food, Farming, and Animal Welfare Post Brexit</i>	Campaigning and lobbying charity (animal welfare)	9,551
Countryside Alliance	<i>Brexit Policy Document: Sustaining a Living and Working Countryside Outside of the European Union</i>	Campaigning and lobbying charity (rural issues, hunting, farming, etc.)	8,851
Eating Better	<i>Beyond the CAP: Policies to Support Better UK Meat and Dairy Production Post-Brexit</i>	Campaigning and lobbying coalition (healthy and sustainable food)	7,107
GM Freeze	<i>GM Freeze Briefing—Brexit and GM</i>	Campaigning and lobbying group (genetic modification)	1,186
National Trust	<i>The Future of Our Countryside</i>	Conservation charity	1,195
New Economics Foundation (NEF)/Global Justice Now	<i>Agricultural Subsidies in the UK After Brexit: A Progressive Solution</i>	Left-wing think tank (NEF); Campaign group on Global South development (Global Justice Now)	18,396
A People's Food Policy (PFP)	<i>A People's Food Policy: Transforming our Food System</i>	Coalition of civil society campaigning organizations	44,373
Policy Exchange	<i>Farming Tomorrow: British Agriculture After Brexit</i>	Center-right think tank	27,022
Soil Association	<i>The Future of British Farming Outside the EU</i>	Campaigning charity (food and farming)/certification body (organics)	18,068
Sustain	<i>Beyond 2020: New Farm Policy</i>	Sustainable food charity/campaigning	3,975
UK 2020 (authored by Paterson)	<i>UK Agricultural Policy Post-Brexit</i>	Center-right think tank	7,324
Unions and membership organizations from the agri-food sector			
Fairlie/LWA/Greens	<i>Farming Policy After Brexit: A Report for The Greens</i>	Campaigner/member organization for small-scale producers and family farmers	27,559
Food and Drink Federation (FDF)	<i>FDF Manifesto 2017</i>	Members organization/industry representation (UK food and drink manufacturers)	2,852
The Landworkers' Alliance (LWA)	<i>Making Food Sovereignty a Reality: Recommendations for Post-Brexit Agricultural Policy</i>	Member organization for small-scale producers and family farmers	9,382
National Farmers' Union (NFU)	<i>Policy Statement: Next Steps for Agricultural Policy—A New Deal for Society</i>	Member organization/industry association for farmers in England and Wales	1,722
Tenant Farmers Association (TFA)	<i>A Post EU Farming Policy for Britain</i>	Member organization/industry association for tenant farmers in England	1,596
Ulster Farmers' Union (UFU)	<i>UFU Discussion Document Brexit: Options for a New Domestic Agricultural Policy</i>	Member organization/industry association for farmers in Northern Ireland	1,652
Governmental Organizations			
All-Party Parliamentary Group on Agroecology (APPGA) (authored by Mansell)	<i>Inquiry into Trade Post-Brexit Briefing Paper</i>	Informal, cross-party, interest group for MPs and Peers	4,913
House of Lords—EU Committee (HoL)	<i>Brexit: Agriculture</i>	Government select committee (House of Lords)	41,721

The National Trust, and The Countryside Alliance. These organizations have large memberships, have existed for many decades, and are influential in terms of farming and land use in Britain. The National Trust, for example, is the nation’s largest farm owner, with more than 250,000 hectares of land and more than 1,500 tenant farmers (National Trust, n.d.). Others are less well known; for example, A People’s Food Policy, GM Freeze, and UK 2020 (authored by Paterson)—these are comparatively new, and what they stand for is perhaps less well understood by the general public. The second group (six organizations) is made up of unions and membership organizations from the agri-food sector. In this group only two are particularly well known at a national level: the National Farmers Union (NFU), with over 55,000 members, and the Food and Drink Federation (FDF), representing over 300 companies. Others are, again, much smaller and operate with small memberships and financial turnovers. The final group (two organizations) is composed of governmental bodies, one being a branch of government (The House of Lords) and the other an informal cross-party parliamentary group (the All-Party Parliamentary Group on Agroecology [APPGA]).

It is clear that the different publications are intended for a range of audiences. For example, the reports by the House of Lords (HoL), the Policy Exchange (a leading UK think tank), and Simon Fairlie (a well-known ecologist and author) are aimed at specialist audiences. Reports by civil society organizations such as the Soil Association, Eating Better, and Sustain are aimed at a wider public,

and use accessible graphic design and plain language to break down complex food and farming policy into manageable sections.

Distributive Justice

All of the documents made claims for how resources should be reallocated, post-Brexit. The prospect of leaving the EU opened up a renegotiation of the ways in which public funds are distributed, and also for the application of regulatory and legislative instruments with redistributive intent. As such, the proposed changes could have important implications in terms of “distributive” justice, i.e., the form of social justice that concerns the “distribution of material or economic advantages” (Olsaretti, 2018) throughout society, as well as the conditions under which individuals can access such advantages. We present the following sections using the four main categories of resources and advantages that the documents dealt with: land, food, public goods, and labor (Table 2).

Land

Land concentration can be considered one of the greatest injustices underlying the UK’s food system, reflecting a history of land enclosure and unequal power relations going back over 1000 years (Shrubsole, 2019). The current pattern of land ownership not only presents practical impediments to shifts towards sustainability but represents the “most neglected issue in British politics” (Monbiot et al., 2019). While land per se was a prominent concern of the majority of documents (17 of 20), the most common approach to land policy was

Table 2. Summary of Documents in Terms of the Various Categories of “Distributive Justice”

Category	Subcategory; no. of documents; commissioning organization	Total
Land	<i>Land use</i> (11): APPGA; CIWF; Countryside Alliance; CPS; Eating Better; HoL; National Trust; Policy Exchange; Soil Association; UFU; UK 2020	17
	<i>Land ownership/access</i> (6): Fairlie; LWA; NEF; PFP; Sustain; TFA	
Labor	<i>Access to labor</i> (9): APPGA; CPS; FDF; HoL; NFU; Policy Exchange; TFA; UFU; UK 2020	16
	<i>Labor conditions</i> (7): Fairlie; FDF; HoL; LWA; PFP; NEF; Sustain	
Public goods and/or access to nature	<i>Public goods</i> (13): HoL; UK 2020; Policy Exchange; Sustain; National Trust; Soil Association; CIWF; LWA; PFP; Countryside Alliance; APPGA; NEF; TFA	19
	<i>Natural capital</i> (6): CPS; HoL; NFU; Policy Exchange; UFU; UK 2020	
Food access	CIWF; Eating Better; Fairlie; FDF; LWA; Soil Association; Sustain; UK 2020	8

land use (addressed by 11 of 20 documents). This included suggested changes in the way land is managed, what is grown on it, and what measures might be introduced to incentivize less environmentally damaging farming practices. Organizations like the Soil Association, Policy Exchange, and APPGA, for example, call for some variation on a comprehensive land management scheme. These schemes aim to deliver “a cost-effective approach to mitigating carbon emissions” (Policy Exchange, 2017, p. 9), but also as a means to “[improve] production efficiency” (UFU, 2017, p. 4). UK 2020 (2017) is perhaps the most strident in its declaration that “the first priority in growing the rural economy must be to increase food production” (p. 4).

Just over a quarter of the documents (six out of 20) addressed the issue of land ownership, control, and access. Land ownership in the UK is highly concentrated. While estimates vary, some suggest less than 1% of the population (i.e., some 25,000 individuals) own more than half the land (Shrubsole, 2019). A clear account of who actually owns the land in the UK is further obstructed by the lack of a publicly accessible land registry (Monbiot et al., 2019). Such problems might reasonably be expected to be a priority for any organization interested in the future of the UK food system. However, problems associated with land tenure and land concentration are hardly mentioned across the documents, and proposals for land reform are dealt with by only three of the 20.

Where land access was addressed, it was by proposing measures to support new entrants who are locked out of farming because of inadequate access to land, by changing the subsidy system to end public direct payments to large landowners (TFA; NEF), or by combining the two approaches, as is the case with LWA, Sustain, and PFP. In one other instance, land access issues were mentioned, but only in regard to identifying “land that can be used for housing or commercial development, sharing the planning uplift with the original farmer” (Policy Exchange, 2017, p. 45). In his report for the Green Party, Fairlie (2017) takes a particularly strong line on the injustices in land ownership and the need for land reform, invoking the “right of people to engage with the natural

world through farming and similar land-based activities” (p. 15). The PFP (2017) offers a raft of policies, even including those which draw on “the government’s extraterritorial human rights obligations and in order to address land grabbing and human rights violations overseas” (p. 53). Rights-based claims regarding access to land are missing from the rest of the documents, and around three quarters (16 out of 20) do not deal with land access at all. None of the documents specifically mentioned the issues of access to land for minority groups, including women, or ethnic minorities, which has been a lynchpin of food justice discourse in the North American context—and is certainly an issue in the UK (though there is very little research on this topic).

The documents that consider changes to who owns the land are a small and isolated minority. Despite strong evidence of the role of land concentration in limiting land-use changes (Zondag, de Lauwere, Sloot, & Pauer, 2015), the absence of land reform in these documents is a failure to address one of the most fundamental food justice issues. The Countryside Alliance (2017), for example, pushes the importance of “traditional land management in creating and maintaining some of our most iconic rural landscapes” (p. 17), but does not cite land tenure reform as a means to achieving this. This omission is striking, given the impact of large-scale industrialization in undermining traditional farming practices. In short, silences around land reform demonstrate the “unsayable” nature of land reform in the mainstream policy landscape.

Labor

In the UK, labor has particular relevance within the food system and to issues of social justice. Around 392,000 people are employed in food and drink manufacturing, and almost a third of these are EU migrants; food and drink is the country’s largest manufacturing sector, yet many of the workers are employed on low-wages and/or precarious contracts (Heasman & Morley, 2017). It is estimated that 48% of the workforce in the food industry is classed as low paid (twice as much as for the economy as a whole) (Fabian Society, 2015).

Labor was a key focus across the documents, featuring in 16 of the 20 reports. The most com-

mon way it was discussed, however, was in terms of “access” to labor, particularly “unskilled” or “seasonal labor” (CPS; HoL; UK 2020; APPGA; NFU). The NFU (2017), for example, advises that the UK government “ensures the industry’s labour needs are met” (p. 1). Elsewhere, the discussion taps into fears, as APPGA (Mansell, 2017) put it, that a “failure to secure this labour-source could add substantially to the cost of producing” (p. 2). In this sense, the dominant narrative across the documents reflected labor as a *commodity*.

A minority of documents (seven out of 20) focus on the interests of workers, such as conditions and pay. Two of these, however, pertained to less precarious “skilled labor” such as veterinarians or “sector-specific” tasks such as abattoir workers (FDF and HoL). The issue of non-agricultural labor in the food system (i.e., in food manufacturing and catering) was only mentioned in two of the documents (PFP and FDF). Despite recent increases in the prominence of migration issues, both in food systems and outside them (IOM, 2018), the issue of gang-labor exploitation (especially of migrants) was notably muted (or even absent) in all but seven of the documents. Where it is discussed, it is again routinely from the perspective of employers: “the pig industry,” the HoL report (2017) tells us, “would struggle to survive without migrant labour” (p. 68).

Despite the particularly stark gender pay gap in agriculture and rural areas (Farmer’s Weekly, 2015; Recanati, Maughan, Pedrotti, Dembska, & Antonelli, 2018), women are mentioned in only one document (PFP). In addition, only two reports (Sustain and PFP), make any mention of reviving the Agricultural Wages Board—one of the most cited mechanisms for tightening labor regulations for the most precarious in the food system (Devlin, 2016; Sustain, 2018). Similarly, Sustain (2017), which also calls for the “Living Wage” for “farmworkers,” calls for “a new agricultural worker collective bargaining body,” noting its capacity to “protect workers from abuse” (p. 6).

Two main issues are of relevance here. Firstly, the tendency to frame labor as a “resource” rather than a rights issue. When labor is considered only as a resource, the human impacts of increased casualization, declining pay, and poor working condi-

tions are disregarded. Compare the NFU’s emphasis on “the industry’s labour needs”—which talks of labor in the same way it might talk about electricity supply—with the LWA’s proposal to address migrant labor issues. The LWA frames this in terms of “welfare,” but also envisages beneficiaries beyond their membership (e.g., producers in the Global South). The distinction is subtle but important for building an argument and a broad-based movement to improve labor conditions.

The second issue is the failure to draw links between conditions relating to agricultural labor and food labor more generally. Only one document (PFP) makes any explicit reference to workers in the foodservice industry. The PFP gives substantial consideration to food workers, grouping them with “vulnerable workers and migrant workers” across the food system. The connection between agricultural policy and food policy is a fraught one; however, calls are increasing to link the two (Candel & Pereira, 2017; International Panel of Experts on Sustainable Food Systems [IPES-Food], 2019). To ignore these commonalities is to miss the interdependence of cheap food (at great environmental cost) and cheap labor (at great human cost) (Patel & Moore, 2017). Moreover, failure to discuss these interdependencies is strategically limiting: if it is not possible to talk about the things that are crucial in the pursuit of *just* sustainability—building cross-sectoral alliances, achieving policy coherence, and creating more participatory forms of governance—then what is chance of *doing* them? (For more on this see the Framework for Reading for Social Justice in Policy Discourse section, below).

“Public goods” or access and use of nature and ecosystem services

Agro-ecosystems offer innumerable benefits; however, access to them is highly uneven throughout society. In the documents, access to nature and ecosystem services was a prominent concern (19 out of 20 documents), though it was most often framed from the perspective of the provision of “public goods” (discussed in 13 of 20 documents). As one organization defined it, public goods are “product[s] that one individual can consume without reducing its availability to another individual, and from which no one is excluded” (Sustain,

2017, p. 2). The notion of public goods has an inherent food justice dimension for two main reasons: firstly, because the goods arising from food systems (such as sustainable, healthy, and nutritious food) are accessed in uneven ways by differently positioned actors, but also because defining and setting public goods is a matter of public discourse. In other words, who gets to decide what these goods are, how they are delivered, and who benefits, depends on who has the power to influence the debate.

Many documents made general claims for the need to ensure that the agricultural system (and private landowners) is supported to provide public goods, but there was little emphasis on unequal access between different sub-groups within “the public.” Further, exactly how the natural environment is valued and how it fits into broader economic and social logics varies extensively in the documents. As one report put it, we need

‘payments for goods that go beyond food production—for the wildflowers, bees and butterflies that we love, for the farmland birds, now threatened, for the water meadows and meandering rivers that will help prevent the flooding of our towns, and for the rebuilding of the fertility and health of the soils on which both nature and production depend.’ (National Trust, 2016, para. 7)

Here the emphasis is on the aspects that often escape valuation in agricultural policy, but that nonetheless are of great value. Broadly speaking, such interventions were reflective of an overall dissatisfaction with previous iterations of the CAP and its distorting effects (on both markets and natural environments). For example, Owen Patterson (former Secretary of State for Environment, Food and Rural Affairs), despite championing economic competitiveness, still felt the need to point out in the UK 2020 report that while some can “compete with global markets, there are others [for] which food production cannot be the sole means of generating income. These areas will particularly benefit from a system to reward and sustain farmers for their environmental and conservation work” (Paterson, 2017, p. 16).

A distinction emerged in the documents between “market-oriented” and “rights-based” conceptions of how and why public goods should be provisioned. Consider, for example, the framing evident in the excerpt from National Trust’s document cited above. This formulation frames nature not as a commodity or factor of production, but as “the things we love” that should be paid for with public money—quite distinct from, for example, the Policy Exchange’s (2017) vision of “creating a competitive market for the provision of ecosystem services” (p. 9) or the NFU’s (2017) desire to ensure farm income by “recognis[ing] and reward[ing] the environmental goods that farmers deliver” (p. 1).

It is the House of Lords (2017) report, though, that provides the clearest example of a market-based approach. This report suggests that the high standards integral to the provisioning of public goods “were crucial to the British brand” and on this basis recommends that “the Government should, therefore, maintain the current standards to enable the export of UK food and farming products” (p. 43). Such an approach, as numerous commentators have suggested (McCarthy & Prudham, 2004), can easily obscure the inherent nonmonetary value of public (and common) goods, such as public access to nature and benefits for future generations.

The wide range of possible public goods may appear odd; however, as already stated, it is a well-known feature of public goods discourse (Touffut, 2006). Public goods may function here to artificially conceal the extent of disagreement among key agri-food stakeholders. For example, there is a disparity between market liberals like UK 2020 and Policy Exchange, centrist NGOs like the Soil Association and CIWF, and food sovereignty advocates like LWA and PFP. Yet all of these organizations appear to recognize the term, positioning their more specific (and contrasting) policies within it. This is of obvious benefit to the government who wishes to appease otherwise divergent interests. Indeed, they have actively promoted the term—for example, in their “Health and Harmony” Green Paper (Defra, 2018a), in which they used the term to mean anything from “climate change mitigation” to “improved produc-

tivity and competitiveness.” The regulatory power of forthcoming legislation will likely be weakened by this vagueness.

“Food access”

The United Nations’ Food and Agriculture Organization (FAO, 2006) defines food access as “access by individuals to adequate resources . . . for acquiring appropriate foods for a nutritious diet” (p. 1). This concept normally puts considerable emphasis on the structural constraints (such as poverty) that modulate the ability of individuals and groups to access food, rather than its physical availability. While such a conception glosses over important factors such as health and nutrition, food access is strongly connected to food justice, which, as we have seen, highlights the often-invisible constraints that keep certain individuals and groups in positions of deprivation.

Food access was mentioned by eight out of 20 of the reports; however, very few actually address the issue in great detail. The documents that address food access offer a wide range of options, including taxation to fund the subsidy of “nutritious” food (EB; CIWF; SF), right to food legislation (PFP; LWA), public awareness-raising about “healthy eating on a low income” (CIWF, 2017, p. 1), public procurement (Soil Association; Sustain), subsidies and loans for horticultural producers (Sustain), and passing on savings to consumers by leaving the Customs Union (Paterson, 2017).

Also included in this analysis are those documents that talk about “poverty,” which is also understood to denote structural constraints on the ability of individuals and groups to feed themselves. Accordingly, the issue is often talked about as part of a wider strategy. For example, the Soil Association (2017) talks about “a joined up approach . . . taking account of public health, food poverty and international development” (p. 8). The LWA (2017) also advocates for government-implemented schemes such as “food stamps” and subsidies on local produce as a way to “alleviate food poverty” (p. 6). That said, food poverty is also mentioned in some documents but not as part of any particular strategy (PE; CIWF; NEF). Finally, there were only two documents (NEF and Fairlie) that considered the implications of food and farm-

ing policy for food security (as well as ecosystems, etc.) elsewhere in the world. The NEF (2017) argues that “the most important principle for a new UK subsidy system is to do no harm to producers in the global south” citing the role the UK plays in feeding the “world’s population” (p. 4).

Only two documents (PFP; Sustain) mention food banks, and only a handful more give any indication that food access and food poverty are pertinent issues for discussion. One fairly straightforward reason for this discrepancy might be that most of the documents did not consider it to be within their scope. The vast majority have a principal focus on agriculture, and in the European context, policy debates have been dominated by the issue of agricultural subsidies. As the NEF (2017) put it, food access is “not easily influenced through the policy tools of agricultural subsidies” (p. 10), and as a result, they chose not to discuss it. The NEF is candid about its rationale; elsewhere, no discussion is given at all. Whatever these reasons, the practical result is the presentation of food access and those who eat food as a fringe concern, separated from issues of agriculture and production, an idea that is further entrenched by those who remain silent.

Even when food access is discussed as a policy issue, considerable divergence can be observed in ways that reflect different political positions and imaginaries of social change. On the one hand, documents advocating for a “right to food” approach are based on an “official recognition that food is not a commodity but a basic human right” (LWA, 2017, p. 17; also PFP), positioning the state as the ultimate guarantor. Other proposals seek to improve the food environment through various public health initiatives. Eating Better (2017), for example, calls for the use of “fiscal measures such as introducing VAT or other tax on some types of livestock products” to “subsidise healthier foods.” Sometimes these proposals were fairly vague—e.g., calls for the government to “create a new food culture” (CIWF, 2017, p. 6)—though sometimes (again especially with PFP) they were attached to concrete proposals to implement laws and create institutions (or strengthen existing ones) to help build a healthy food environment. These approaches were unified by their targeting of

underlying structural causes.

In contrast were those documents that envisaged the operation of the market as the best method for delivering increased access. For example, the FDF (2017) suggests that improvements to food access will be secured by growing “a more competitive and productive supply base, delivering resource efficiency, quality and traceability from farm to fork” (p. 6). This example points out the way—much like with “public goods”—that social problems around food can easily be reframed as market issues. Other organizations do this, too—the CPS (2017), for example, calls for an arrangement “which meets consumers’ needs in terms of the availability of nutritious food at reasonable prices” (p. 14), echoing a long-standing emphasis on a cheap-food policy for all as the best means to address food insecurity. Framing the issue in exclusively consumer terms can make invisible certain forms of need that cannot be met by market mechanisms (e.g., extreme poverty) nor solved through “reasonable pricing.” This is in contrast to more active formulations of political subjects such as “citizens,” or even “eaters” (in the case of *Eating Better*), which are compatible with the human right to adequate and nutritious food.

Procedural Justice

As food justice advocates often point out, how people are engaged in decision-making has an important bearing on what changes are actually made, and their capacity to benefit those most in need (e.g., Horst, 2017; Moragues-Faus, 2017). As such, we were interested to find out to what extent “procedural justice” was reflected in these documents by asking both *who* was involved and *how*.

Appeals in the policy documents to reforms in governance

Less than half (nine out of the 20 documents) discuss issues of governance and decision-making processes. Those that do, make clear calls for increased public participation; for example, the National Trust (2016) calls for “the public in the debate, along with organizations who have experience and insights to share” (para. 17); similarly, Fairlie (2017) suggests establishing “a forum of like-minded organizations” (p. 40) to help advise the government, and Sustain (2017) points out that

“local decision making . . . needs urgent but careful work” (p. 4). Market solutions are represented too—Policy Exchange (2017), for example, calls for the government to “work with local areas” to develop “industrial strategies” (p. 54). One special case is the LWA. While basing their report around food sovereignty—one pillar of which is to “put control locally” (Global Justice Now, n.d.)—they do not actually deal directly with the issue of decision-making, and are mentioned here only because of the implicit connections between the idea of food sovereignty and democratizing food systems.

Only a small fraction of the documents go into any detail on the issue. The PFP (2017), for example, outlined a democratic deficit as a fundamental problem underpinning larger problems in the food system and then suggested a series of policies to “establish democratic structures and mechanism for public participation in food policy-making and governance” (p. 28). This proposal included establishing statutory “food partnerships” in each regional, metropolitan, and local authority that would feed into a national people’s food policy council—each of which would involve broad and diverse civil society participation. The only other document to provide any detail was by the NEF (2017), which recommended establishing a “participatory representative body with a public interest mandate” modeled after the “Brazilian national council, CONSEA” (p. 24).

The extent of participation in the production of policy positions

In addition to proposals for procedural justice, we were also interested in examining to what extent the documents themselves were produced in ways that reflect participatory and procedural justice. There was very little evidence of explicitly democratic procedures being built into the drafting of the documents themselves. In fact, there was a preponderance of single-author, or elite group-authored documents: authorship statements like “Dame Helen set out six principles that any new system must deliver for the public” (National Trust, 2016, “The future of farming,” para. 1) and “words by James Somerville-Meikle” (Countryside Alliance, 2017, p. 22) were common. Even NEF, while offering some of the more stridently demo-

cratic policy proposals, used elite consultation as their central methodology. This methodology, they state, “allowed us to identify the important concepts and ideas already being debated, and those that needed to be brought into the debate” (2017, p. 9).

In a large number of cases, no description of the drafting methodology was given at all. For example, unions and members organizations routinely run consultative processes with their members (we know this happened in the case of LWA), but most make no mention of it in the documents themselves (UFU, TFA, NFU, FDA). In one case, the House of Lords report, some degree of participation was built into the public hearing format. The report itself does not provide a great amount of detail on this or what opportunities (if any) there were for public participation. However, it does signal to an impressive repository of individual testimonies provided by the hearing’s expert witnesses.

Beyond this, there were only two instances of expressly participatory processes being used in the document drafting methodology. The first is the Eating Better (2017) report, which informs us its outcomes were “developed in collaboration with . . . over 50 civil society organizations working to build consensus and develop collaborative practical approaches” (p. 2) for food system transformation. This is in marked contrast to the detail given—and very deliberately emphasized—by the authors of the PFP. The document includes a wide range of policies designed to address public participation in food and farming policy-making directly—for example, the “statutory food partnerships” already mentioned, as well as “a National People’s Food Policy Council” (2017, p. 29). Importantly, the document also describes how such principles were built into the drafting of the document itself, including “consultations, workshops and a survey” with input “from over 150 organizations [. . . from] across the food system and civil society” (2017, p. 21). The PFP also expressed an intention to expand participation by including “those who haven’t supported this work to find out where the differences in our positions and ideas are and reconcile them” (2017, p. 94).

Elsewhere, the lack of detail on either the topic of democratic governance or participatory policy-

making is perhaps one of the biggest ironies of the Brexit process, a process ostensibly intended to reclaim political sovereignty: a “once-in-a-generation opportunity” (Defra, 2018b) to make a more democratic and prosperous nation. Shortcomings such as this illustrate the extent to which the Brexit discourse has been seriously affected by the fear of economic shock and political division. Moreover, since these documents were composed relatively early on in the Brexit process, they also demonstrate that such constrained thinking has been active from the outset. Despite some standout documents (such as PFP, LWA, and Sustain), on the whole, the organizations represented in this study played it safe, in effect protecting vested interests rather than advancing a broader vision of ecological and social justice.

The limited nature of the proposals in these documents represents a missed opportunity to use the “Brexit moment” to redress shortfalls directly in democratic governance. This is in tension with calls for more substantial civic participation in food system governance. The National Trust (2016) document exemplified this contradiction, despite being solely based on the thoughts of a member of the House of Lords (see above), as it still advised “ministers to now consult widely on the way we fund farming in a post-Brexit world and involve the public in the debate, along with organizations who have experience and insights to share.”

Stepping back and looking at who is reflected in the documents, it is notable that there are no organizations that explicitly include representation of marginalized and vulnerable groups (BEM, migrant workers, women, etc.), meaning that the discourse is being (re)produced by those who already benefit disproportionately from it. This clearly has implications regarding the extent to which the discursive arena itself, and the production and negotiation of discourse on food and farming policy, can reflect diverse interests and needs. This shortfall is worrying—without a clear intention to build participation of diverse groups (especially marginalized ones) back into the food system, the social divisions which gave rise to Brexit in the first place may even widen. In the following section, we set out a five-part framework for “reading for social justice.” Presented as a series of questions, this

framework is designed to help advocates, policy-makers, and organizers to reflexively scrutinize policy positions and processes in terms of often-hidden “distributive” and “procedural” justice issues.

A Framework for Reading for Social Justice in Policy Discourse

While the empirical research of this study focused on publications produced in a discrete period in the immediate wake of the Brexit referendum (June 2016 to November 2017), much has unfolded in the intervening months, not least a landslide general election victory for the Conservative Party and final confirmation that Brexit will happen on the 31st January 2020. In addition, numerous parliamentary bills have been drafted and debated; the agriculture bill, for example, triumphantly announced the introduction of a “public goods” framework, but also saw a failed attempt to introduce an “agroecology amendment.” Similarly, the passage of the trade bill has created controversy around the lowering of labor and food quality standards threatened by a USA-UK free trade agreement. Public concern was especially enflamed when government papers were leaked, suggesting such a deal would “severely limit” Britain’s ability to negotiate an equivalent agreement with the EU (Pickard, 2019).

Outside parliament, the conversation has also continued. Of particular note, was the visit by the United Nations (UN) Special Rapporteur on extreme poverty, Philip Alston, who described the role of government policies in the “systematic immiseration [economic impoverishment]” of a significant part of the UK population (BBC News, 2019). Numerous other significant discursive moments have occurred, such as the launch of the National Food Policy consultation and the release of findings by the RSA special report on food and farming, which stressed, among other things, reorienting food systems for public benefit (RSA, 2019).

The majority of topics in the public debate have been around public health and food quality issues (e.g., concern over the possibility of chlorinated chicken being allowed in the UK) (Lawrence, 2019). In contrast, issues of lowering labor standards, entrenched food poverty, and other food justice concerns have received far less attention. Thus,

the pattern we observed in our empirical analysis of the first wave of post-Brexit policy positions (in the 20 papers we analyzed) generally repeats itself in today’s debates where social justice issues are muted or unsurfaced. While explicit attention to social justice was rarely considered on the surface of many of the documents we analyzed, the implications for social justice lurk in the shallow waters of the debates. Our approach to “reading for social justice” is designed to help to get below the surface and wade through the unarticulated, but multidimensional, depths of social justice issues.

To this end, we offer below a framework that discusses our findings to further develop our initial focus on distributive and participatory justice. This framework has evolved out of a combination of our analysis of sample policy documents and existing food justice literature; it is offered both for the ongoing context of Brexit policy-making, but also as a set of principles to deepen the analysis of policy production in general. As a political process of “deciding what to do,” policy is a privileged site of discursive production that sets limits on both what we can say and what we can do. Criticism of policy must be conducted systematically and reflexively if we have any hope of shifting its horizon of possibility.

Do the policies enable the distribution to (and participation of) the most marginalized?

As we have seen, all engagements with Brexit have been to some extent about redistribution—whether it is about redistributing benefits to the general public or small farmers, or allocating public funds to farmers who are producing public goods. However, the engagements that most reflect a food justice perspective are those that have adopted a more critical and wide-ranging stance. In respect to the distributional issues discussed above, it is important to consider not just how small farmers can access land, but how the structurally disadvantaged, including, for example, women or black and ethnic minorities, can overcome the substantial and particular barriers they face. While many of the proposals appealed to a generalized and broad beneficiary “public” (e.g. “public goods,” consumers, and the “economy,” etc.), future policy analysis should strongly scrutinize any policy proposal with

the question “for whom?” Proposals which set either vague or overly narrow targets, or, more importantly, that ignore or exclude marginalized and vulnerable stakeholders, should be identified and made familiar with ways in which to expand their horizon.

Do the policies attempt to build alliances across boundaries?

The organizations in this study largely reflect middle-class and (often) agricultural interests, with not one organization or author explicitly committed to the interests of particular marginalized groups (beyond a focus on small farmers or landworkers). In this respect, the food justice perspective has frequently challenged food activists and organizations to consider and check their own self-interests, which are often from a privileged vantage point, through allyship, decentering their own power, enabling the leadership of marginalized constituencies, and centering their priorities and perspectives. As we have seen, it is the most vulnerable in society, often living in urban areas, who will be most affected by problems in the food system, such as food access and deteriorating labor conditions. Nevertheless, the policy proposals in these documents rarely addressed this, and may even represent a moment of consolidation of an urban-rural divide in food and farming policy. Building on the work of advocates of a “common food policy” (as well as some documents featured in this analysis (PFP, Sustain, Eating Better), we argue that future policy processes must attempt to bridge this divide, not only for the interests of the least well off, but because of the strategic alliances this could help forge.

Do the policies address spatial and temporal injustices?

Very few of the documents considered interests, beneficiaries, and implications for food systems beyond national borders (including issues relating to migration). Moments of crises and change—such as Brexit—debated within a particular territory or country (e.g., national-level post-Brexit policy) can reinforce an inwards and protectionist posture that strengthens colonial relations and further shifts harm outside of national boundaries (e.g., shifting environmentally damaging production to the Global South while greening agriculture and im-

proving economic conditions for farmers in the UK). Many of the worst social and economic injustices of the food system arise through the continued exploitative relationship between the Global North and the Global South.

These discourses were further bounded by their focus on the short term. The documents, their arguments, and their analyses are almost entirely timeless: ahistorical analyses with almost no consideration of the past. What seems clear is that deeper-seated social justice issues related to historic trauma, the legacy of slavery, uneven patterns of land ownership, the historical plight and struggles of farm and food workers, and the colonial underpinnings of the food system are completely absent. Whereas the past traumas of slavery, colonization, and indigenous dispossession are, to a greater extent, active in debates on food and farming in North America, these issues are hardly visible in the debates on food and farming policy in the UK.

Does the policy process prefigure democratic participation?

The Brexit discourse was initiated in part around ideas of democracy and sovereignty. However, these debates have often appealed to extremely narrow concepts (as in the case of nationalism) or produced contradictory outcomes (i.e., instances where leaving the EU may result in even fewer chances to participate in processes that affect the UK). The reasons for this are complex; however, we argue here that practices of regular political participation must be mainstreamed to avoid ambient political disaffection being captured by narrow populism. *Democracy is difficult*, and, like any skill, practice is essential to improve performance. Some documents did, in fact, use the Brexit moment to enact or prefigure democratic participation on a small scale by establishing broad consultative processes (e.g., Eating Better and PFP). The wider practice of this type of participation will provide skills and cultural norms that can help push back against the status quo of elite control over policy discourse and policy-making. This type of democratic practice must be locally determined. However, it may follow tried and tested formats of community-run farms and food policy councils, as well as more emergent forms, such as people’s food policy processes, people’s

assemblies, citizen juries, and other deliberative processes.

Does the policy process create space for reflexive learning?

Our final dimension of reading for justice is cross-cutting. It concerns the idea of “reflexivity”—a practice of mindful awareness of one’s own relative power within society. Looking at and continually critiquing one’s own practices and politics is a fundamental but rare dimension of activism, sustainability, and policy-making. This principle arises as an obvious implication of the above—that much of “reading for social justice” will require a critique of oneself (and the organizations one is acting within). This will involve a process of learning and self-transformation by those who occupy these spaces and who are producing discourse as the basis for action towards food justice. Placing reflexivity in the context of transformative learning will also allow linkages with pre-figurative participatory democracy, which, as already stated, can be difficult to access or promote, especially for inexperienced participants. Constructing a deliberate intent to enact and signal policy-making as a gradual learning process, rather than a fixed and all-or-nothing endeavor, is essential. So defined, reflexivity will be critical to open up the horizon for, and the possibility of, the other four principles detailed above.

Conclusion

This paper provides the first analysis of the implications of food justice in policy discourse in the UK. The paper demonstrates the limited ability of the Brexit moment to generate policy advancements in the area of food justice. We have identified shortcomings in areas such as the framing of public goods, the consideration of food workers, and the opportunities for participation of marginalized groups. These limitations, it must be noted, are true of Brexit more generally, where an emergency logic is prevailing, displacing some of the purported objectives of political control and autonomy. With very few exceptions, the post-Brexit food policy discourse was shaped by a narrow conception of urgency—one bound by self-interest, dependent on elite knowledge, and involving negligible participation. The five-part framework we have offered in this paper provides an important

tool for incorporating social justice into policy positions and lifting the priorities and voices of the marginalized in policy-making discourse.

These findings resonate with the literature on food justice that demonstrates the ways in which social justice gets side-lined (Alkon & Norgaard, 2009; Cadieux & Slocum, 2015; Moragues-Faus, 2017; Sbicca, 2018) or framed in a way that neglects structural causes of injustice. Using the work of Fairclough (2010), we have sought to describe this neglect in terms of the “unsayable.” Though Fairclough describes public discourse as having the potential to open up “possible worlds,” what we have instead seen is largely an inability to say or speak about certain injustices, leaving food justice effectively *undoable*.

Expecting agricultural policymakers and contributors to consider the urban poor, farmworkers, disabled people, or adopt a decolonial view might appear quixotic. However, the analysis presented in this article demonstrates how constrained the discursive horizons of agricultural policy-making are at present. Prompting these actors who already have a platform in the discursive arena to decenter their own perspectives and interests is one important part of a process that will help shift debates towards food justice. However, one of the most important limiting factors in these arenas is participation—the voices of those most negatively affected by dynamics in food systems (especially food workers, migrant labor, and the urban and rural poor—recognizing that these are not homogeneous groups and that their experiences are differentiated through the intersections of race, class, gender, sexuality, age, ability, and more) are underrepresented in these processes. Few organizations in mainstream UK food and agricultural policy-making explicitly stand for such diverse groups or their needs, and until this is redressed, the possibilities for achieving any substantial version of food justice will remain unrealized.

Future research and policy could both focus on developing emerging tools of participatory policy-making processes capable of engaging with (and responding to) diverse experiences in society, such as citizens assemblies, citizen’s observatories, and collaborative policy platforms like PFP (Anderson, 2017). Imagine a process where, instead of the 20

policy documents presented and analyzed in this paper, an investment was made to engage with 20 groups of the most negatively affected and historically excluded voices in food and farming policy. In this case, the interests of such groups could be brought to bear on a food system that currently fails to meet their needs, yet continues despite the

excessive harms it causes. The lifting of excluded voices in the production of policy discourse is, of course, only one important step, but one that must be taken if we are to take the process of collective reimagining seriously and move to a system that places long-term human flourishing above short-term profit.

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Going rogue for raw milk: Experience and values as consumer filters for conflicting raw milk discourses

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Abstract

Consumption of raw milk has long been a hotly debated topic: government entities, medical professionals, and advocacy groups often present different reasons in support of or opposition to raw milk, creating a particularly difficult environment for consumers to navigate. Through semistructured interviews, this paper examines consumers in Vermont who have decided to consume raw milk, exploring their experiences with raw milk and their reasons in support of it. It was found that consumers of raw milk often prioritize personal experiences and local networks over scientific expertise when it comes to raw milk consumption. The process of conducting their own research about raw milk has also helped create a community of more conscious consumers. This case study ends with a set of suggestions that may be helpful for other communities. Specifically, we discuss

marketing strategies to promote raw milk, as well as risk communication strategies for regulators and public health officials seeking to minimize its consumption.

Keywords

Consumer Decision-Making, Dairy, Food Systems, Risk, Raw Milk, Unpasteurized

Introduction

Studies have shown that raw milk is much better than pasteurized milk for building strong bones and teeth, and for creating resistance to disease. Raw milk protects against allergies and asthma and often improves behavior in children.

(Weston A. Price Foundation, 2011, p. 22)

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Drinking raw milk is “like playing Russian roulette with your health.”

—*John Sheehan, Food and Drug Administration Division of Dairy and Egg Safety (quoted in Hannon, 2009, para. 4)*

Raw milk “provides a viable market niche for dairies.”

(National Farmers Union, 2013, p. 17)

Any foodborne illness outbreak related to dairy products damages consumer perception of milk in general, even when the source of the problem is clearly attributed to raw milk or raw milk products.

(American Farm Bureau, 2013, para. 6)

The debate over raw milk is polarizing, with parties speaking passionately both in support of and in opposition to its availability and consumption. Those on each side of the discussion make broad—and sometimes dire—knowledge claims regarding benefits and risks associated with raw milk consumption. As illustrated by the epigraphs above, advocacy groups, agricultural associations, and various governmental authorities all voice divergent opinions regarding raw milk safety and health benefits. Therefore, consumers navigate these contests of voices when deciding whether or not to drink raw milk.

In an instance of such contestation, the Vermont General Assembly voted in 2009 to allow dairy farmers to sell their unpasteurized product, against the recommendation of the federal government, which forbids interstate transport of raw milk and strongly recommends that states outlaw it (Sawyer, Calderwood, Bothfeld, & Perkins, 2010; Weisbecker, 2007). Vermont is now one of 38 states that allow raw milk sales in some capacity (Rhodes, Kuckler, McClelland, & Hamrick, 2019); advocates within the state cite consumer demand and high prices of raw milk as reasons for allowing farmers to sell it (Rural Vermont, 2019). A 2013 statewide survey found that 11.6 % of Vermonters had consumed raw milk in the past year (Leamy, Heiss, & Roche, 2014).

Voices of raw milk consumers themselves are often drowned out amid conflicting governmental

and advocacy group recommendations. Yet raw milk consumers are not simply passive recipients of governmental, advocacy, and media messaging—rather, they are consumers making decisions based on their research, experience, and values. More research is needed to understand how consumers who drink raw milk evaluate conflicting recommendations surrounding its consumption (Leamy et al., 2014).

In this study, we examine how raw milk consumers integrate widely varied health and risk discourses into personal consumption decisions. We argue that personal experiences, relationships, and values offer a lens through which consumers interpret and filter these contested voices and ultimately make personal consumption decisions. In examining how raw milk influences consumer decision-making processes, we contribute to the larger discussions regarding consumer behaviors amid health and safety debates regarding food, as well as those specific to raw milk.

Raw Milk in Vermont

As of 2011, 30 states allowed raw milk sales in some capacity. Although all 30 have stricter standards in place for raw milk sales than for pasteurized, these state policies allow access to a substance that the federal government says is categorically dangerous. Regulations vary widely by state, with some states allowing raw milk sales only from the farm, some enforcing stringent quality and testing standards, some allowing only raw goat milk sales, and two states—Kentucky and Rhode Island—allowing sales of raw milk only with a doctor’s prescription (National Association of State Departments of Agriculture, 2011).

Federal government policies are based on discourses that assert that raw milk is dangerous and forbid raw milk sales across state borders, while Vermont laws that permit on-farm raw milk sales are more permissive. When the General Assembly voted to permit limited sales of unpasteurized milk in Vermont (Sale of Unpasteurized Milk Act, 2009), the state became part of a small-scale reversal of the early 20th-century push for sanitization and standardization of the milk supply (NASDA, 2011). Pasteurization—heat treatment to kill bacteria—came into widespread practice in the U.S. be-

tween 1900 and 1940 along with a variety of other sanitary measures, most aimed at addressing urban disease epidemics that had been traced back to the rural milk supply (DuPuis, 2002). These measures, in turn, enabled greater production and distribution of dairy products. With state and local governments leading the charge to demand clean milk, pasteurization became nearly universal over 30 years, bringing an accompanying decline of food-borne illnesses such as typhoid and cholera (DuPuis, 2002). Producers and distributors favored the practice once they noted that pasteurized milk had a longer shelf life and thus could be distributed further (U.S. Food and Drug Administration, 2011).

Resistance to pasteurization in the early 1900s made up a small but vocal minority. Some of those voices are reflected in contemporary raw milk advocacy efforts, as well as in state policies regarding the sale of raw milk. The recent pushback against pasteurization has been spurred, in part, by groups arguing that raw milk benefits farmers, as they can sell it directly to consumers and at a higher cost, and that raw milk offers health benefits which pasteurized milk does not. For example, the Weston A. Price Foundation is a national organization that distributes information to consumers about the health benefits of raw milk and participates in national policy discussions about its legalization (Weston A. Price Foundation, 2000). Rural Vermont (2019) is a farmer advocacy group that has played a large role in policy discussions around loosening the state laws restricting raw milk sales.

In Vermont, producers may only sell fluid raw milk: they may not process it into yogurt, cheese, butter, or any other substance. Producers face strict limits on the total quantity of milk they are allowed to sell, and larger producers face strict bacterial testing requirements. Producers who sell raw milk must post a sign that states “This product has not been pasteurized and therefore may contain harmful bacteria that can cause illness particularly in children, the elderly and persons with weakened immune systems, and in pregnant women can cause illness, miscarriage or fetal death, or death of a newborn” (Sawyer et al., 2010, pp. 59-60). In this way, the state frames raw milk as a “risky” substance and reduces its own responsibility for any

illnesses caused by consumption.

Despite governmental cautions against raw milk consumption and limited, if any, research supporting the safe consumption of raw milk, a limited body of research suggests that some people are still choosing to consume raw milk. An American Time Use Survey—Eating and Health Module found that from 2014 to 2016 an estimated 3.2 million people each week consumed or served raw milk (Rhodes et al., 2019). In Vermont, the 2013 annual Vermonter poll found that 10.7 % of respondents said that they had consumed raw milk within the past year (Leamy et al., 2014). Though these consumers were generally aware of government discourses regarding the health risks of raw milk, they primarily cited flavor, health benefits, and acquaintance with their farmer as reasons that they choose to drink raw milk. A 2011 survey of 56 raw milk drinkers in Michigan found that only four respondents said that they “generally trusted recommendations made by state health officials regarding what foods are safe to eat” (Katafiasz & Bartlett, 2012, p. 125), demonstrating a general mistrust of governmental recommendations among raw milk drinkers.

Discourse and Food Risk

In a society that considers many forms of risk, consumers are faced with a plethora of discourses regarding the healthfulness and riskiness of foods. In this landscape, advice on eating choices, risks, and benefits may come from scientists and dietary professionals. However, it may also come from members of the media and the general public, as well as any number of advocacy or trade groups. Rahn, Gollust, and Tang (2017) describe how strongly debated policies such as raw milk regulation cause the public to receive mixed messages from various influences, such as advocacy organizations, interest groups, professional associations, and public officials, who try to sway the public toward their policy position. Further, Fuentes and Fuentes (2015) note that these differing opinions can create anxieties over food choices among consumers, due to their heightened awareness of possible risks and various means of responding to risks.

Shifting discourses on nutrition and health have thrust pasteurization—once hailed as the ulti-

mate way to mitigate dairy risk—into a newly contested space. In the early 20th century, municipal and state governments turned to pasteurization as a way to ensure a clean and disease-free milk supply for their population. While the switch to pasteurization was not nearly so monolithic a switch as it seems today, the prevailing discourse of dairy safety throughout the 20th century, however, has held that pasteurization is necessary for the safety of the milk supply (DuPuis, 2002). Certain advocates and scholars have problematized this discourse, driving the rise of what Paxson (2013) has termed “post-Pasteurian” beliefs, which question the push to rid bacteria from the food system. The post-Pasteurian view “emphasizes the potential for cooperation among agencies of nature and culture, microbes and humans” (p. 161). This idea has become widespread in the popular food press, including a *New York Times Magazine* cover story, “Some of My Best Friends Are Germs,” in which Michael Pollan (2013) discusses the so-called “good bacteria” that help the human body to function, noting that these bacteria may be supplemented and stimulated by vegetables and certain fermented and raw foods—like milk.

Many food and animal scientists, on the other hand, adopt what Paxson calls “Pasteurian” attitudes, citing the dangers and strongly opposing the practice of drinking raw milk. Donnelly and Pritchard (2010) stated that “despite claims of health benefits associated with raw milk consumption, raw milk is a well-documented source of bacterial pathogens which can cause human illness, and, in some instances, death” (p. 2). For example, reports cite “12 confirmed infections and five probable cases of *Campylobacter jejuni* infections identified in persons who consumed raw milk from a herdshare dairy in Colorado” between August and October 2016 (Burakoff et al., 2018, p. 148). In addition, a recent study that tested raw drinking milk in England found 59% of the samples to have safe bacteria within all parameters, and 1% contained bacteria considered potentially dangerous to health (Willis et al., 2017). Over the last two decades, bacterial pathogens have become stronger; particularly, since reducing the cost of health care is a high priority in both Vermont and the U.S., “increased raw milk exposure will only contribute to

the economic burden of increased health care costs due to [*E. coli* 0157:H7, which is associated with acute kidney failure in infants and which easily contaminates fresh milk] and other pathogens (Donnelly & Pritchard, 2010, p. 5).

In the U.S., the most severe cautions come from the FDA and the CDC. Although these authorities generally do not prioritize messages about the risk of foodborne illness over fostering a healthy microbiome of bacteria, the FDA raw milk informational page clearly states its concern regarding the public health costs of raw milk. It leads with “Is it safe to consume raw milk?” to which it bluntly responds, “No” (FDA, 2011). The FDA cites the CDC and the American Academy of Pediatrics as organizations that agree with its stance that unpasteurized milk is unsafe, citing *E. coli*, listeria, brucella, and salmonella as just some of the pathogens that occur in raw milk. As FDA official John Sheehan put it succinctly in an epigraph at the beginning of this paper, “It’s like playing Russian roulette with your health” (Hannon, 2009).

Enveloped in the contest of voices regarding health and risks, consumers can become frustrated with the lack of definitive answers about what to or not to eat. Östberg (2003) concluded that consumers experience “everyday anxiety due to the salience of food and health-related questions and the difficulties involved in finding pertinent answers to those questions” (p. 220). Paxson (2013) argued that “the contraindication of experiential knowledge may lead laypeople to dismiss the authoritative knowledge of scientific experts as overreaching or even beholden to industry interests” (p. 165). That is, consumer experiences may outweigh cautionary and scientific and governmental discourses. Enticott (2003) found that instead of accepting the health-based portrayal of raw milk risk, consumers whom he interviewed in a small town in England framed health as only one of a variety of important factors in their decision to drink raw milk. In the face of warnings about bacteria in milk, he noted, “consumers may over-ride them with concerns for their community and locality” (p. 413-414). Enticott’s interviewees were aware of presiding risk discourses, but chose other measures as the final arbiter of their behavior. Valchuis, Conner, Berlin, and Wang (2015) also cite that many

consumers prioritizing local food sources as an important factor in food purchasing. Although purchasing locally is important, consumers must be careful to weigh their options carefully to avoid the “local trap,” the tendency for consumers to associate “local” with desirable outcomes (Born & Purcell, 2006).

In the U.S., a limited body of research suggests that people are choosing to consume raw milk despite governmental warnings. In one of the few recent state surveys, a 1994 California study found that of 3,999 respondents, approximately 3.2 % had consumed raw milk in the past year (Headrick, Timbo, Klontz, & Werner, 1997). A 2011 Michigan study that surveyed only raw milk drinkers found a great deal of mistrust of government recommendations among the 56 people interviewed: only four respondents said they “generally trusted recommendations made by state health officials regarding what foods are safe to eat” (Katafiasz & Bartlett, 2012, p. 125). Both Michigan and California have raw milk regulatory structures and overall population demographics that are very different from Vermont, however.

More recently, Leamy et al. (2014) found that in 2013, 11.6 % of Vermont consumers had obtained raw milk within the past year. The survey, representative of the state population, found that the majority of raw milk drinkers lived in rural areas, and that the average raw milk drinker was middle-aged and had a bachelor’s degree or higher. It was also found that raw milk drinkers get information about raw milk primarily through farmers and personal networks. Since the study consisted of a brief phone survey, the authors called for further research into how consumers evaluate information they receive about raw milk and how they “make sense of divergent recommendations regarding raw milk” (p. 224).

Our research seeks to fill that gap, drawing on the voices of raw milk consumers to examine how consumers evaluate information they receive about raw milk and how they make sense of those external recommendations and their own experiences. Specifically, we asked, How do consumers make decisions regarding their personal raw milk consumption amid conflicting discourses surrounding raw milk consumption, health, and risk?

Methods

Interview Data Collection

The snowball technique (Polkinghorne, 2005) was used to identify a “pool of possible participants” (p. 141). We reached 25 people who regularly purchase and drink raw milk and who were willing to participate in an approximately 45-minute-long, one-on-one interview. We selected raw milk drinkers only within Vermont in order to maintain consistency in our discussions of state-specific raw milk policies. We recorded the audio of each interview.

A semistructured interview format was used. The team worked together to develop a set of interview questions about consumption behaviors and knowledge of public discourses surrounding raw milk. The semistructured format allowed the research team to have consistency across interviews while also allowing for some “freedom to digress” (Berg, 2004). The research team talked weekly about their interviews to ensure that researchers were asking about similar topics and digressing from the interview protocol in similar ways.

Characteristics of the Interview Study Population

Out of the 25 interviewees, 20 were female and 5 were male. Two did not respond to our initial data collection survey. Of the survey respondents, nine had a bachelor’s or associate’s degree, and 14 had a master’s or doctorate. Eight had a household income of \$50,000 or less per year, while 15 had a household income of more than \$50,000 per year; one did not answer. All interviewees were regular raw milk drinkers, consuming at least one glass of raw milk per month. Thirteen said they drank more than eight glasses of raw milk per month. Nineteen reported also consuming pasteurized milk within the last year.

Interview Data Analysis

For the analysis, we entered the interview text into HyperRESEARCH (ResearchWare, 2012) qualitative research software in order to code the data for emergent themes and patterns. At this point, we assigned pseudonyms to each interviewee.

We developed our aims and research focus using a “constant comparative” process (Glaser &

Straus, 1967), in which various parts of the research process happen simultaneously, guided by constant examination and comparison of the data to reveal recurring themes. In its most common form, “categories, properties, and dimensions as well as different parts of the data are constantly compared with all other parts of the data to explore variations, similarities and differences in data” (Hallberg, 2006, p. 143).

Our process followed that of inductive thematic analysis, in which the research has “a descriptive and exploratory orientation” (Guest, MacQueen, & Namey, 2012, p. 7) as opposed to a process “guided by specific ideas or hypotheses the researcher wants to assess” (p. 8). The recurring themes that emerged through background reading and interview coding formed the structure for our analysis.

Analysis

We argue that while consumers were aware of multiple raw milk discourses, they believed that the information regarding raw milk, health, and risks often conflicted. Instead of relying on the risk and health discourses surrounding raw milk consumption, interviewees relied on the filters of personal experience and personal networks to create decision-making criteria regarding raw milk.

In this section, we examine how interviewees make decisions about their personal raw milk consumption amid conflicting discourses surrounding raw milk consumption, health, and risk. First, we describe how interviewees interpreted tensions between cultural raw milk discourses. Then we discuss the ways in which interviewees applied their own experiences and observations in order to draw their own conclusions about raw milk.

A Contest of Voices

Interviewees identified a range of competing governmental, scientific, and advocacy discourses that presented raw milk as anything from a high-risk and dangerous substance to a healthy and beneficial beverage. Almost all had done extensive research as part of their decision to drink raw milk. Interviewees generally recognized various opinions and opposing recommendations surrounding raw milk, health, and risk in mediated sources. Many

brought literature and sources to interviews, including internet sources, books, videos, educational events, and official publications. This information generally separated into three perspectives on raw milk consumption: federal, state, and advocacy.

Federal regulation

Interviewees tended to have strong opinions regarding prohibitive federal discourses on raw milk consumption. While interviewees had various perspectives on the need for these prohibitions on a national scale, none felt that this discourse applied directly to their own consumption habits. Walter stated that federal discourses on the health risks of raw milk are completely wrong: “I have people that I trust who I think are on the right side of the issue, and I totally ignore what the government says because they have no credibility. I do my own research.” He felt that political and lobbying forces influenced governmental restrictions on raw milk and that the federal government was not a trustworthy source of information on the probability of risk.

Sibyl had similar skepticism of federal warnings, but she moderated her statements by considering scale as a factor in milk safety:

People get sick from drinking pasteurized milk, too, you know. There are issues, and I think that a lot of it comes down to scale and size and operation of farm and that kind of thing. And, so I think just blanketly saying that you shouldn't drink raw milk kind of misses the whole point.

Sibyl, like Walter, did not feel that federal representations of risk were relevant to her, but she suggested that there were certain scenarios where federal regulations would be applicable. To her, the scale of milk production changed the probability of risk, and raw milk from a smaller farm presented a very small amount of risk. While she acknowledged that there were instances when raw milk might be risky to consume, Sibyl used scale as a criterion to filter the federal risk discourse.

Kate, too, was skeptical of the federal risk discourse, but noted that she understood why these recommendations were in place. Of pasteurized

milk from the grocery store shelf, she said, “I know that it’s been in so many places and done so much traveling through so many hands and so much equipment.” To Kate, this meant that the national milk supply was potentially unsafe, so pasteurization within this type of system made sense. Yet she understood these cautions to be primarily relevant within one type of agricultural system, whereas she felt that different rules applied within the Vermont system: “In my particular case, I have the luxury to ignore their recommendation because I feel like for me, where we live, I have another option.” Kate concluded that her own purchases at a small Vermont farm fell outside the large-scale system to which federal risk discourses applied. She filtered those risk discourses through a systemic lens and concluded that her own raw milk consumption required different risk considerations than a purchase of milk at the grocery store.

Vermont regulation

There was a significant amount of variance in how familiar participants reported being with the Vermont state regulations of raw milk. Many interviewees said that they did not know the Vermont regulations allowing consumption of raw milk well. For example, Maggie said, “I know it changed a few years ago, so to now allow raw milk sales on farm. Actually, I don’t know what it was before, if it was considered illegal . . . and now—now it isn’t.” When asked about Vermont’s raw milk regulations, Holly said “I don’t know—I mean I’ve never really, like, read a list of rules or regulations.” Even when other interviewees expressed a vague familiarity with the state’s regulation of the product, they relied heavily on access to the product as an indicator of its legality. For example, Walter said, know, “I don’t really even know the laws here in Vermont, I just knew that raw milk was available if you went to the farm.” Similarly, Barbara said “I don’t know the ins and outs of the policies. I know that [farmer name] cannot advertise her milk. She can only sell a certain amount a day. And that’s about what I know for Vermont.” Walter and Barbara trusted the accessibility of raw milk sales as an indicator that Vermont policy permitted raw milk consumption and sales.

While some participants based their under-

standing of Vermont policy on accessibility of raw milk, some participants felt very well informed. Sibyl explained that “we’ve watched the evolution of the law creating more opportunities for that [raw milk consumption].” Sibyl explained that she paid attention to state regulations because providing her family with raw milk to consume was important to her. When describing their knowledge of Vermont state policy, participants commonly referred to their understanding of other state-level policies governing raw milk. Describing Vermont raw milk regulation, Hannah said, “[Vermont] got the law . . . they can sell a higher quantity per day off the farm, but they still can’t sell it in stores. Now in New Hampshire and California and some other places, you can actually sell raw milk in stores.” Kate similarly compared Vermont policy to California, “where raw milk is—can be sold in stores.” Kenny said, “in North Carolina, which has a slightly different food and agricultural culture, raw milk sellers are still legal down there.” By understanding multiple state policies, these interviewees were able to understand the evolution of Vermont regulations.

In general, interviewees felt that Vermont laws regarding raw milk were more in accordance with their own beliefs about risk. Shannon said that she felt state regulations allowed her the leeway she wanted in her decisions to drink raw milk: “I don’t really see [my decisions] as pushing back against Vermont’s policies, because Vermont’s policies are not so strict that I have to circumvent or go around them.” Shannon was in compliance with Vermont laws in her raw milk consumption. Her words, however, implied that even if state policies forbade the consumption of raw milk, she would still “circumvent” those policies in order to drink it.

Interviewees voiced support for state laws for the most part; however, there were interviewees who felt that Vermont policies were restricting their behavior. Purchasing behaviors were particularly salient. Bridget explained that she and other raw milk advocates challenge Vermont’s policies “cause our state does not allow the sale of raw milk in commercial locations. It has to be directly through the farmer and directly from the farmer.” When explaining her desire to see Vermont regula-

tions change, Sibyl explained, “I’ve spent some time in Maine and, like, you can walk into the grocery store in Maine and buy raw milk.” For Bridget and Sibyl, the difficulty of consumer access was a source of frustration. Walter was also concerned by Vermont regulations that restricted sales. He explained, “the problem is that very few places are like Vermont and like this area where you can have access to it. It’s—it’s against the law just to ship it across state lines and most states have laws against selling it, so it’s really unfortunate.” Walter was frustrated that consumers outside Vermont could not easily access Vermont raw milk and upset about the restricted market for Vermont farmers. Walter said he believed “the government should not place any obstacles in the way of consumers who want raw milk.”

Another frustration among Vermont raw milk consumers were laws that forbid on-farm sales of anything other than unprocessed fluid milk, including skim milk, cream, raw milk cheeses, and yogurt. Those who expressed this frustration felt the requirement was needlessly restrictive. Many said they prepared their own products with the raw milk. For example, Holly said, “I don’t know how often I participate in civil disobedience. But this is an act where I’m proud to, you know, make my own raw milk products off the farm and consume them, which it’s still like a gray legal area at this point.” This participant perceived their consumption of raw milk and cooking with raw milk to be a questionable act within state law, yet they took pride in pushing the legality of their actions.

In addition to feeling restricted in consumption practices, some participants expressed a level of frustration regarding consumers’ ability to make informed and free choices about raw milk consumption. Jon explained that, “it’s great that you can sell it here at all, but I just think that that giant white sign that says this will kill your baby is a little confusing.” Though Jon consumed raw milk, he expressed that the point-of-sale risk messages, even in a state that permits the sale of raw milk, were likely confusing to some audiences. Hannah also believed that it was difficult for consumers to make informed and free choices about raw milk consumption. She explained, “I don’t think the average consumer is as well informed as they could be. It’s

definitely a jumbled up mess at this point. But I think it’s really good that we have those options [to buy and sell raw milk, as well as educate consumers].”

Bridget situated consumer confusion within a tension between state and federal messages. She said that, “it’s really on us [the consumer] to make our own decisions, and to make them wisely and make them well.” However, she explained that making wise decisions about raw milk consumption can be difficult because federal discourses “often discourage raw milk drinking as a way of promoting public health, [which] ignores the fact that raw milk has some public benefits.” She believed that federal agencies “are unwilling to give a more subtle message to the public,” while “the public is capable of understanding a subtle milk—a subtle message.”

Vermont’s laws permitting the sale and consumption of raw milk honored the public’s ability to make sense of “subtle messages” about risk, yet may be confusing to consumers since the federal discourses are so frightening. The discrepancy between federal recommendations and Vermont laws muddied the definition of “official” health and risk recommendations and institutionalized directly conflicting advice.

Medical advice

Official discourses are not exclusively within the legal or political system; however, interviewees noted that health practitioners often echo the federal risk discourses regarding raw milk. Some interviewees noted that they had had difficulties finding doctors who were permissive of their raw milk habits, particularly during pregnancy. Holly, who felt that drinking raw milk kept her healthy, wanted to continue drinking it throughout her pregnancy and took this into consideration while searching for a doctor. “We sort of gravitated towards healthcare providers that said, ‘We have to tell you that you shouldn’t, but we also support you doing what you feel is right.’” Olivia, on the other hand, chose not to tell her doctor that she consumed raw milk while pregnant: “I go to a fairly progressive doctor. I don’t think they would have an issue with it, or maybe they would ... but I didn’t talk to them about it.” Both Holly and Olivia chose to consume

raw milk because they believed it was the healthiest option for them, rather than accepting what the probabilistic risk discourse of the medical establishment said would keep them healthiest.

Advocacy literature

Beyond regulatory and medical advice on raw milk, interviewees gathered much of their information from a variety of sources, including books and other publications, videos, educational lectures, and the internet. The most prominent sources that interviewees discussed were advocate voices such as Rural Vermont and the Weston A. Price Foundation, which both offer information regarding raw milk on their websites. The Weston A. Price Foundation, founded in 1999, is dedicated to spreading the nutritional theories of Dr. Weston A. Price, an Ohio dentist who practiced in the late 1800s and early 1900s and theorized that nutrient-rich diets like those consumed in pre-industrial societies are the healthiest diets (Weston A. Price Foundation, 2011). As an international organization, the Foundation has a great deal of information available to the general public, including founder Sally Fallon Morell's cookbook *Nourishing Traditions*, several documentaries and books, the website <https://realmilk.com>, and public lectures, such as Morell's talk in Burlington in June 2012. Interviewees referred to the Weston A. Price Foundation, which advocates nationally for raw milk access and consumption, as a "really good source of information" (Hannah), and described it as "the biggest proponent of raw milk" (Maggie). In nearly all interviews, the foundation and its work came up either directly or indirectly. Many perceived its website and publications to be the most complete resource on raw milk available on the internet, citing information from the foundation as a rebuttal to federal risk discourses.

Circumventing the contest of voices

Interviewees expressed frustration with the divergent raw milk discourses they found. They cited a variety of alternative voices, but many also acknowledged that conflicting, shifting voices were overwhelming and made it difficult to decide one way or the other about raw milk consumption. Consumers turned instead to personal filters, in-

cluding personal experience and community networks, to vet their decision to drink raw milk.

Trust yourself

While Jon had explored a variety of mediated discourses on raw milk, he felt the claims made by federal and state agencies did not line up with his own experiences:

I've gone on the FDA website, and even though I've been drinking raw milk for five or more years, it still kind of scares the shit out of you when they say, "You should never drink this under any conditions. It's a poison." But that's just not my experience. I've never gotten ill from drinking raw milk, and I don't know anybody that has.

To Jon and other interviewees, the severe risk discourses promoted by the federal government simply did not resemble what he saw of raw milk consumption. While he acknowledged that certain sicknesses were connected to raw milk consumption, nevertheless these anecdotes did not cause him to change his behavior.

Kate was aware of the potential risks of drinking raw milk, yet she was a regular drinker. She described a friend who held many of the same values that she did, but refused to drink raw milk:

We're very similar in terms of our food and health decisions, making food decisions more from an ecological perspective...with the exception of raw milk because her grandfather's brother died, it is believed, from raw milk. She says..."Having that in the back of my mind just does not allow me to pour a glass of milk for my child."

Kate noted that if, like her friend, she had known someone who had died or gotten seriously ill from raw milk, she might feel that it carried more risk. But her lack of any direct personal experience with raw milk's negative effects allowed her to choose to drink it and to feed raw milk to her daughter. Raw milk aligns with her ecological values, she enjoys the health benefits, and she has no personal experience to convince her that it is un-

safe, so she chooses to drink raw milk. In so doing, she is making her decision based on a variety of factors she felt were important, contrary to the risk-based decision that dominant discourses would advocate.

Trust your farmer

Beyond personal experience, consumers also looked to the producer from whom they got their milk for guidance on purchasing and consuming raw milk. Since most farms in Vermont must sell it directly from the farm, part of the experience of raw milk consumption is interaction with the farmer. All the interviewees had relationships with the farmers, and many knew friends or acquaintances who purchased milk from the same farm. Pauline and her family have a strong personal connection to the raw milk they consume: her husband picks it up for her family along his milk truck-driving route and counts many of those farmers among his friends. She noted the value of his interactions with the farmers producing the milk: "A lot of our friends are farmers. My husband was a farmer for 20 years. . . . So where else can you go to but directly to the source?" To Pauline, knowing a farmer and being closely acquainted with his or her practices was important as a way to determine from which farm to get her milk.

In visiting farms or receiving milk shares, interviewees regularly interacted with the farmers and valued those interactions over a supermarket-type experience. When Matt was looking for a place to buy raw milk, he chose a farm with overwhelmingly positive recommendations, both in person and online. The first time he purchased it, he went to the unoccupied farm store, took some milk and left too much money. Within minutes, he received a call asking him to come back to the farm and retrieve his change or take more milk. "I hadn't seen anybody, but there's no disconnect between the farmer and the consumer." He contrasted this experience with a supermarket transaction in which the service might have been less personal. Holly reported a similar feeling about the farm stand where she purchases milk by dropping money into a box and taking her milk. "They're trusting . . . that people are going to do the right thing. I think that goes both ways. The farmer needs to trust the con-

sumer, and the consumer needs to know and trust that the farmer's doing the right thing." Personal relationships and the trust that interviewees felt for their farmers figured prominently into their understandings of their consumption choices. Their interpretation of trustworthy raw milk hinged on personal bonds and experiences rather than on interpretation of risk.

Trust arose as a key variable even when the raw milk did not meet expected standards. Barbara noted that on a couple of occasions, her neighbor's milk "has almost seemed like it was soapy." On those occasions, she called her neighbor to report the taste, and her neighbor explained that milk from cows nearing the end of their lactation phase tastes different and contains different bacteria that give it an off flavor. "And so on both occasions, she's apologized profusely, giving me more milk, and actually finished drying off that cow." Yet Barbara said these two experiences never made her reconsider patronizing her neighbor's farm for milk. "I guess maybe it's because of the neighbor factor, the fact that we know her, that we trust her, and that we know she runs a very clean shop, that we're going to continue to buy milk from her." For Barbara, the farmer's accountability and honesty added to her personal loyalty and trust in the farmer, which in turn kept her on as a customer.

Trust local farms

Interviewees trusted not only farmers but the transparency of the production and distribution system the farmers ran. They could go to the farm and watch every step, from the cow to the bottle. This system allowed interviewees to keep an eye on the aspects of the farm business that they prioritized. "At least when I'm buying [raw] local, organic milk from people I know, I know exactly how they're raising the cows. I know exactly what their on-farm practices are. I know exactly how they use their profits," Bridget said. The topic of animal treatment came up in multiple interviews, and Eliza voiced support not only for the farmer she purchased her milk from but also for the cows: "I like having that relationship and knowing that the cows are being treated well." Jessie took an economic approach, emphasizing the impact of her dollars on the individuals within the system: "I'm

paying them directly . . . That's keeping our money here, and it's supporting someone that lives in [town], and they're going to hopefully spend that money elsewhere." To Jessie, purchasing raw milk directly allowed her to see not only where her food was coming from, but also where the money she paid for it was going. Many interviewees said they chose to drink raw milk in support of their local food system or economy.

This did not mean, however, that risk of illness did not play a role in consumer decision-making. Within the framework of local raw milk choices, risk avoidance emerged as one criterion for selecting which farm to support. Many noted that they had sought information on bacteria counts and dairy management practices before settling on a farm to patronize. Farms that sell raw milk to consumers in Vermont must post bacteria testing results publicly, and many said that their farmers offered more information on their operation and on raw milk in general at the farm stand. Pauline, whose husband drives a milk truck, said her family specifically chose farms to patronize based on the ones with the lowest bacteria counts. Juliana said, "The reason I trust [the farm where I buy raw milk] so much is because the owner has a degree in cellular biology. She's a scientist, and so I feel pretty confident that she understands how it all works and the importance of testing." Juliana had examined the information available, and she also felt that the farmer's background helped to maintain a clean and safe operation.

In fact, many interviewees said that due to the large number of steps between farm and supermarket shelves, pasteurized milk products actually presented the greater risk, and raw milk presented a means to mitigate that risk. Sibyl said, "I think that there's always risks in eating food that you haven't grown, so for me knowing as much of the food chain and value chain in between me and the farm is really important." To her, transparency was the best way to mitigate the constant risk of consumption. Interviewees most valued, and perceived the least risk in, the raw milk supply chain because they could see both where their food was coming from and where their money was going. Where federal governmental discourses advocate for pasteurization as a means to minimize risk, our interviewees

conceptualized a value system in which knowing the source and the process through which the food arrived on their plate was the most important factor in minimizing the risks involved in eating.

Discussion

Our aim with this paper is primarily to bring attention to a group whose voice has been relatively quiet in the scholarly discussion surrounding raw milk: the consumers. We discovered that interviewees did not conceive of their decisions as being in direct opposition to or in support of particular raw milk discourses. Rather than relying on or making sense of the contest of raw milk voices, interviewees relied on the filters of personal experience and personal networks to create decision-making criteria regarding raw milk.

Both national and Vermont-based numbers suggest that a small but not insignificant minority chooses to drink raw milk, particularly in states that have created a legal way to obtain the substance. Yet the limited existing research on the topic tends to frame these consumers as aberrant. For example, Katafiasz and Bartlett (2012) noted that although consumers interviewed claimed that raw milk had health benefits, "there is little scientific evidence to support the beliefs regarding raw milk's health benefits" (p. 126). Much of the U.S. scholarly research focuses on animal science, health, and safety and quantitative consumption perspectives on raw milk. In contrast, very little research delves into consumer understandings of raw milk consumption, including *why* people choose to disregard recommendations that governmental sources frame as highly important. Our interviewees regularly consumed raw milk, most stating that they did not feel they were partaking in risky behavior. Rather, they drew on personal experiences and local networks to develop priorities that reflected their belief systems and concepts of community.

Theoretical Implications

Sociocultural risk theorists might theorize that raw milk consumers are seeking ways to offset a risk that they feel modernity and mechanization—in this case, pasteurization—have created. Beck (1992) would posit that the turn to unpasteurized

milk is a reaction to new technologies that serve as “solutions to problems, but also as a cause of problems” (p. 156). Others, like Giddens (1991), would look to the conflicting authority voices arguing over risk, the voices that are speaking directly to raw milk consumers.

Some interviewees did express mistrust or frustration with pasteurization and its impact on their health, the taste of the milk, or the structure of the food system. As Giddens (1991) would suggest, many, too, were aware of the conflicting voices arguing for and against pasteurization of milk. However, unlike Beck or Giddens’s theorizing, we found that the discussion was not based solely around a preoccupation with risk. While consumers were aware of conflicting risk discourses and governmental warnings, their decisions were not driven by those discourses. Most interviewees acknowledged that there was food risk associated with raw milk, but they also saw risks associated with other types of consumption. Their strongest convictions about raw milk came not from mediated sources or risk discourses, but from the personal, face-to-face experiences that they had with farmers and other citizens in their communities. Among the many priorities interviewees balanced to make consumption decisions, risk did not figure heavily.

It is important to note that our interviewees were not drinking raw milk due to a deficit of knowledge about its potential benefits or risks. Rather, they were knowledgeable of the positive and negative consequences. They used a different set of criteria to make their consumption decisions. As such, our interviewees could be considered conscious consumers (Brooker, 1976). DuPuis (2000) describes this intentional consumption as a form of politics, particularly with regards to the milk industry. Conscious consumers recognize the agency they have to make food decisions within given communication contexts. They are not always going to choose what is considered the “healthiest” food. These consumers can identify, analyze, and evaluate competing messages before making consumption decisions using their own criteria. Future scholarship should investigate methods for helping consumers develop the skills needed to be conscious consumers.

Practical Implications

The paper examines the controversial area of informed consumer decision-making, which results in a choice of a food considered hazardous by the FDA. Our findings suggest that rural Vermont communities influence raw milk consumption decisions because of the close connection to producers of raw milk. These findings have implications for risk communication and regulators.

Local Food, Culture, and Risk Values

In many ways, the raw milk movement in Vermont has echoed a statewide rise in support for local food production. State agencies collaborated to write Vermont’s Farm to Plate Strategic Plan, which sets goals for localizing agricultural production, in 2009, the same year that the legislature voted to allow on-farm raw milk sales (Vermont Sustainable Jobs Fund, 2009). Vermont’s many farm-to-plate restaurants, and the highest number of farmers markets, farm stands, and community supported agriculture (CSA) farms per capita in the U.S., also highlight a push to localize agricultural production, distribution, and sales (Vermont Agency of Agriculture Food and Markets, 2014).

This study demonstrates how food and its consumption is a cultural practice that can supersede risk-society values. Organizations that promote raw milk consumption can draw on these cultural values of community and localization when marketing raw milk products. Also, our research demonstrates that conversations with producers have a strong appeal to raw milk drinkers. Effective marketing strategies for raw milk should be explored in more depth.

Risk communication and regulators

Although interviewees were not making their consumption decisions based on risk and safety, risk remains the primary form of communication for governmental authorities hoping to discourage raw milk consumption. State regulations in Vermont permit consumption of raw milk, yet public health and governmental warnings remain severe, such as the sign that must be placed where producers sell raw milk. This results in a portion of the population that willingly disregards governmental warnings and advice and thus receives no further

guidance for vetting the safety of a raw milk source. In Vermont, some 11.6 % of people have ignored those recommendations and received advice through alternative and personal communication channels (Leamy et al., 2014).

This is not to say that these public health warnings do not serve a purpose. Public health warnings are intended to keep the maximum number of people as safe as possible and limit government and producer liability if consumers do get sick. However, in this case, more than one-tenth of Vermont's population did not heed the advice of state and federal health recommendations (Leamy et al., 2014) and are left on their own to determine what is "safe" consumption of raw milk.

Improving risk communication

Our findings are valuable for public health and governmental agencies because they demonstrate the filters that raw milk consumers are using to make decisions regarding raw milk. Public health agencies can use our findings to craft future messages and methods of dissemination. For example, our findings suggest that raw milk consumers use relationships and conversations with farmers as key determinants in their decision to drink raw milk. It may be effective to educate farmers about ways to talk to consumers about risks associated with raw milk. Effectively communicating risks with raw milk drinkers needs to be explored in more depth.

Future Research and Limitations


We complicate the notion that consumers are simply flouting risk recommendations, instead revealing that interviewees are making informed decisions based on information that is not specifically risk-related, primarily through personal experience and community networks. It would be valuable for future research to determine if raw milk drinkers in locations outside Vermont are making their decisions using similar criteria.

The scope of the current study was limited to current raw milk drinkers, eliminating the perspec-

tive of those who consciously choose not to or to discontinue drinking raw milk. These consumers are also making consumption decisions within a contest of discourses. It would be valuable for future research to examine how consumers who have consciously elected not to or to discontinue consuming raw milk make this decision amid conflicting discourses surrounding raw milk consumption, health, and risk. Do these consumers engage with the contest of voices differently? Do these consumers rely on discourses and/or personal filters to make their decisions against consuming raw milk?

Additionally, Vermont raw milk consumers operate under the permits and restrictions of state-specific laws, and further research could examine how state regulations affect consumer relationships with farm, farmer, and product. For example, Leamy et al. (2014) found that the most common trait of raw milk consumers was living in a rural area; many of our interviewees also live in rural areas, but as Vermont urban areas are fairly small, most of those who lived in urban areas also routinely traveled to the farm where they purchased raw milk. Further research could investigate how consumer rationales for purchasing and consuming raw milk differ in states where fewer raw milk consumers have relationships with the farmers; for example, in California inspected raw milk is available for sale in stores (California Department of Public Health, 2014).

Concluding Thoughts

We should not assume that all eaters opt into the culture of risk-society anxieties. Consumers can make very informed, conscious decisions that are considered risky by dominant health and governmental organizations. Raw milk consumption behaviors are not uninformed decisions. Based on our research, we believe consumers value raw milk because they place a premium on the symbolic and practical impacts of their consumer decisions within the Vermont food system. 

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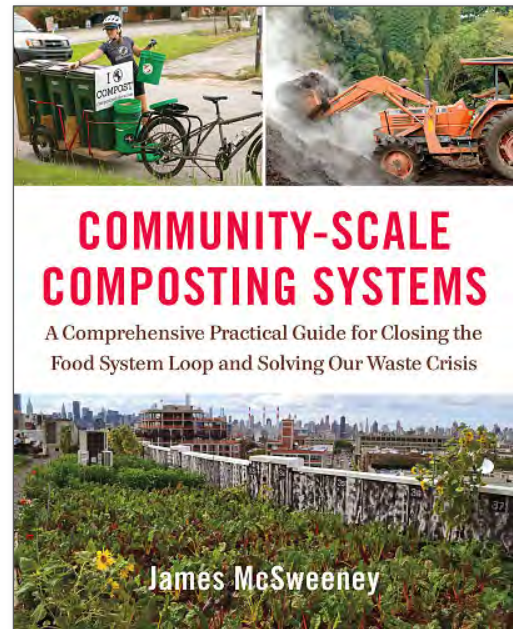
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Everything you ever wanted to know (or didn't know you wanted to know) about community compost!

Review by Malory Foster, University of Florida/Institute of Food and Agricultural Sciences (IFAS) Extension *

Review of *Community-Scale Composting Systems: A Comprehensive Practical Guide for Closing the Food System Loop and Solving Our Waste Crisis*, by James McSweeney. (2019). Chelsea Green Publishing. Available in hardcover; 464 pages. Publisher's website: <https://www.chelseagreen.com/product/community-scale-composting-systems/>



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What once may have been an underground movement to save organic materials from the waste stream, community composting is now celebrated and further empowered by James

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McSweeney's technical guide *Community-Scale Composting Systems: A Comprehensive Practical Guide for Closing the Food Systems Loop and Solving Our Waste Crisis*. The book meticulously unpacks this major challenge facing the food system in the U.S.—nothing short of a food waste crisis—and how to scale up in order to solve it. From the neighborly grassroots level to the budding entrepreneur, this tome feeds the budding “rotstar” on every scale—from backyard composting to organic waste hauling. There's just something about composting for everyone. As McSweeney notes in the introduction, “Composting calls, it speaks from the beyond, drawing in believers. . . . A large number maintain a deep belief in composting as part of a holistic way

of life” (p. 5). His new book is a well-researched, intricate foray into the world of community composting.

In looking at creating holistic local food systems, food production is no easy task; however, growing food is often not the bottleneck. For locales working with sandy or clay soils or in urban corridors, closing the nutrient cycle is a real challenge—as well as an opportunity for sustainable soil remediation, increased organic matter in soil, and decreased landfill volume (Magdoff & van Es, 2010). Expanding on the more established movement for backyard composting, community composting adds a social element, enterprise, and capacity-building to the growing practice of food scrap recycling. McSweeney outlines the 10 common models of community composting and goes into great detail describing the management of each type.

This book is for anyone who is venturing into the world of composting entrepreneurship or organized community composting. McSweeney’s attention to detail in walking out the steps for various scales of community compost makes this book a great reference for someone who is inspired to start a community composting business. While full of information and serving as a technical guide, McSweeney leads the reader through how to use the book, all the while painting a systems perspective. This 450-page volume is a reference for all scales of community composters, from backyard collectors to large scale compost entrepreneurs. Because of the breadth covered, not all the information included is relevant to everyone’s dream compost project, but the broad scope will help readers assess their resources and determine their niche. The book is an excellent reference for those in the planning stage of a composting project.

From a whole systems perspective, McSweeney begins by explaining the community composting world from food scraps generation, to hauling, to organics recycling, to end compost users. He endorses the term “food scraps” as the industry term rather than “food waste,” as is commonly used, to “begin transitioning from a waste paradigm to a resource paradigm” (p. 5). To achieve widespread implementation, community composting needs a variety of scales, which the author explores particu-

larly for organics recycling, including on-farm, community gardens, schools and institutions, worker cooperatives, demonstration and training sites, and food scrap collection services. The core steps remain the same: compost is generated, collected, composted, and applied for end use.


McSweeney discusses compost recipes and addresses the critical areas of compost management: aeration, agitation, containment, and reaching optimal temperatures through several phases of finishing compost at various scales. These are the keys to creating safe compost. Chapter four dives into more detail on ingredients, “feedstocks,” for compost recipes. An issue in some communities is the concern that composters inadvertently may produce methane because they do not adequately aerate piles or use enough carbon. The resulting “slime pit” becomes anaerobic and can produce methane. As it is presented in *Drawdown* by Paul Hawken, composting can be a powerful tool to sequester carbon instead of producing greenhouse gases. The focus of *Community-Scale Composting Systems’* recipe chapter is to explore appropriate compost recipes and procedures for a successful business and a high-quality product; however, quality compost also ensures the best results for climate change mitigation strategies. This chapter will help composters balance and blend locally available feedstocks, including considerations related to the carbon-to-nitrogen ratio and moisture, through more advanced considerations like bulk density, porosity, available carbon, pH, salts, organic matter, feedstock age, and the many qualities of various feedstocks in recipe development.

McSweeney presents an exciting although theoretical framework for carbon-negative food products by substituting conventional feed with food scraps, but acknowledges that more research is necessary on this topic. A chapter on integrating livestock and composting is especially helpful for those compost operators who are interested in increasing agrobiodiversity and on-farm ecosystems services where the genetic diversity of crops and livestock improves overall farm efficiency (Kremen & Miles, 2012). As a steward of backyard poultry, I was very curious about how to reduce the need for purchasing outside food sources for my hens. Included in the “Composting with Animals” chapter

is a sidebar by Tom Gilbert of Black Dirt Farm on “feeding community food scraps to laying hens in an active composting system.” This section provided good news to those hoping to decrease their laying hen feed costs as well as diversify their hens’ feed and create a nutritionally superior diet “by mimicking the ecological systems of a forest floor (a decomposer system)” (p. 298).

As throughout the book, McSweeney outlines various scales of collecting and hauling compost, from bike transport to multistream collection. Bike-powered composting is a growing trend, so much so that the Institute for Local Self Reliance recently published a report in which they interviewed 17 bike-powered compost companies in 10 states on strategies for entrepreneurs interested in starting this type of business. Qualities that made a bike transport business more viable were denser

pick-up areas, familiarity with the neighborhoods, and understanding local trash collection and tipping fees (Streeter & Platt, 2017). *Community-Scale Composting Systems* describes, impressively, that bike haulers can move up to ten tons per load (p. 14)!

This book is an excellent resource for libraries, community hubs, and learning spaces. It provides detailed information on composter operations, management, and determining end markets for entrepreneurs and larger-scale community composters. For more casual readers, like the backyard composter or very small-scale community composter, it would be a useful reference to check out from a local library or borrow from a friend. *Community-Scale Composting Systems* is a thorough reference on the many scales and designs for community compost operations and brings the community composting movement to the next level. 

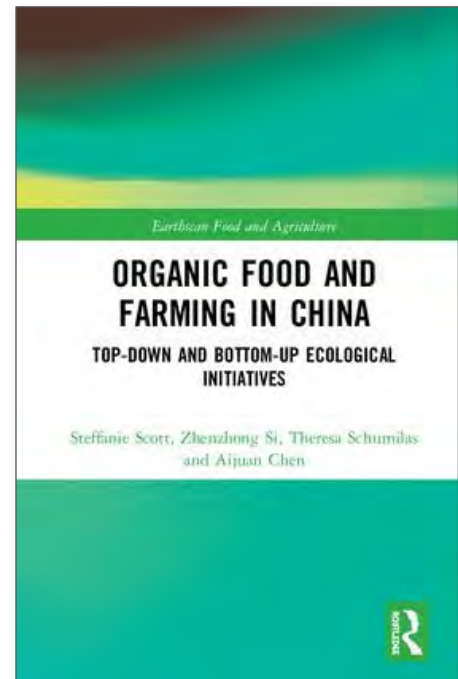
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An in-depth look at Chinese alternative food networks

Review by Anthony M. Fuller, University of Guelph*

Review of *Organic Food and Farming in China: Top-Down and Bottom-up Ecological Initiatives*, by Steffanie Scott, Zhenzhong Si, Theresa Schumilas, and Aijuan Chen. (2018). Earthscan Food and Agriculture, Routledge, London and New York. Available in hardcover and ebook; 236 pages. Publisher's website: <https://www.routledge.com/Organic-Food-and-Farming-in-China-Top-down-and-Bottom-up-Ecological-Initiatives/Scott-Si-Schumilas-Chen/p/book/9781138573000>



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This book is an important contribution to our knowledge and understanding of rural China in a time of economic slowdowns, continued urbanization, and growing political unease in China. In this light, a focus on food and farming, particularly the organic sector, is welcome as it shrinks the

big picture into one of its constituent parts, which permits for a more digestible view of the nature, potential, and limitations of China's alternative food sector.

The book is mainly about alternative food networks (AFNs) and, in particular, the community supported agriculture (CSA) form of networking between farmers and urban consumers. The connection between the two is much closer than in the industrial food system, where the environmental and health costs of the long food chain (multiple stages of processing and transportation) make the industrial food system potentially unsustainable. For the Chinese state, once the food security issue had been solved, the main perceived asset of the

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industrial food system is that of labor absorption and profits—not the quality, accessibility, and safety of food. This quibble and others are nicely dealt with in Chapter 2, which describes the agricultural transitions in China from the time of Opening Up in 1980 to the present, which basically produced the Chinese version of an industrial food system and a benign attitude toward the organic food sector.

Critiquing the industrial food system, however, is not the purpose of this book. The authors provide an enlightened view of CSAs, farmers markets, and buying clubs that have arisen over the past few years, which they cover in abundant if scattered detail. It is in fact one of the purposes of the book to answer why AFNs have grown so rapidly, and in response to what causes and stimuli. Here, useful comparisons are made with European and North American motivations for AFNs that do not matter in China in the same way. Instead, the overriding motive driving the growth of AFNs in China is food safety, which is a result of the many serious food scandals over the last several years. The many case studies referred to in the book demonstrate that although food freshness, environmental sustainability, and direct marketing are appreciated by consumers, it is food safety that overrides most other issues and benefits. It is important to recognize that in the main, AFNs are not an intellectual protest by consumers against the homogenizing forces of the industrial food system, but a more personal effort to avoid the health risks and doubts about processed foods.

Although the book is rich in content, being packed with facts and figures, legislative acts, pictures and case studies, sometimes it is not easy to know where to find information and explanations on specific aspects of China's many food subsystems. Composting, for example, is not allocated a mention in the index and is hard to trace in the text, despite its importance in the concept and practice of organic farming. What is covered comprehensively, however, is why many organic producers eschew certification. Avoidance of association with doubtful practices and institutions that are expensive and of questionable benefit to smallholders is well documented in several areas of the book. How the ecological farming movement

began with, somewhat surprisingly, early support from the central state in the 1990s is also of considerable value. Chapter 3, "State support for Ecological and Organic Agriculture in China," provides a good account of the top-down interest and intervention in the organic farm sector, and how, over time, it has been steered toward large-scale production and export markets. Most of the organic products from scale production are certified.

Each author has a chapter to themselves. The chapter on farmers cooperatives by Chen and Scott deconstructs not only the inappropriate use of the term cooperative, but how such flexible interpretations of membership roles and responsibilities, as well as relations with the State, have enabled many new organic enterprises to get started. This illustrates the business approach to organic farming rather than the ideological origins of organics more commonly found in the West. The recent Chinese cooperative movement has become a vehicle for promoting new arrangements among farmers and food business entrepreneurs to access government fiscal and technical support. The contemporary Chinese cooperative is an example of Chinese pragmatism.

The chapter "Economic, Ecological, and Interpersonal Dimensions of AFNs," by Schumilas provide an important view, in a nicely personal and descriptive manner, of the complex local circumstances in which the organic sector has developed in many parts of China. This is extended in another interesting chapter by Schumilas on community organizing in China, which reintegrates the AFN movement into the broader contexts of traditional social patterns and restrictive political issues in China.


The most well researched chapter in this book is "Farmers' Markets as Contested Spaces," by Zhenzhong Si. Although based on only one case study, the rigor and depth to which this case is exploited raise many interesting questions for future research on the topic of farmers markets. Discussion on multiple roles and perspectives, the contested nature of what (and who) the market is for, and the tensions that arise around what is 'local' are well traced and juxtaposed among the many actors.

In Chapter 9 by Si and Scott, an effort is made to relate AFNs to rural development in China,

which is doomed to disappoint, because there is no 'official' rural development in China, other than several attempts at rural industrialization during and since the time of Mao. Instead, the authors trace the origins and revival of the Rural Reconstruction Movement, which was an attempt to reinstall many of the values and principles of rural communities as envisioned by a well-meaning group of urbanites. The New Rural Reconstruction Movement (NRRM) becomes the main focus of Chapter 9 and demonstrates the problems of third-sector initiatives in contemporary China, as the connections between CSAs and NRRM are frowned upon by the state. Nevertheless, as elsewhere, and for English-only readers in particular, the tracing of the development of such movements is of considerable value, as their existence and experiences are largely unknown in the West.

This account of alternative food networks embedded in the context of contemporary rural China is of immense value in unravelling the many layers of complexity regarding food systems and the various aspects of the AFN phenomena. Much of the inference in the text is about trust: lack of con-

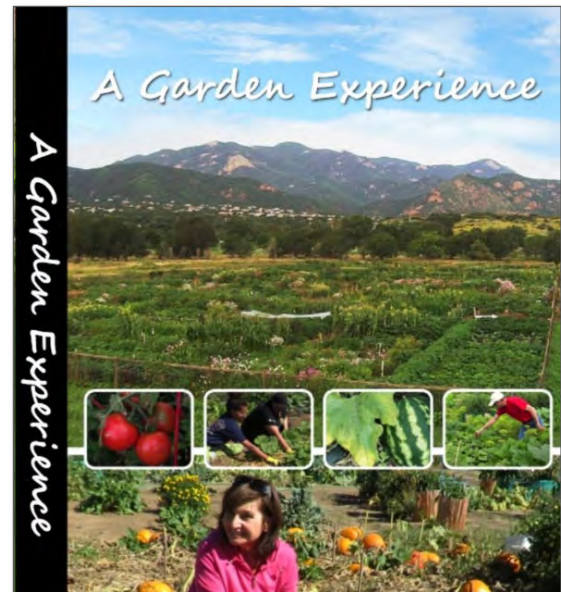
sumer trust in the industrial food system, lack of trust between organic farmers and government, between organic farmers and eco-certification, etc., while building new forms of trust through farmers markets and CSAs. This is effective partly because many urbanites are only one generation away from the farm and easily gravitate to what is familiar and perceived as trustworthy.

It is also particularly pleasing that the style of the book is open and friendly, with many photographs of the lead author undertaking her field work. This authenticity of style softens the dominant presence of the formal state in matters of agriculture, which is dealt with in only a mildly critical way. The perspectives of the two Chinese authors helps make this volume authoritative and credible. The book is informative and easy to read. As a yardstick of contemporary alternative issues in rural China, this book is an important reference and provides scholarship with a friendly face. The group leader, Professor Steffanie Scott, is to be congratulated in coordinating a coherent account of this somewhat eclectic research field of organic food and farming in China. 

Growing a garden community: A film review

Review by Brian Raison, Ohio State University
 Extension*

Review of the documentary film *A Garden Experience: Growing Organic*, directed by Nancy Bentley and produced by Nancy Bentley and John Atkinson. (2018). Film’s website: <https://www.amazon.com/Garden-Experience-Growing-Organic/dp/B0812C8B7Y/>



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“It’s not about the vegetables. It’s about community.”

Are you looking for some inspiration for a local food group, garden club, or association meet-

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ing? Would you like to set the stage of an event—perhaps a food summit or a gardening or agricultural conference—with a positive message about food and community? *A Garden Experience: Growing Organic*, a film about an organic community garden project in Colorado, may provide that inspiration. As one of the participating gardeners says, *“It’s not about the vegetables. It’s about community.”*

Last summer, I attended the inaugural Germinate International Film Festival¹ in Hillsboro, Ohio (Aug. 16–19, 2019). There, I happened to sit in on a viewing and discussion of *A Garden Experience*:

¹ The festival itself was conceived by Dr. Brooke Beam, agriculture and natural resources and community development educator with Ohio State University Extension. The selected films that were screened came from Canada, India, Italy, Mexico, the Netherlands, Senegal, and the United Kingdom; from the U.S., they came from Arkansas, Alabama, California, Colorado, Florida, Illinois, Kansas, Kentucky, Maryland, Missouri, Montana, New York, North Carolina, Ohio, and Pennsylvania. Filmmakers attended from California, Colorado, Kentucky, Montana, New York, and Ohio.

Growing Organic. Filmmakers Nancy Bentley and John Atkinson invested a year at the Bear Creek Community Garden, capturing not only the physical inputs and outcomes of running a community garden in southern Colorado, but also the stories behind the gardeners themselves.


This inspiring short documentary compresses a year in the life of a large organic community garden into 28 minutes. It shows the struggles and joys of volunteering, spring tilling, planting, board meetings, potlucks, wildlife sightings, and harvesting. But the real beauty comes as we peer into the lives of a small group of organic gardeners who, together, overcome the challenges and share the rewards of the experience. The filmmakers note that the message is clear: *“If these determined gardeners in southern Colorado can succeed in going organic, so can other gardening enthusiasts everywhere as well.”*

It must be noted, and the filmmakers agree, that although organic food options may provide positive health, nutrition, and environmental benefits, organic foods and products can be significantly more expensive than going conventional. In response, the film posits an alternative: tend your own organic garden. This, of course, is easier said than done, and that “how-to” is really not addressed. Hence, I suggest setting aside the organic

vs. conventional growing, and focusing on the community aspect of the film. That is where I found great inspiration.

As a community development educator for Ohio State’s Extension service, I saw a dozen reminders of why I do this work. I was moved to both laughter and tears by stories of gophers eating sweet potatoes, and how this garden was helping to heal people, both mentally and physically.

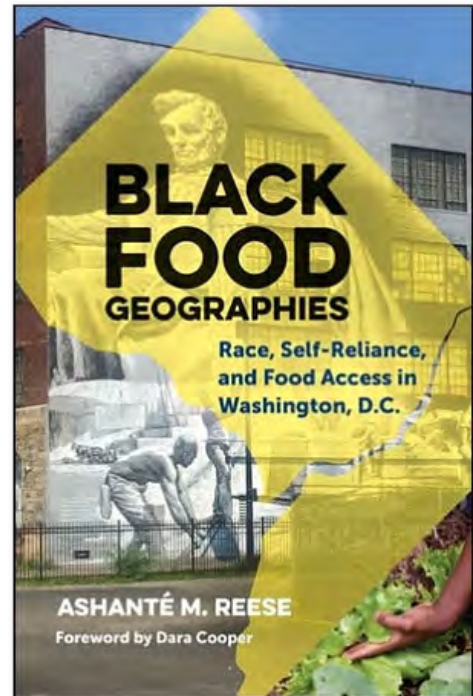
I was inspired and reminded of the opportunities to connect with diverse populations who bring such strength and beauty to whatever undertaking is at hand. And I began thinking about how I could simultaneously discover, again in *my* work, a greater understanding of this world and how my small part might result in positive action and outcomes, such as seen in this garden.

If you watch this film, you will be inspired and heartened by coming to know the participants. You will think differently about the communities where you work. Your respect for people and *their stories* in your work will grow. If you set aside the organic vs. conventional piece and simply focus on the community, this film will inspire you. Whether watching with a group, or alone in your office, give it a viewing. Share it at your next meeting. You’ll be glad you did. 

Black residents navigate an unequal food landscape in Washington, D.C.

Review by Renee Brooks Catacalos, Sustainable Agriculture and Food Systems Funders*

Review of *Black Food Geographies: Race, Self-Reliance, and Food Access in Washington, D.C.*, by Ashanté M. Reese. (2019). Chapel Hill: University of North Carolina Press. Available as hardcover, paperback, and ebook; 184 pages. Publisher's website: <https://www.uncpress.org/book/9781469651507/black-food-geographies/>



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In *Black Food Geographies: Race, Self-Reliance, and Food Access in Washington, D.C.*, Dr. Ashanté Reese guides us through the interconnected issues that affect the food landscape in many low-income Black communities, through the words and experiences of residents of Washington, DC's, Dean-

wood neighborhood. In examining residents' "geographies of self-reliance," she uses the neighborhood as a prism to refract the intertwining and contradictory forces hidden within the inaccurate label "food desert." As she says in her concluding chapter, "The neighborhood functions as an intermediary space where macro-level processes, such as where resources are placed, can be connected to micro-level processes, such as how residents determine what to buy and where to buy it from" (p. 131).

In the Introduction, "Black Food, Black Space, Black Agency," Dr. Reese examines how decades of intentional anti-Black policies intersected with the development of the term "food desert" and argues that "food apartheid" may be the more accurate way to describe neighborhoods like Dean-

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wood. She also shares her methodology and gives some background on her own path to this work as a Black feminist anthropologist. Her liberal inter-persion of verbatim interviews centers the experiences of individuals in Deanwood and, importantly, highlights the different ways Deanwood residents of varying ages, economic resources, and perceived social status both reflect on and respond to the challenge of getting the food they need and want.

Chapter 1, “Come to Think of It, We Were Pretty Self-Sufficient: Race, Segregation, and Food Access in Historical Context,” orients the reader to the Deanwood neighborhood’s history, both as a specific historically Black community within the nation’s capital and as a stand-in for the thousands of low-income, mostly minority communities whose food resources slowly disappeared as the food system consolidated in the 20th century. Deanwood is located in the quarter of the city that is east of the Anacostia River. Its relative isolation drew Black families after the Civil War, who built a self-reliant community that once included small grocers and other food retailers. Eventually, the physical and symbolic separation from the rest of the city also separated Black residents from many of the city’s economic opportunities, including access to options for grocery shopping.

Chapter 2, “There Ain’t Nothing in Deanwood: Navigating Nothingness and the *Un*Safeway,” describes the city’s “unequal food landscape” based on race and income. Dr. Reese then reveals the heterogeneity of Deanwood residents, the disparities in their personal resources, and the created infrastructure of community resources that underlie the demographic data through her interviews about shopping at the Safeway that is nearest to their neighborhood or finding other alternatives further afield.

Chapter 3, “What Is Our Culture? I Don’t Even Know: Nostalgia and Memory in Evaluations of Food Access,” dives into the memories Deanwood residents hold and share about grocery stores and food shopping in the past. While noting that nostalgic memories often come from people remembering “the good or best parts of their past experience” and contrasting that with the worst of their contemporary experience, Dr. Reese con-

cludes that “. . . imagined pasts provide important data for understanding the social change people would like to see or aspects of community life that they believe no longer exist” (p. 90).


As a long-time participant in conversations about local and regional food systems, I found Chapter 4, “He’s Had That Store For Years: The Historical and Symbolic Value of Community Market,” especially intriguing. In their interviews, residents all spoke with pride and respect about Community Market, a second-generation Black family-owned corner grocery store. Yet they all admitted that they rarely patronized the store because it does not actually meet their shopping needs. This clash between a romanticized version of the way things used to be and the reality of actual consumer behavior is a recurring theme in efforts to relocalize food systems. Dr. Reese’s look at the structural forces at play is particularly valuable: “In the larger scope of capitalism, Black-owned businesses like [Community Market] are examples of why class analysis without racial analysis is incomplete” (p. 105).

The interplay between structural and place-based efforts to address the gaps and inequities in the food system are further explored in Chapter 5, “We Will Not Perish, We Will Flourish: Community Gardening, Self-Reliance, and Refusal.” Residents seeking to build self-reliance, especially for youth, through a community garden at a public housing complex found that “the garden itself did not radically redistribute wealth, decrease reliance on supermarkets, or . . . bring any noteworthy attention to how the residents were trying to help themselves” (p. 129). The garden, however, did provide a community rallying point through which they were able to illuminate underlying structural gaps in economic and social opportunities available to Deanwood residents.

In her conclusion, “Black Lives and Black Food Futures,” Dr. Reese points out in various ways that “food is never just about food.” She goes on to say that “self-reliance as a strategy is best realized through concerted, collective action that addresses multiple needs” (p. 138). She touches briefly on current efforts to organize a food co-op in Ward 7, the food sovereignty work of the National Black Food and Justice Alliance, and the

racial justice work of the Movement for Black Lives, all of which are ways of looking at how the Black “self” is experienced in relation to community and the seeds of the food future hoped for by residents of Deanwood and beyond. I also appreciated her powerful personal reflections on identity and engaged anthropology in food studies.

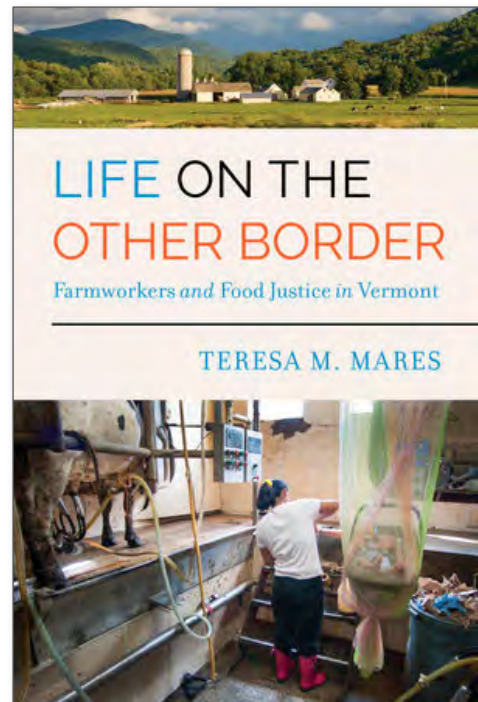
Black Food Geographies demonstrates how systemic food inequity shapes the daily experience of

people living in a neighborhood with low food access. While the book does not necessarily offer solutions, it does tell us quite explicitly that communities are not passively waiting for outside help, even though they recognize that outside change will also be needed in addition to their community-based efforts. Dr. Reese also reminds us that numbers do not tell the story. People do that, and we can learn a lot when we listen. 

The myth that farmers are well fed, and the reality of food insecurity among Vermont's agricultural laborers

Review by Emily Reno, University of Minnesota *

Review of *Life on the Other Border: Farmworkers and Food Justice in Vermont*, by Teresa M. Mares. (2019). Oakland: University of California Press. Available as hardcover, paperback, and ebook; 240 pages. Publisher's website: <https://www.ucpress.edu/book/9780520295735/life-on-the-other-border>



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Based on six years of community-based ethnographic research, Teresa M. Mares' *Life on the Other Border: Farmworkers and Food Justice in Vermont* takes readers on a journey of understanding the facets of food security, from its theoretical underpinnings to its felt experiences from agricultural

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laborers in the dairy industry. This book uses several different entry points into the complex issue of border (in)security and the implications of the current national sentiments toward undocumented immigrants. Mares' research reinforces the notion that standardized measurements are insufficient to tell the story, and that there is always more than meets the eye when it comes to the bucolic images of Vermont and its revered agricultural industry. This book illustrates the importance of entering places where food insecurity is felt and of getting close to the people whose problems we want to solve in order to be effective.

Chapter 1 outlines the theoretical frameworks that influenced Mares' research and teases apart what 'border' actually means and how it manifests,

whether at the border around the farm in question, around the private home, or between Canada and Mexico. Grounding readers in the understanding that the northern border (in contrast to the south) can be just as hostile toward migrants, Mares prepares readers to dig deeper into how both physical and regulatory structures are “porous to the movement of capital and impervious to the movement of people” (p. 33). It soon becomes clear that readers should not expect a feel-good kind of book; rather, they should expect to be challenged to reimagine the ways we institutionalize the assessment of someone’s food security.


Chapter 2 moves into a deeper exploration of household food security practices among Latinx dairy workers in Vermont by evaluating the Household Food Security Survey Model (HFSSM) and how, despite being marked as ‘food secure’ by this tool, many workers disproportionately experience food insecurity. In some cases, Mares writes, “food insecurity among farmworkers is as high as three to four times the national average” (p. 60). This fact, as well as other statistical data used to support Mares’ arguments, reveals the shockingly poor working conditions in which farm laborers in Vermont—and most likely elsewhere in the country—must operate.

Chapter 3 describes the potential for food sovereignty for Vermont’s farmworkers who participate in Huertas, a kitchen gardening project that allows farm laborers to garden near their places of residence. Mares uses this space to make a case for why food sovereignty can and should operate both as an all-encompassing movement to rebuild locally controlled food systems, and as a set of everyday practices and food choices (p. 88). This chapter helps readers understand how gardens serve as a tool for immigrants to protect their cultural and culinary heritage, despite xenophobia and pressures to assimilate (p. 93).

Chapter 4 uses Mares’ ethnographic fieldwork and interviews with stakeholders to elaborate on the challenge service providers face in providing goods and services under surveillance for undocumented farmworkers. These service providers, including state and federal agencies, community-based organizations, and individuals, must maintain high visibility for funders, employers, and larger

agencies while obscuring the presence of undocumented farmworkers (p. 26). Mares explains how Vermont’s farmworkers have limited mobility, and that service providers and informal networks are vital to creating access to outside environments and culturally appropriate foods that might otherwise be unobtainable.

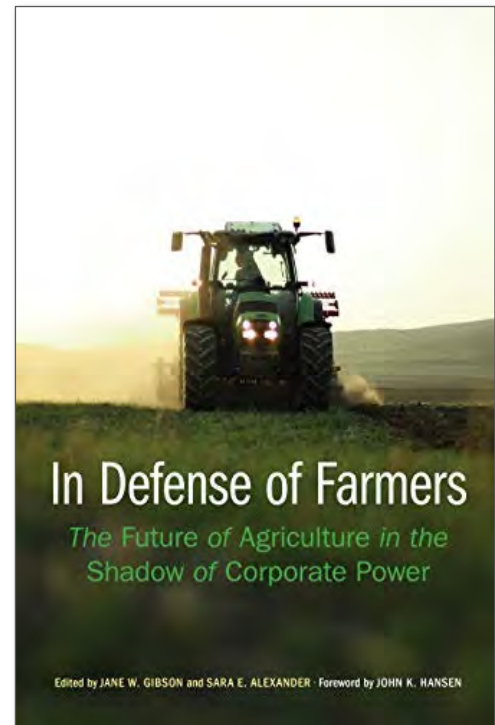
Lastly, Chapter 5 turns the reader’s attention to farmworker-led organizing efforts spearheaded by Migrant Justice, and the successes they have had in advocating for better working conditions. Mares situates the content of this chapter in light of a broader call for an overhaul of our food system to dismantle the corporate food regime (p. 148). This chapter is helpful for readers who seek to understand how successful grassroots organizing takes place, as well as how research and activism can overlap.

Life on the Other Border would be an excellent book for anyone who works in border security, agricultural labor advocacy, and/or legal protections for immigrants, because it illustrates that while we can spend years debating the theoretical frameworks that guide our understanding of the food system, at the heart of it all are people. Humans rights, dignity, and justice are in the crucible of this issue, and anyone who reads this book—regardless of their ability follow the more academic language—will find themselves wondering how our legal systems can tolerate such treatment of workers. That being said, Mares could make her research more accessible by transforming it into a reference tool for stakeholders in this field (such as SNAP-Ed educators, employees of non-profit organizations serving underrepresented populations, and rural economic development professionals). This could include main takeaways or lessons learned as bullet points or a summary table focusing on a specific policy and its outcome. Mares’ goal in writing this book was to “highlight how resiliency is found in the food-related activism and daily practices of Vermont’s migrant dairy workers” (p. 37). She successfully conveys the importance and value that agricultural laborers bring to our food system, and how their identities are often erased from the consumer experience further down the value chain. 

Breaking the cycle: Creating a sustainable agricultural system

Review by Stacey F. Stearns, University of Connecticut
 Cooperative Extension System *

Review of *In Defense of Farmers: The Future of Agriculture in the Shadow of Corporate Power*, edited by Jane W. Gibson and Sara E. Alexander. (2019). University of Nebraska Press. Available as hardcover and ebook; 422 pages. Publisher's website: <https://www.nebraskapress.unl.edu/university-of-nebraska-press/9781496206732>



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Agriculture is currently in an unsustainable cycle created by the industrial food system. Breaking that cycle and creating a sustainable agriculture system will not be easy and requires dramatically altering the food system framework.

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In Defense of Farmers: The Future of Agriculture in the Shadow of Corporate Power, edited by Jane W. Gibson and Sara E. Alexander, examines parts of the history of industrial agriculture, the current situation, and a potential future. The book would be valuable for food system leaders and policy-makers and in graduate seminars. Analyses of examples of industrial agriculture in the United States, Canada, Brazil, and Bolivia highlight unsustainable methods and suggest improvements that could serve as a starting point for dialogues and decisions on changing the food system framework.

A myriad of political, corporate, and other factors has shaped our current agricultural and food system instead of the farmers. The authors describe

how farmers have become pawns on the industrial agriculture chessboard. Large multinational corporations control the chessboard and, through political power moves, have disproportionate control of the food system. Industrial agricultural systems have promoted myths as facts and use their force to control the agricultural framework. The authors work to dispel the myths and provide facts through case studies for why this is an unsustainable cycle.

There are two polarized viewpoints of farmers; they are either heroes or villains. Most farmers operate a family farm, and forces beyond their control, including politics, economics, and ecology, challenge all of them. Our collective future depends on our ability to change the framework of the agricultural system. Separating farmers into industrial and alternative agriculture divides the group and hinders the collective voice and decision-making of farmers for changing the framework. Farmers, consumers, communities, and the environment need the benefits of farming for our continued survival and growth.

The book's 10 chapters cover three themes: the history of agriculture, our present position, and a potential improvement and path forward. The first few chapters look at the history of horizontal and vertical integration within agriculture. These include agribusinesses such as seed, chemical, genetic, and machinery companies. Their horizontal integration leaves farmers with few choices and little competition allows the companies to set their own price points.

The United States and Bolivia have seen industrialization of the poultry industry through vertical integration, where a company controls all parts of the process, from the inputs through the final product. Other sectors of agriculture, including beef and pork, are mirroring the vertical integration of the poultry industry and that could have disastrous results for our food system because farmers have no authority or control. Farmers who do not contract with a vertically integrated company cannot compete with the economies of scale and provide a viable product. These vertically integrated national and multinational companies control the farm, food, and antitrust policies that manage the agricultural framework.

In the discussion on our present state, Gibson

refers to technology as the fourth industrial revolution, noting that it is permeating every aspect of farms. Adopting automation distances the farmer from the land and ecosystem. She further explains how automation hinders sustainable agriculture systems. Next, we see a case study of groundwater depletion by California vineyards during the recent drought. Politics, power, and struggles to determine who is responsible for costs surround the complex system and regulatory attempts to manage groundwater as a resource. Regulatory systems cannot address industrial agricultural issues unless the framework is changed.

Case studies of Texas wheat farmers show that risk is about more than economics and productivity. Climate change will magnify the risks taken by all farms. Knowledge control by agribusinesses further diminishes the ability of farmers to make their own decisions. Instead, farmers rely on increasing their productivity to address diminishing profits. However, consolidation of farms into operations with larger acreage has destabilized rural communities. The structure of agricultural systems controls decisions made by farmers, but we can change that structure if we start looking at food security as national security. Family farms are the systems that provide food security, and if we shift the viewpoint, the agricultural structure will change.

The final chapter summarizes errors of previous production methods and offers ideas for how agriculture could be reshaped. John Ikerd suggests that we work together through small actions that begin on the community level, similar to the community actions taken in response to global climate change. Building sustainable agriculture systems in communities could lead to broader impacts and positive effects on the entire food system. Addressing food justice issues, supporting locally grown agricultural products, and helping farmers access land are all actions that can help confront the issues created by industrial agriculture. Economics measured in sales and profitability cannot be the only metric used to define success. Readers can use what they learn from this book to start dialogues and begin changes to curtail industrial agriculture and help support all farmers.

Changing the framework of agriculture and food systems is a critical need highlighted by the

industrial agriculture issues outlined in the book. The authors offer a limited number of suggestions or actions. Ikerd proposes a way forward in the last chapter through the community food utilities that could function like other public utilities. However, changing our food system will require addressing food system monopolies on the national and global levels as well.

There is more than one solution, and this book uses an anthropologic approach to explore what is not working and offer a potential resolution. We as agriculturalists need to work on rebuilding the

system and creating new frameworks that support and protect smaller-scale operations.

If we are to stand in defense of the farmer, as the book title suggests, we must change our agricultural framework and disband large monopolies while supporting and strengthening local farmers. Regulatory changes, antitrust laws, and cooperative models will be required for large changes in the framework. This will only happen through a concentrated effort that involves farmers, policy-makers, communities, and consumers across agricultural sectors, nationally and globally. 