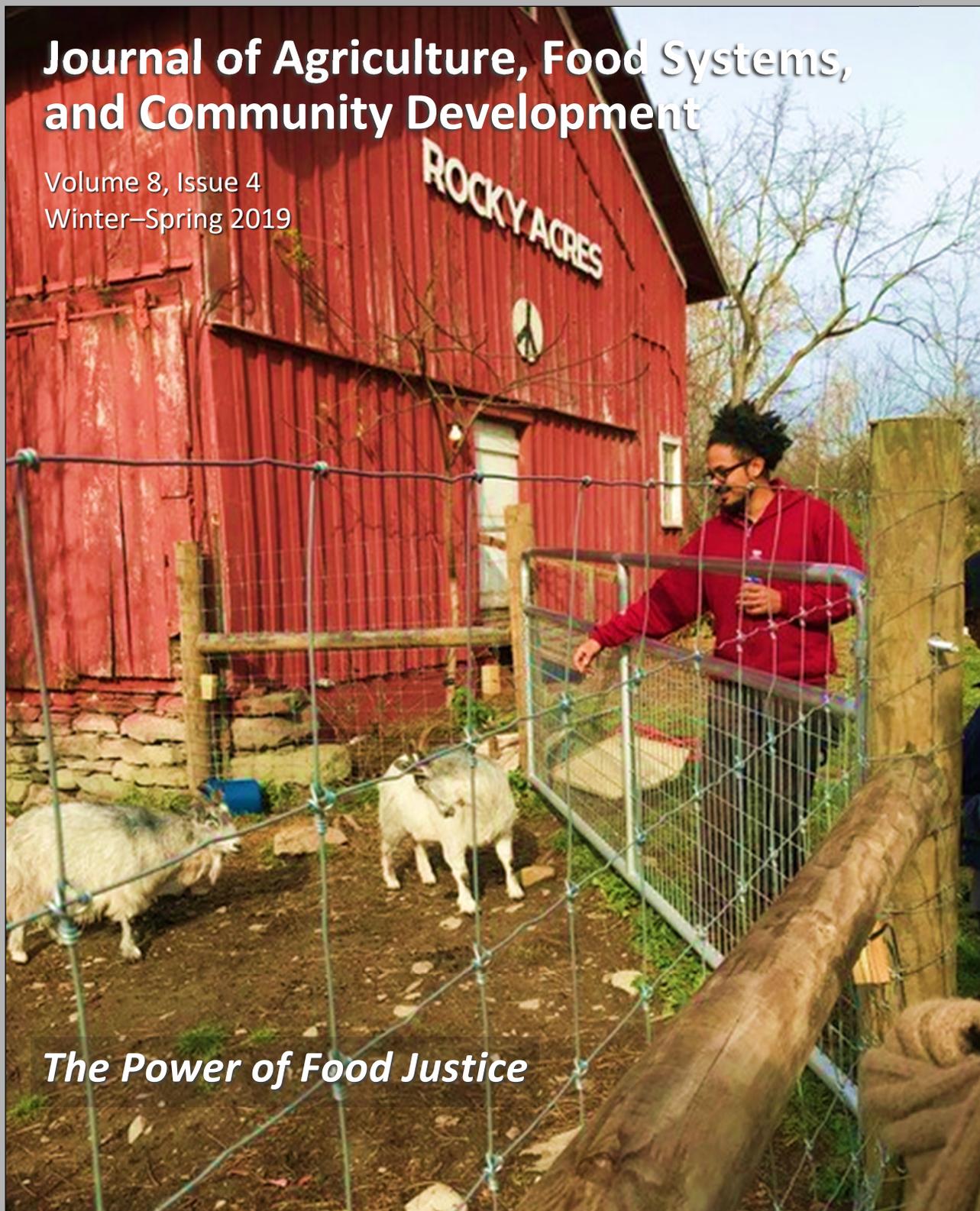


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The Power of Food Justice



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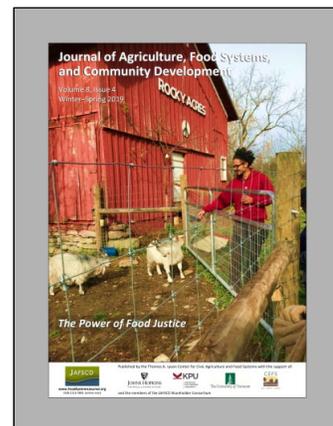
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Photo credit: Bobby J. Smith, II; used with permission.



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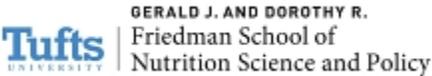
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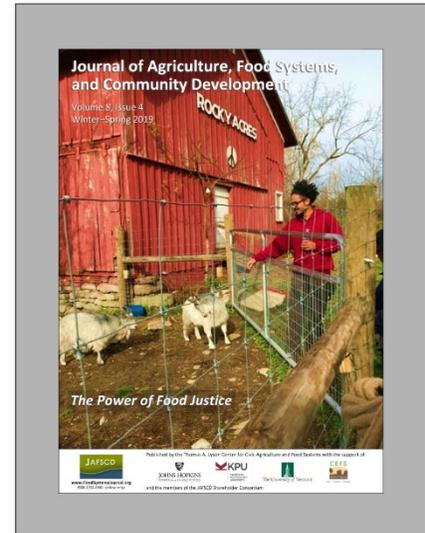
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IN THIS ISSUE
 DUNCAN HILCHEY

The power of food justice



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In this winter-spring issue, we feature a number of papers that illustrate *The Power of Food Justice*, including two papers about young African American farmers as well as the perspectives of food project stakeholders of color and of farmworkers. As depicted on our cover, farmers of color are growing as a share of all farmers in the United States, despite daunting challenges for these intrepid *agripreneurs*.

We begin the issue with columns that raise two very provocative questions. In *A New Day for Dairy?* **Teresa Mares** and guest co-columnist **Brendan O’Neill** continue to highlight the work of the grassroots group Migrant Justice and the Milk with Dignity program to bring economic justice to dairy farmworkers in Vermont. Can a price premium for milk produced under fair labor conditions move the needle in a positive direction for the ailing dairy industry? By the way, in her newly published book, *Life on the Other Border: Farmworkers and Food Justice in Vermont* (University of California Press), Teresa describes the difficulties of immigrant farmworkers living near the Canadian border.

In *The Future of Food: Separation or Integration?* **John Ikerd** reveals the dangers of attempting to separate food production from nature. As a means of mitigating challenges posed by nature, such separation may create, in fact, unintended consequences.

Our columns are followed by two commentaries. The first is by **Carol Hamilton** of Clemson University and **Brian Raison** of Ohio State University entitled *Understanding Food Labels*. The second is our inaugural JAFSCD Shareholder Commentary, from **Megan Carney**, director of the Center for Regional Food Studies at the University of Arizona, and **Keegan C. Krause**, a graduate student at UA.

Next, we present two **Voices from the Grassroots** essays: *The EarthBox Project in Grayson County, Virginia*, by **Kathy Cole** and **Liza Dobson**, who helped food pantry clientele discover the joys of container gardening;

On our cover: Rafael Aponte is the owner and operator of Rocky Acres Community Farm in the town of Freeville, just northeast of Ithaca, New York. In this photo from fall 2017, Aponte gives a tour of his 10-acre (4-hectare) operation, explaining the cultural significance of raising goats for Black and other communities of color in central Upstate New York. See the article *Building Emancipatory Food Power: Freedom Farms, Rocky Acres, and the Struggle for Food Justice*, by Bobby J. Smith, II, in this issue (<https://doi.org/10.5304/jafscd.2019.084.009>). Photo credit: Bobby J. Smith, II; used with permission.

and *The Time for Macroeconomics in Municipal Food Policy* by **Shellye Suttles**, an African American food policy council coordinator who keeps her eye on the financial big picture as she navigates the complex food policy landscape of the city of Indianapolis, Indiana.

In this open call issue, we present a number of peer-review papers intersecting with the theme of the power of food justice. In *Building Emancipatory Food Power: Freedom Farms, Rocky Acres, and the Struggle for Food Justice*, **Bobby J. Smith, II**, presents—through both historical and contemporary cases—the dual nature of food justice that includes dismantling oppressive forms of food power while building emancipatory forms of food power.

This is followed by **Leslie Touzeau's** "*Being Stewards of Land is Our Legacy*": *Exploring the Lived Experiences of Young Black Farmers*, in which the young black farmers she interviews, unlike their forebearers, share a sense of empowerment in becoming self-sufficient and autonomous.

In *What Can Be: Stakeholder Perspectives for a Sustainable Food System*, **Jesus Garcia-Gonzalez** and **Hallie Eakin** remind us that the critical first step in community organizing around food is providing the space for potential program participants to reflect on their interests, agency, and capacities in the food system space—before any efforts to build consensus and take collective action.

Next **Nadine Lehrer**, **Colleen Donovan**, and **Maureen Gullen** apply a Q study methodology to engage stakeholders in a dive deep to identify and address divergent viewpoints, in their paper *Pairing a Q Study with Participatory Decision-making around Farmworker Safety: A Case in Washington's Tree Fruit Industry*.

A Case Study of Transitions in Farming and Farm Labor in Southwestern Idaho by **Lisa Meierotto** and **Rebecca L. Som Castellano** explores the fascinating relationship between demographic trends and crop type in Idaho, and the implications for future applied research.

In another paper from the Pacific Northwest dealing with crop diversification, *Stakeholder Perceptions of the Impact of Cannabis Production on the Southern Oregon Food System*, **Vincent M. Smith**, **Maud Powell**, **David Mungeam**, and **Regan Emmons** identify a number of potential environmental and social impacts from cannabis production that need further exploration.

In *Establishing Sustainable Food Production Communities of Practice: Nutrition Gardening and Pond Fish Farming in the Kolli Hills, India*, **Suraya Hudson**, **Mary Beckie**, **Naomi Krogman**, and **Gordon Gow** assess the different approaches used by groups of home gardeners and fish farmers, discovering that form follows function in what works for each CoP.

James R. Farmer, **Angela Babb**, **Sara Minard**, and **Marcia Veldman** then discover that more than economic incentives may be required to attract some segments of the SNAP user population to farmers markets in *Accessing Local Foods: Households Using SNAP Double Bucks and Financial Incentives at a Midwestern Farmers Market*.

Net Yield Efficiency: Comparing Salad and Vegetable Waste between Community Supported Agriculture and Supermarkets in the UK, by **Nigel Baker**, **Simon Popay**, **James Bennett**, and **Moya Kneafsey** uses the innovative and comprehensive Net Yield Efficiency approach to show that CSAs produce significantly less waste than the mainstream supermarket-oriented supply chain. Note that this work is published posthumously to carry on the work of lead author Nigel Baker at the behest of his partner and co-authors.

In our last paper in this issue, *Challenges and Sustainability of Wheat Production in a Levantine Breadbasket: The Case of the West Bekaa, Lebanon*, **Salwa Tohmé Tawk**, **Mabelle Chedid**, **Ali Chalakh**, **Sarah Karam**, and **Shadi Kamal Hamadeh** identify important challenges facing the sustainability of wheat production. These include farmers resorting to hybrid wheat varieties, their dependence on wheat subsidies as an incentive, the lack of land tenure security, and the virtual absence of well-organized cooperatives.

We round out the issue with a veritable feast of book reviews:

Danielle Robinson reviews *Good Apples: Behind Every Bite*, by Susan Futrell.

David Cleveland reviews *Meat Makes People Powerful: A Global History of the Modern Era*, by Wilson J. Warren.

Jennifer Sumner reviews *Agri-Food and Rural Development: Sustainable Place-Making*, by Terry Marsden.

Amy Crone reviews *Good Food, Strong Communities: Promoting Social Justice through Local and Regional Food Systems*, edited by Steve Ventura and Martin Bailkey.

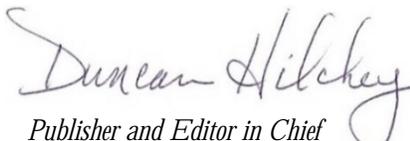
Thomas Bolles reviews *SOIL: Notes Towards the Theory and Practice of Nurture Capital*, by Woody Tasch.

Nevin Cohen reviews *From Farm to Canal Street: Chinatown's Alternative Food Network in the Global Marketplace*, by Valerie Imbruce.

Branden Born reviews *Everyday Experts: How People's Knowledge Can Transform the Food System*, edited by the People's Knowledge Editorial Collective.

I am completing this editorial as I wrap up a nine-hour layover in Philadelphia on my way to Clermont-Ferrand, France, on a Fulbright specialist project. Managing editor (and my wife) Amy Christian is joining me on this trip to evaluate a program developed at VetAgro Sup (<http://www.vetagro-sup.fr/>) that helps farmers and cooperatives do strategic planning to increase their social, economic, and environmental resilience. I am also hoping to bring back some ideas to North America that will strengthen our midlevel supply chains. The French are way ahead of the rest of the developed world in terms of agriculture and rural development. While there is a “McDo” in every larger town, the French still care about and are proudly connected to their food—and the people who produce it—in ways that are truly foreign to those of us from elsewhere. There is a lot to learn from such an agri-culinarily advanced culture.

With appreciation,



Duncan Hilkey

Publisher and Editor in Chief



CULTIVATING *COMIDA*: PUSHING THE BORDERS
 OF FOOD, CULTURE, AND POLITICS
 TERESA M. MARES AND
 GUEST COLUMNIST BRENDAN O'NEILL



A new day for dairy?

Published online February 26, 2019

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In the previous *Cultivating Comida* column, the economic challenges confronting Vermont's dairy industry were discussed alongside the new possibility of justice for workers in the industry. Following years of farmworker organizing led by the grassroots group Migrant Justice, more than a year has now passed since Vermont's iconic ice cream company Ben & Jerry's entered into a legally binding agreement committing the company to the groundbreaking Milk with Dignity (MD) program. The dairy farms in Ben & Jerry's supply chain are now beginning their second year in the MD program. During this same period, Vermont has

seen its share of highs and lows in its dairy industry, a sector that seems to have grown only more unpredictable and unsustainable over time (Mares, 2018). The MD program extends the model of worker-driven social responsibility (WSR) pioneered by the Coalition of Immokalee Workers (CIW) to Vermont's dairy farms. According to Migrant Justice, the goal of the MD program is to "bring together farmworkers, farmers, buyers and consumers to secure dignified working conditions in dairy supply chains" (Migrant Justice, n.d., "How it works," para. 1). The program centers upon a code of conduct developed by farmworkers and

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Guest columnist Brendan O'Neill is a Ph.D. student in food systems at the University of Vermont. His research focuses on how social movements strategize and organize to advance fair, dignified, and sustainable livelihoods for workers and farmers. Brendan has over 20 years of experience as a community organizer with various social, economic, and ecological justice organizations. From 2009 to 2018, he worked with the Vermont dairy worker community to help imagine, create, and build Migrant Justice. He can be reached at Brendan.ONeill@uvm.edu.

ensures a price premium to farm owners, which workers felt was essential in the volatile and challenging context of the dairy industry, in order to help offset some of the potential costs of compliance. Unlike past farmworker campaigns that have sought change through a union model, both the CIW and Migrant Justice have demanded change by shifting corporate purchasing practices and putting legally binding supply chain agreements into place. These policies require corporations to source through worker-driven programs that ensure improvements in workers' rights and are continually monitored and evaluated. This model flies in the face of the corporate social responsibility (CSR) models that are predominant in large-scale food production; these models rarely (if ever) stem from worker-defined needs and priorities, but instead from corporate concern for branding and marketability.

Over many years of farmworker-to-farmworker education and dialogue, Migrant Justice leaders adapted the essential elements of the CIW's Fair Food Program to Vermont's dairy industry, extending the WSR model to a new sector of agriculture for the first time. Both the logic and design of the WSR model draw upon the production, sharing, and institutionalization of worker knowledge to secure worker's rights in complex supply chains that often obscure the human costs of commodity production. In this model, farmworker expertise is not only acknowledged but engaged as the foundation for building workplaces that are truly fair and responsive to farmworker needs and priorities. The WSR model is itself the product of decades of CIW organizing, drawing upon workers' experiences, reflections, theorizations, and actions.

The values and priorities underlying the WSR Model—and the work of the CIW and Migrant Justice to implement this model—seek to confront directly the complex problems and unequal structures that are pervasive in the food system and in global supply chains. Fortunately, in adapting and

extending the work of the CIW and the Fair Food Program, Migrant Justice organizers did not have to completely reinvent the wheel. Instead, they were able to tap into and build upon 30 years of worker knowledge to design and adapt the lessons learned while designing the MD program. Combined with their own eight years of extensive organizing, research, and analysis, Migrant Justice engages a praxis with significant and deep history and roots—one that has seen significant success in the campaigning for and the implementation of the Fair Food Program. The CIW found, after years of direct and sometimes violent confrontations with field bosses, that the big brands at the top of the supply chain were driving exploitation in the fields. They also found that corporations have significant power to impose certain specifications on their

suppliers. Whether that buyer is Taco Bell, Wal-Mart, or McDonald's (in the case of tomatoes), or Ben & Jerry's (in the case of milk), the WSR model is unique as it places worker organizations in a position to govern over and run labor rights programs in supply chains.

During a July 2018 press conference in Burlington, Vermont, representatives from Ben & Jerry's and Migrant Justice provided an update about the progress made under

the MD program. They shared that following the formal signing of the agreement between Ben & Jerry's and Migrant Justice in October 2017, 72 dairy farms had enrolled in the program. These farms—the majority in Vermont and a handful in northeastern New York—provide 100% of the equivalent volume of milk that Ben & Jerry's sources from the Northeast dairy industry; this represents the vast majority of milk the company sources globally. More than 300 farmworkers and farm owners from these farms have attended education sessions where they learn about the rights and responsibilities of the MD program. This progress is impressive given the infancy of the program; it is also striking considering the small

In this model, farmworker expertise is not only acknowledged but engaged as the foundation for building workplaces that are truly fair and responsive to farmworker needs and priorities.

staff of both Migrant Justice and the Milk with Dignity Standards Council (MDSC), the independent nonprofit responsible for implanting, monitoring, and evaluating the MD program. Despite the initial success of this program, it is important to note that Ben & Jerry's is just one buyer among many. The Vermont farms in Ben & Jerry's supply chain make up just under a tenth of the approximately 750 dairy farms that remain in a state where more than 11,000 farms operated in the mid-1900s but likely represent a more significant volume of the state's total milk production.

In October 2018, the MDSC, the newly formed designated third-party monitor of the MD program, held an event to mark the one-year anniversary of the MD Agreement. Tom Fritzsche, executive director of the MDSC, presented evidence suggesting that the MD program is making steady progress to guarantee and secure fundamental rights and protections for the nearly 300 workers covered by the program. He shared, "more than anything, the MDP is creating a space for new dialogue and the voice of farmworkers to be heard." The MDSC then pointed out that dairy workers routinely handle copper sulfate or formaldehyde on farms for foot baths for cows, which can be dangerous to workers' health. It also highlighted that, though many farms provide and train workers in the use of protective facemasks and goggles, there are many others that do not. Now, the MD program is changing this: all farms must comply with this critical health and safety issue. Further, as of October 2018, just nine months after the first farms began enrolling in the MD program, the MDSC received nearly 70 inquiries on its new 24-hour worker's support line. This resulted in the investigation and resolution of 39 complaints of violations of the MD Code of Conduct, delivering on the promise that this model is much more than standards—it is about compliance and the enforcement of rights.

The Milk with Dignity program positions workers to envision and develop entirely new systems and forms of governance that sustain, nourish, and democratize healthy and resilient workplaces and communities.

Nonetheless, at the very time the MD program is set to grow and expand, Migrant Justice and its allies will be facing a dairy industry that consistently fails to provide farmers with a price for milk that covers the costs of production. For the MD program to flourish in the long run, it may take big brands paying more down the supply chain, or even workers and farmers building nontraditional alliances to push for major dairy policy reforms in order to stop the downward pressure of low prices on farm income and farmworker conditions. Some Vermont farmers are looking north to Canada's

supply management and price floor policies for inspiration (Dillon, 2018). In the meantime, the MD program, and the WSR model more broadly, positions workers to envision and develop entirely new systems and forms of governance that sustain, nourish, and democratize healthy and resilient workplaces and communities. The MD program provides workers with the space to define, govern over, and enforce rights in the short term. In the long term, it also may provide meaningful

insights and channels for fostering increasingly fair, dignified, and participatory communities that actually work for workers at broader scales.

Both authors of this column have been closely involved with Migrant Justice as the MD program has been designed and implemented. O'Neill was a founder of Migrant Justice and was involved in the development of the Milk with Dignity program. Mares has served on the board of Migrant Justice since January of 2017 and previously volunteered for the organization beginning in 2011. As food systems researchers and food justice activists, we are optimistic that Migrant Justice is now well positioned to expand essential fundamental human rights to thousands of dairy workers through the expansion of the MD program to other supply chains. The expansion of the MD program, like the expansion of the Fair Food Program, will require public campaigns that offer unlimited opportu-

nities for workers to engage allies in meaningful organizing work to win rights for workers. As we have seen in the successes of the CIW and the Fair Food Program, and now with the Milk with

Dignity program, when workers are positioned to govern over and manage labor rights programs in supply chains, a fundamental shift in power becomes possible.



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THE ECONOMIC PAMPHLETEER
 JOHN IKERD

The future of food: Separation or integration?

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In a previous Economic Pamphleteer column, I wrote of a battle for the future of food and farming (see Ikerd, 2018). The battle is between those attempting to *fix* the current agri-food system versus those attempting to *replace* it. The defining question is whether agriculture can be *separated* from nature and society or instead must be *integrated* with nature and society. I used hydroponics and concentrated animal feeding operations

as examples of attempts to separate or insulate agricultural production from the vagaries and fragilities of nature and the sensitivities and vulnerabilities of society. Synthetic proteins, manufactured from neither plant nor animal tissue, is perhaps a radical example of the separation currently promoted by some food futurists (Locke, 2016).

Admittedly, separating, or at least insulating, some intensive systems of plant and animal production from nature reduces their most

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Why an Economic Pamphleteer? Pamphlets historically were short, thoughtfully written opinion pieces and were at the center of every revolution in western history. I spent the first half of my academic career as a free-market, bottom-line agricultural economist. During the farm financial crisis of the 1980s, I became convinced that the economics I had been taught and was teaching wasn't working and wasn't going to work in the future—not for farmers, rural communities, consumers, or society in general. Hopefully my "pamphlets" will help spark the needed revolution in economic thinking.

apparent negative ecological and social externalities. Separation may also reduce production risks and increase economic efficiency. However, separation often raises far larger questions. As humans, we have evolved along with plants and animals as our food sources. The evidence is now clear that diet-related illnesses have increased dramatically as societies have shifted from diets made up of locally grown, raw, and minimally processed plant- and animal-based foods to industrially produced, processed, and manufactured foods (World Health Organization, n.d.). The economic costs of public health externalities are sometimes mentioned, though rarely estimated, but the total cost of human suffering from diet-related illnesses is incalculable.

The evolution of food systems obviously has become disconnected from evolution in the human species, and humanity is suffering the consequences. Furthermore, a fundamental challenge of the strategy of separation is that the problems related to our current food systems are inherent in the systems as wholes, rather than specific components or aspects of the systems. The mechanistic nature of today's industrial food systems inevitably conflicts with the organismic nature of the ecological and social systems within which they function. Attempts to solve specific problems to make systems *less bad* often create unintended consequences that instead make them *worse*.

A prime example is the pervasive use of the herbicide glyphosate. When it came on the market in the 1970s, it was heralded as an environmentally benign alternative to toxic herbicides and was promoted as a practical tool for conservation tillage. However, glyphosate was recently labeled as "probably carcinogenic"—after becoming ubiquitous in our environment (World Health Association, 2015). In addition, reduced tillage systems

simplified crop production, allowing farms to become still larger and fewer—continuing the economic and social decline of rural communities. Systemic problems are sometimes referred to as "wicked problems." (Ikerd, 2016a). They are characteristic of problems with complex, interconnected, dynamic systems, such as the agri-food system. Systemic problems are extremely difficult, if not impossible, to solve—without changing the whole system.

Another potentially fatal problem of the industrial food system is that it has failed to provide food security, as I have emphasized in previous columns (Ikerd, 2016b). This again is a reflection

of a fundamental flaw in the system. The basic motivation for adopting industrial strategies of food production and distribution is to improve economic efficiency, and it was argued that this would lead to improved food security. Over time, the economic advantages of specialized, mechanized, large-scale production have been transformed into political advantages. Resulting farm and food policies have allowed industrial systems to persist, in spite of their negative impacts on nature and society. These are natural consequences of systems where economic efficiency is allowed to take priority over social and ethical responsibility. A food system

driven by individual economic self-interests will neither ensure healthful, nutritious foods for *anyone* nor meet the basic nutritional needs of *everyone*.

In my previous column, I suggested that the logical alternative to the current industrial agri-food production are systems that reconnect and integrate farming and food production with nature and society. Organic, ecological, biological, holistic, regenerative, and other promising alternatives to industrial agriculture share the basic principles of "agroecology." Agroecology recognizes and respects the inherent interconnectedness of agri-

The mechanistic nature of today's industrial food systems inevitably conflicts with the organismic nature of the ecological and social systems within which they function. Attempts to solve specific problems to make systems *less bad* often create unintended consequences that instead make them *worse*.

food systems with the natural and social environments within which they function. If such alternatives prove successful, they will *avoid*, rather than solve, the ecological and social problems inherent in the industrial agri-food system.

However, agroecological agri-food systems still face many of the same challenges as the current food system. First, the fundamental purpose of food production and distribution is food security, meaning that there is enough safe, wholesome food to meet the basic nutritional needs of everyone. An agri-food system that cannot meet the needs of the present, as well as the future, is not sustainable. Global research has shown that agroecological farming systems are capable of sufficient expansion in production to meet global food demands (International Panel of Experts on Sustainable Food Systems, 2016). However, the question remains of whether the research results for individual farms and farmers can be replicated and extended to enough farms and farmers to essentially replace the current industrial food system.

Perhaps the greatest challenge in replacing the industrial food system is economic viability. In meeting this challenge, economic efficiency and profitability must be accepted as a *means* of ensuring food security, rather than the purpose or primary motivation for engaging in food production. As experiences of past decades have proven, “cheap foods” produced by profit-driven systems are not a solution to hunger or food insecurity. The food sovereignty movement is an attempt to insulate local food security from profit-driven economies and to integrate food production with local ecological and socioeconomic communities. Food sovereignty would ensure both food security for local consumers and economic viability for local farmers as basic human rights (Ikerd, 2016b). Admittedly, food sovereignty in America will require a major cultural shift, but such a shift

could logically begin with individual bioregions and communities.

Finally, there seems to be no middle ground between separation and integration. As industrial producers move toward integrated agri-food systems, they eventually compromise their economic efficiency. They lose their ability to compete for consumers who prioritize low prices, but they are too large to survive in niche markets. As agroecological producers specialize, standardize, and scale up to gain economic efficiency, they eventually compromise their integrality with local ecosystems and communities and become less “different.” They lose their ability to compete for customers willing to pay premium prices for foods with ecological and social integrity, but are too small to compete in mass markets.

That being said, the vast majority of U.S. farmers are still small enough to transition from producing commodities for global markets to producing foods for their local communities or bioregions. Government farm programs have subsidized the development of industrial agriculture and could be equally effective in supporting a transition to sustainable agriculture. Over time, differences in production costs would shrink, if not disappear. The greatest challenge of localization over the long run will be to reduce the costs of local processing and distribution. This will require cooperation among local producers to realize *affordable* economies of scale without sacrificing their local identity. Local foods must be affordable but need not be *cheap*.

Local food systems will always require some degree of insulation from the competitive pressures of global markets to maintain their ecological and social integrity. Regardless, there seems to be little choice other than to either separate or integrate. The future of nature and humanity depends on farmers and food producers—and consumers making the right choice.

A food system driven by individual economic self-interests will neither ensure healthful, nutritious foods for *anyone* nor meet the basic nutritional needs of *everyone*.

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Understanding food labels

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Abstract

Have you ever made a purchase based on a food label? Everyone gives food labels a cursory glance, but for the many consumers who wish to make purchasing decisions that reflect their personal and social values, food labels are critical. How do you decipher the myriad of new symbols, logos, certification claims, and sometimes meaningless information presented in today's marketplace? How do you know which labels contain statements that are not regulated by governmental agencies? Can you differentiate third-party certifications from private company claims? In this commentary, we categorize and review a broad array of new label varieties, claims, certifications, and regulations. We

then describe a new online, interactive resource for consumers to help them improve their understanding of food labels. Finally, we inventory additional teaching tools and resources that may provide educators with other food label curricula for consumers.

Keywords

Consumers, Food Labels, Government-regulated Labels, Third-party Labels, Understanding of Food Labels

Introduction

Consumers rely on the information presented on food labels to make purchasing decisions that reflect their personal and social values (Wartella, Lichtenstein, Yaktine, & Nathan, 2012). Being able to decipher the information presented on food labels is an important part of making purchasing decisions. All commercially processed food items have a label that includes the product name, weight, manufacturer's address, nutrition facts, and list of ingredients. However, many labels contain

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additional statements may not be regulated. For these reasons, it can be difficult to discern what labels mean and what content is regulated or not. This commentary describes a new resource for consumers to improve their understanding of food labels. The elements of food labels commonly used by government or certifying third-party agencies were cataloged, identifying the standards for their use. Common label claims generated by producers were also cataloged with their legal definition. Additional teaching tools and resources were inventoried to provide educators with food label curricula for consumers. Lastly, it shares an interactive website that allows consumers to explore various food labels and their standards, as well as view short informational videos about food industry standards regarding labeling.

Background: Food Labels

The Food and Drugs Act of 1906 focused mainly on stopping manufacturers from producing and selling adulterated or misbranded foods. At that time, labels frequently would be worded correctly under the law but also have deceptive pictures that led to erroneous perceptions by the consumer (United States Bureau of Chemistry, 1922). Although there have been many new laws and regulations created regarding food labels, manufacturer compliance and consumer comprehension of these regulations remains problematic.

Consumers, food manufacturers, third-party entities, and the government all play an integral role in determining the contents of food labels (Golan, Kuchler, Mitchell, Greene, & Jessup, 2001). Consumers are the driving force for market labels; they use their purchasing power to influence not only what is on the market but also how products are marketed. Manufacturers are knowledgeable about which labels resonate with consumers and thus can result in premium prices (Golan et al., 2001). Third-party entities serve as regulators for specific food attributes. When producers meet the standards set by third-parties and undergo the certification process, they can use specific food labels like “organic” or “non-genetically modified organisms” (“non-GMO”). The government also influences food labels to encourage consumer safety and health, increase consumer access to

information, and promote fair competition between producers (Golan et al., 2001; Van Loo, Caputo, Nayga, Meullenet, & Ricke, 2011).

Although consumers are a driving force for market labels, their influence does not always translate into an understanding of the food label terminology. Studies have shown that in most cases, consumers purchase organic food because they believe it to be more sustainable, socially responsible, and supportive of small farms (Lessing, 2011). However, the organic label is, in fact, relaying information regarding pesticide use, livestock feed, pasturing, and restrictions on certain processes like genetic engineering (Lessing, 2011). The term “organic,” as defined by the U.S. Department of Agriculture (USDA), may not be perceived by consumers the same way it is defined by the USDA. There have been several studies conducted in the U.S. showing that consumers are willing to pay a premium of 10–25% more for organic foods because they believe them to be of higher quality (Caputo et al., 2011). Even though consumers are unable to discern physical differences between organic and conventional food they are willing to pay a premium for a product with an organic label.

Studies indicate that many consumers misunderstand food labels’ intended meaning. This confusion calls for supplemental education to help consumers understand the label claims (Shepard, 2014). Studies have also shown that consumers are unsure of whom to trust. In a study by Janssen and Hamm (2012), they revealed more trust in third-party organic certifiers than producers and processors. They also showed skepticism about the integrity of organic products, which discouraged them from buying more organic food (Janssen & Hamm, 2012). On the other hand, consumer perceptions and attitudes regarding organic food labeling can be altered through awareness of organic standards and certification logos (Janssen & Hamm, 2012).

If consumers are unable to understand the information a food label presents, it is not serving its intended purpose. Through education, consumers can better understand the information presented on food labels and then use food labels to make more informed purchasing decisions (Heimbach & Stokes, 1982). The present project

provides consumers the opportunity to become more informed about the food they are purchasing. Although there are other resources available, most focus on only one aspect of a food label. Consumers are therefore tasked with navigating numerous websites and resources to find basic food label information. Many of these sources focus on only one category or part of the food label, leaving consumers unaware of other label information. Current consumer education efforts are mainly focused on the nutrition label but often neglect to address other aspects of the label. There appears to be no single source that can provide consumers with an overview of all the categories of food labels and provide unbiased information about the standards dictating the use of specific labels. An all-inclusive resource for consumers and educators is needed to help improve consumers' overall understanding of food labels.

Overview of Food Labels

Food labels are a cost-effective way of communicating information about a product to consumers (Miller & Cassady, 2015). The U.S. Food and Drug Administration (FDA) mandates that all food labels have five components (The National Food Lab, 2013). The package must have a principal display panel (PDP) and an information panel (IP). The PDP should be the first component a consumer sees when examining a product. It must include the product identity that accurately describes the product as well as a net contents statement that provides the quantity of the product. Nutrition facts, ingredients, an allergen statement, and a signature line are contained on the IP, which is located to the right of the PDP. Federal Code 21 details acceptable scenarios for nutrition facts (21 U.S.C. § 101, 2008). The ingredients must be listed in descending order by weight (21 U.S.C. § 101, 2008). If the product contains any allergen (milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, or soybeans), an additional allergen statement must be included (21 U.S.C. § 101, 2008). The last required component is a signature line, which includes the name and address of the responsible party (21 U.S.C. § 101, 2008). However, most packages contain additional information, including product seals, certifications, and

information about how and where the product was made. The FDA and USDA regulate some claims to protect consumer interest by prohibiting false and misleading food labels (Negowetti, 2013). Despite this, many terms used by manufacturers to elicit consumer favor are not regulated.

There are three possible origins for food label claims: government certified, third-party certified, and producer claim. Labels, seals, or certifications issued by the federal government have been inspected or guaranteed by trained inspectors or auditors. Third-party certifications can originate from consumer demands, and hold manufacturers to specific growing, environmental, processing, and/or handling standards in order to label their product with a branded claim. The last type of claim seen on packaging is that of the producer. Although by law these claims must not be false or misleading, they are defined by the producer and are not held to a standard definition.

Government labels

There are three main reasons the government is involved with food labels: (1) to ensure fair competition among producers, (2) to provide consumers with basic product information, and (3) to reduce health and safety risks of consumers (Golan et al., 2001). Two federal government agencies, the FDA and USDA, help ensure that food products are safe, wholesome, sanitary, and properly labeled (U.S. FDA, n.d.).

Current USDA seals, certifications, and labels were created by the USDA's Agricultural Marketing Service (USDA AMS) to guarantee the quality of American food products and add value to those products (USDA, 2017). The USDA uses these labels for dairy products, fruits, vegetables, specialty crops, organic agricultural products, poultry, eggs, beef, other livestock, and products approved by laboratory testing (USDA AMS, 2017b).

One of the newest labels is the USDA Organic Seal. Organic food products can be placed into three categories: 100 Percent Organic, Organic, and "Made With" Organic. Each of these categories has its own requirements with which farms and businesses must comply in order to label and market their products as organic (USDA AMS, 2017b). According to the USDA:

Organic food is produced without using most conventional pesticides; fertilizers made with synthetic ingredients or sewage sludge; bioengineering; or ionizing radiation. Before a product can be labeled 'organic,' a Government-approved certifier inspects the farm where the food is grown to ensure the farmer is following all the rules necessary to meet USDA organic standards. (Gold, 2007)

Country of Origin Labeling (COOL) is a USDA requirement that certain food items must be labeled with information regarding the source for muscle cut and ground meats (lamb, goat, venison, and chicken); wild and farm-raised fish and shellfish; fresh and frozen fruits and vegetables; peanuts, pecans, and macadamia nuts; and ginseng (USDA AMS, 2017a). The COOL requirement is different from the previously mentioned government-regulated labels because there is not a standard label. The retailers are simply required to identify the country of origin, which could mean a package label, stamp, handwritten indication, or simply a visible sign on the product display.

Third-party labels

In addition to government-regulated claims, third-party organizations have taken it upon themselves to develop their own labels. Third-party labels can enhance the intelligibility and credibility of certain food attributes through the use of standards, verification, certification, and enforcement (Golan et al., 2001). Some of the more common third-party labels include American Grassfed®, Non-GMO Project Verified, Fair Trade Certified, Certified Angus Beef®, and Rainforest Alliance. Each third-party organization has its own set of standards that producers must follow to use their trademark design. Most third-party organizations communicate these product standards to consumers through their website.

Unlike government-regulated labels, which are intended to protect consumers from false and misleading information, third-party organizations have their own motives. Each organization's motives are

different; some include animal welfare, environmental issues, local economic impact, or religious, cultural, or marketing interests. These labels provide consumers with additional information about the product that can be used at the consumer's discretion. Third-party labels may not be government-issued; however, they do still need to comply with food labeling laws. This means that the label itself is subject to evaluation by the Labeling and Program Delivery Staff (LPDS), a subunit of Food Safety Inspection Service (FSIS). LPDS evaluates labels for religious-exempt products,¹ labels for export with deviations from domestic requirements, labels with special statements, and claims and labels for temporary approval.

Any label that does not fall into one of the previously listed categories may be generically approved without LPDS evaluation (USDA FSIS, 2017). A producer is required to keep records of all labels and approved sketches, as well as product formulations, processing procedures, and any additional documentation to support its label's claims (USDA FSIS, 2017).

Producer labels

Claims can also be made by the food manufacturer or producer. These claims do not have to go through a government or third-party auditing system. Instead, the producer must simply ensure that the claims are not false or misleading. Some statements require that the food product meet certain standards to be used, while others are unregulated. For example, the term "free-range" is defined by the USDA as "produced by hens housed in a building, room, or area that allows for unlimited access to food, water, and continuous access to the outdoors during their laying cycle. The outdoor area may be fenced and/or covered with netting-like material" (USDA, 2015). This means that if the producer chooses to use the term free-range on their poultry or egg product, they must be able to supply evidence that the USDA standards for this term were met. Terms that are unregulated include *natural*, *100%*, *pure*, *all*, *made*

¹ Religious-exempt products are those that do not follow standard food processing procedures because of religious beliefs. Examples of these exemptions include poultry or meat processed in accordance with kosher, halal, Confucian or Buddhist laws.

with real fruit, made with whole grains, lightly sweetened, a good source of fiber, and strengthens your immune system (Silverglade & Heller, 2010). Deeming these terms unregulated means that producers can use these terms to help in their marketing strategy with little or no evidence to support them. For example, a producer of strawberry ice cream could use the claim “made with real fruit” even if the ice cream is made using artificial strawberry flavoring and a few pieces of real strawberries. These claims may be considered misleading, but they are not breaking government regulations regarding food labels (Silverglade & Heller, 2010).

Consumer Perception

Food labels serve as information guides to consumers, for “accurate, easy-to-read and scientifically valid nutrition and health information on food labels is an essential component of a comprehensive public health strategy to help consumers improve their diets and reduce their risk of diet-related diseases” (Silverglade & Heller, 2010, p. i). Not only do food labels provide health information, but they also provide insight into how the product was raised, processed, handled, and distributed. It is important to recognize the complexity of labeling decisions because the consumer population has diverse values and beliefs (Golan et al., 2001).

Although food labels are intended to provide consumers with additional information, several studies indicate that consumers lack an accurate understanding of their meaning. In a global study involving 11 countries that included the U.S., 96% of respondents were very interested in food and nutrition (Enough Movement, n.d.). But consumer comprehension of food labels and farming practices does not always align with purchasing habits. Out of the respondents, 80% look at labels and food claims before purchasing (Enough Movement, n.d.).

Consumers perceive the term “all-natural” as encompassing organic production practices; they typically have a more idealized view of organic farming than what is reality (Baker, 2015). Some of the common perceptions of products labeled “all-natural” are that there are no preservatives, no additives, no antibiotics, no hormones, no extra

liquids in meat products, no phosphates, and no chemicals (Abrams, Meyers, & Irani, 2009). They also associate the term with small family farms with livestock raised outside. Although producers are supposed to qualify an “all-natural” claim, it is not strictly defined by the USDA as is the term “organic” (Abrams et al., 2009). Some pork producers have been using “all-natural” and qualifying it with a “no hormones” statement. This may create a perceived risk in the consumer’s mind when compared with other pork products not labeled “all-natural” and “no hormones,” but growth hormones are prohibited in all pork and poultry products in the U.S. (Abrams et al., 2009). Hence, these labels are used purely as a marketing tactic with producers benefiting from the lack of consumer understanding (Abrams et al., 2009). This can hurt conventional food markets if the term “all-natural” continues to be perceived as the safer food choice (Abrams et al., 2009).

Even clear, concise food labels cannot address the problem of imperfect information (Golan et al., 2001). Consumers have to make purchasing decisions based on their private, individually calculated costs and benefits, independently of externalities and social objectives (Golan et al., 2001). If consumers are unaware of a label’s purpose and meaning, it will be difficult for it to affect purchasing behavior (Golan et al., 2001). Consumers will continue to be confused about what food labels represent unless they have access to clear explanations of government regulations and food labeling standards.

A Case for Consumer Education

Consumers must become aware of what label information is verifiable and what is just part of the producer’s marketing plan if they wish to use their purchasing power to have an influence on natural resources and the environment, personal health and quality of life, and ethical issues, as well as cultural and social aspects of the economy (Benn, 2002). Only an educated consumer can look past personal needs and consider the complete history of a product and production circumstances (Benn, 2002).

In Ohio, the Revised Code 3313.60 (2001) mandates that the high school health education

curriculum include teaching “the nutritive value of foods, including natural and organically produced foods, the relation of nutrition to health, and the use and effects of food additives.” This often includes teaching students how to read the nutrition label on food packages. However, educational resources on labeling rarely address topics beyond nutrition facts. When looking for food label information resources, there are a number of government websites that explain the USDA and FDA’s involvement with food labels, particularly nutrition labels. There are also several third-party organization websites that provide information specific to their label standards. Consumers who are interested in educating themselves must, therefore, do multiple searches and filter mainly nonscientific information regarding food labeling. Although there has been a push for more government involvement with food labels, the problem remains that consumers are uninformed as to what they mean.

Developing an Online Resource for Consumers and Food System Educators and Professionals

Based on the observed need outlined above, we undertook a project to inventory, catalog, and develop a new educational website, supporting facilitator guide, and evaluation tool that can be used by Extension or consumer educators as they teach nutrition and healthy lifestyle classes. This project was composed of three main steps.

Step 1: Catalog standards and key aspects of commonly used food labels.

This step was approached by dividing the search into three categories of labels: government issued, third-party issued, and producer issued. The government issued labels were identified using the USDA and FDA’s websites: <https://USDA.gov> and <https://www.FDA.gov>. Some FDA and USDA sources also identified third-party issued labels, which were cataloged at that time. A similar search procedure was used for third-party labels except that the sources for information became much broader. Search engines such as Google and Google Scholar were used to identify third-party labels. Search terms such as “animal welfare food

labels,” “fair trade,” “environmental protection food labels,” “seafood labels,” “certified gluten-free,” “free range,” and “grass fed.” All these are terms that are commonly seen on food packages in a grocery store. The last category of labels, producer issued, are the same claims seen in both government and third-party issued labels. The difference is that the producer is personally guaranteeing the product without any external auditing process. Google was used to search for individual producers who were making the same claims as third-party organizations; therefore a very similar search terms list was used. The documentation for these labels was slightly different in that the claims “terms” were identified and cataloged rather than the company that issued them.

Three vital pieces of information were gathered from each food label: the trademarked logo, the standards for making that claim, and who was responsible for the regulation of that claim. All food labels gathered were cataloged based on issuing body and cited according to their organization.

Step 2: Inventory of food labeling educational tools and resources currently available.

The first step was to make personal contact with Ohio State University Extension family consumer science educators (since the project was based in Ohio) and ask if they had any knowledge of food label curricula. Next, we conducted a general internet search using Google to locate resources used in both formal and informal education settings to teach about food labels. Search terms included “food label curriculum,” “consumer education on food labels,” “food label lesson,” “tools for food consumers,” “understanding food label claims,” “meat label curriculum,” “organic vs. natural curriculum,” “fair trade curriculum,” and “environmental food curriculum.” The following information was documented for each tool or resource: name, grade level, cost, focus areas and objectives, and where to access the curriculum.

Step 3: Development of a food label educational website for consumers, a supporting facilitator guide, and an evaluation tool for educators.

Development of the website. The food labels

that were cataloged were then used to develop an interactive website that consumers could search easily (<http://bit.ly/understandingfoodlabels>). These categories were determined based on the literature review of common consumer questions and areas of confusion. Categories included: allergen, animal welfare, colors, flavors, sweeteners, environmental, fair trade and fair labor, genetic modification, health claims, meat, other marketing claims, organic, references and other resources, and a label quiz.

Visual aids were created and used throughout the website to help illustrate various topics. Videos were produced as additional website content to elaborate on food labeling perceptions, explain meat labeling, and provide examples of how the Ohio Proud label is issued to producers. These videos are used to quickly engage the website user in an educational experience regarding specific food label topics.

As shown in Figure 1, the left menu lets the consumer navigate from one category to the next. The category selected is clearly labeled at the top of each page, followed by a description of the label category and then clickable logos that direct the

consumer to that label's home website. Consumers can easily navigate the website by using the main menu, which is present on all subsequent pages.

Facilitator guide. The facilitator guide was developed to help educators who are interested in teaching a consumer audience about food labels, navigate the website mentioned above, and facilitate an educational program or workshop using its content. An optional slide presentation was developed to accompany the guide.

Evaluation tool. The final component was an evaluation for use by educators facilitating a food label educational workshop or lesson. The evaluation can be used to test participants' knowledge of food labels after completing a food label workshop or training. The evaluation was designed as a series of multiple-choice questions covering basic food labeling information presented on the web resource.

Peer-review process to refine materials. As an additional step, the materials developed were peer-reviewed by an agriculture and natural resource

Figure 1. Screenshot of the Animal Welfare Claims Page from the Web Resource



Extension educator, as well as by a high school agri-science teacher interested in using the materials in a classroom setting. They were asked to review the consumer website resource, facilitator guide, and evaluation. When reviewing the website resource, they were asked to play the role of a consumer looking for information on food labels they have previously encountered. Their comments and suggestions were then used to refine the developed resources to better serve consumers and equip facilitators teaching about food labels with a facilitator guide and an evaluation tool. After revisions were made, they were presented again to the peer reviewers to establish whether the adjustments improved any previously mentioned issues.

Conclusion

This commentary outlines several tools that can be used independently or together depending on the needs of the clientele and depth of information desired. The catalog of food labels is a reference guide to the basic standards associated with specific labels. It is an excellent starting point for educators to quickly locate information, and provides a source for each label to locate additional information. The inventory of food labeling tools and resources is also a quick source of information when looking for teaching material on a particular labeling topic. Educators can access these curricula at <http://bit.ly/understandingfoodlabels>.

The online resource has a broader audience, targeting any consumer who wishes to know more about food labeling. The website is not intended for consumers to learn about every food label produced, but rather to guide them to resources on labels they are interested in or have questions about. The website does not endorse any label and does not verify the processes used to issue individual product labels. It is important for consumers to know that they have the right to know the standards, verification process, and enforcement of any label, and that they can request this information from the issuing party.

Strategies for facilitators using the catalog, inventory of tools and resources, facilitator guide, and evaluation include creating a custom workshop or program geared toward their clientele's needs.

Each of these tools can be used in its entirety; however, a more probable use is to focus these resources on a specific topic. They can review the inventory of tools and resources to see if any current curriculum meets their needs and they can customize the lesson in the facilitator guide to feature specific labels for the activities. The evaluation tool is based on the entire food label spectrum. However, it can easily be adjusted as needed.

This content is available free to educators interested in teaching consumers about food labels. The website resource is available to all internet users and can be accessed through the direct link as well as through internet searches. The food industry is constantly trying to meet the ever-changing demands of consumers, and with that comes the creation of new labels and marketing methods. Because of the nature of this industry, periodic updating of labeling regulation changes and the expanding third-party certifications will be needed. Federal food labeling regulations must be monitored for updates, so they can then be relayed to consumers. As changes in food labeling regulations occur, updates will be made to the website and subsequent materials, although ongoing funding has not been secured to ensure that this continues. The food industry can help consumer education by remaining transparent and answering consumer questions. Consumers can be an advocate for their own knowledge by asking questions and doing research into topics that are important to their values and belief systems.

These resources were designed to meet the needs of consumers. They are one step, but we still need to create more learning opportunities surrounding consumer education on food labeling. Consumers should feel comfortable and confident when they see a food label, and one way of achieving this is through familiarizing consumers with the food industry's terminology and use of labels, claims, and statements. As consumers—particularly those who wish to make purchasing decisions that reflect their personal and social values—become more informed, they can make better purchasing decisions for themselves, their families, and their community.



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JAFSCD SHAREHOLDER COMMENTARY

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Cultivating a network of citizen-scientists to track change in the Sonora-Arizona foodshed

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Over the past couple of years, the University of Arizona has launched both a new undergraduate degree program in Food Studies and a Center for Regional Food Studies (CRFS). The mission of the CRFS is “to integrate social,

behavioral, and life sciences into interdisciplinary studies and community dialogue regarding change in regional food systems. We involve students and faculty in the design, implementation, and evaluation of pilot interventions and participatory community-based research in the Arizona-Sonora borderlands foodshed surrounding Tucson, a UNESCO-designated City of Gastronomy, in a manner that can be replicated, scaled up, and applied to other regions globally.”

The CRFS’s annual *State of the Tucson Food System* (STFS) report seeks to support the efforts of diverse social actors and institutions working across various sectors of the Sonora-Arizona borderlands foodshed by collecting and synthesizing the most recent data available to underscore successes, problems, and barriers. The intended use of the report is to help inform policy at various scales and within both informal and formal policy settings.

We organized our 2018 report (Carney &

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Krause, 2019) around a particular framework, *Whole Measures for Community Food Systems* (Community Food Security Whole Measures Working Group, 2009)—a comprehensive, values-based toolkit that has been used by municipalities across North America for community development and planning purposes. The toolkit offered one means for documenting change in the Sonora-Arizona borderlands foodshed by assembling data around a set of variables and through a process that can be revised and replicated over time.

However, we found some formidable limitations in this method for documenting change in the regional foodshed. We had to rely rather heavily on secondary data from government agencies. We also found that institutions were often apprehensive about sharing data they had gathered for internal purposes, and which would have been very helpful for understanding the economics of our food system. For various reasons, we were unable to meaningfully engage stakeholders in a process of evaluating the data we collected. Arguably, it could have been mutually beneficial to integrate their perspectives in analyzing our findings. And finally, we wrestled with finding audiences that could take the findings and recommendations of the report into the realm of policy and praxis.

As a result, we are taking the report in a new direction for next year. From conversations with individuals and organizations located outside of the university, it has increasingly been made clear to those of us involved with the production of the

report that we need to change the data collection and analysis processes to realize its potential for transforming policy and to promote community development. In other words, the production of the report—from data collection to analysis and dissemination—presents an opportunity to collaborate with diverse populations and to cultivate a network across our foodshed. More specifically, our new approach will be to take a community development role in advancing a citizen-science framework. Collaborators will receive training in social science methods and a modest stipend to help answer questions about their locally specific experiences with, for instance, food insecurity, food economies, farming, environmental pressures or crises, and networks of mutual aid or assistance. We will still be using the Whole Measures framework to help serve as a guide for beginning conversations in the network. The participation of these citizen-scientists will allow outsiders, including policymakers, to view issues from locals' perspectives. This in turn will help participants to understand how they can be a part of shaping policy and have a voice in the resource management of our foodshed.

We propose a call to action for similar organizations or groups interested in measuring food systems change. We welcome input by these parties and we would be very interested in exchanging best practices. You can contact us at mcarney@email.arizona.edu and kckrause@email.arizona.edu. 

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The EarthBox Project in Grayson County, Virginia

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In 2014, Kathy was contacted by Michelle Stamper, coordinator of the local Feeding America mobile pantry program in western Grayson County, Virginia. This pantry serves clients one Monday evening a month at a local school. Feeding America Southwest Virginia sends a truckload of food from Abingdon, Virginia, and volunteers assemble food boxes that are then placed directly in clients' vehicles. Michelle had considered why the food pantry was needed, when rural Grayson County has such a rich agricultural

history. When she reached out to Kathy, she asked if the nonprofit Kathy leads, Grayson LandCare, could help her teach pantry clients how to grow some of their own food. She said that many of them grew up with gardening, perhaps at their grandparents' home, but very few gardened currently and some may not even have known how to grow vegetables on their own.

After collecting some information about pantry clients via a short survey, Michelle and

^{a *} *Corresponding author:* Kathy Cole is the president of Grayson LandCare, Inc., in Independence, Virginia (<https://graysonlandcare.org>). This 501(c)(3) nonprofit works to support the economy, environment, and community of Grayson County and surrounding areas. She partnered with Feeding America Southwest Virginia (<http://faswva.org>) on the EarthBox[®] project described here. Kathy was born in Grayson County and graduated from Galax High School and Emory & Henry College. She went on to earn a Ph.D. and spent 30 years with the Department of Veterans Affairs before retiring back home to garden, enjoy nature and help her community. She can be reached at +1-276-266-1303 or kathycole1@live.com.

^b Liza Dobson was a master's student at Virginia Tech at the time of the EarthBox Project, supporting the second year of implementation and conducting an impact evaluation for her thesis (<https://vtechworks.lib.vt.edu/handle/10919/71672>). Liza was born and raised in Maysville, Kentucky, and moved to Blacksburg, Virginia, to study mathematics and environmental engineering at Virginia Tech. After working for two years coordinating school and home gardening projects, she pursued a graduate degree studying gardening projects as a form of rural food security. She then worked two years for the Virginia SNAP-Ed program designing and coordinating a statewide healthy retail program. She can be reached at +1-606-407-1501 or erdobson7@gmail.com.

Kathy discovered that many clients were elderly and probably not physically able to garden. Talking with staff at another nonprofit that had previously experimented with planting gardens for the elderly, we learned of the enormous amount of volunteer labor that was needed to construct appropriate in-ground gardens. Another barrier we discovered was that some recipients were renters and did not own land. Therefore, in-ground gardens would not be feasible. This led us to consider container gardens, as they could be kept on porches, steps, and even tables.

As Michelle and Kathy were thinking about funding to start the program, Virginia Tech's Appalachian Foodshed Project sent out a request for proposals (RFP) for small food-security projects. Grayson LandCare applied and was granted a few thousand dollars to purchase containers, potting soil, fertilizer, and seeds. We decided to focus on bush green beans because they grow very well here with almost no pests or diseases. Furthermore, green beans are a common and well-liked food in our area.

In researching container gardens for pantry clients, we found the Cadillac of garden containers, the EarthBox®. This was specifically created for tomatoes, but being designed with deep soil, it is suitable for almost any garden crop. After the grant was awarded to our project, we called the small company that manufactures EarthBoxes. Happily, it offered us a significant discount because of the nature of our project. With a plan for moving forward, Michelle handed out applications to pantry clients. We had resources for 50 families, and we prioritized families with children. Once the families were identified, they were invited to come to the pantry location on a Saturday afternoon to pick up their boxes and seeds.



A client adds fertilizer to the EarthBox, which will slowly seep into the soil and fertilize it for the entire season. (Photo by Kathy Cole.)



Volunteers help Michelle's father combine the potting mix with water to refresh the EarthBoxes in 2015. (Photo by Kathy Cole.)



Three volunteers figure out how to assemble 50 EarthBoxes. This was shortly before a downpour began! (Photo by Kathy Cole.)

Kathy recalled two things about that afternoon: (1) the jet fighters on a training mission that came over the school with a deafening roar, and (2) the cloudburst that had us scrambling to move 50 EarthBoxes and lots of soil to a covered porch onsite. As clients arrived, they helped us assemble EarthBoxes, mix the bags of dry potting soil with water on a large tarp (the kids loved doing this!), fill the EarthBoxes with the moistened soil, plant the beans, and put the little elastic caps on the EarthBoxes. Off they went, in car trunks or truck beds, to their new homes.

Michelle was our link to what was happening, as she saw the clients once a month. One family was so delighted with their mother's enthusiasm that they bought her three more EarthBoxes! One had a failure with the beans and planted tomatoes, with great success. A few had problems with wildlife eating the produce, even on porches. We lost touch with a few families, too. Although a few folks had challenges, most reported that their beans were growing well! Michelle surveyed the group and most said they had cooked the beans "for supper," what the evening meal is called here. One or two clients had actually canned some of the beans. We were surprised that the EarthBox produced enough beans at one time to can!

The following spring, we had extra funding

and offered to refresh the EarthBoxes with new soil, fertilizer, and materials for additional container gardens. To inspire creativity, we suggested that folks use the old soil (now high in nitrogen, thanks to the green beans) to grow potatoes or tomatoes in food-grade buckets we purchased. Again, Michelle invited the same families to the local school on the first Sunday in May 2015. This time, we served lunch, courtesy of her church, in addition to providing the new materials. Everyone got a bucket with holes drilled in the bottom, seed potatoes, fresh soil for the EarthBox, and an aluminum pan of soil to plant shallow-rooted vegetables such as lettuce and radishes.

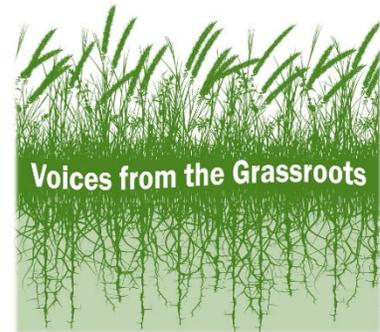
Liza, a graduate student at Virginia Tech supporting and evaluating the project for her thesis, gathered tomato starts and other plants from Virginia Tech and other local farms to hand out that day as well.

We had a wonderful day together, mixing potting mix with water in a front-end loader, drilling holes in buckets, and planting containers for the second season. There is something about getting your hands dirty together that promotes goodwill and friendship.

Liza was able to volunteer at the monthly distributions throughout 2015 to continue handing out seeds and starts to pantry clients before interviewing some folks for her thesis in the fall. We wish we had had more opportunities to meet with the gardeners throughout the project. As people are so scattered here, we only visited a few homes in May 2016 to offer extra plants and resources. If we had been able to stay more connected, we could have customized the project to better fit the needs and wishes of the clients discovered through Liza's research. Container gardening does work well because the containers can be moved if the people have to move, and they are easy to manage for people with limited mobility, such as elderly or disabled people. And nobody doesn't like green beans!

The time for macroeconomics in municipal food policy

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It's interesting—I've never felt like so much of an outsider as being an agricultural economist working on municipal food policy. And I'm a black woman in the United States. Prior to being the food policy and program coordinator for the City of Indianapolis, I was a research economist who studied local food systems, alternative energy, and climate change. Now, as a food policy practitioner, I have found that relevant aspects of classical macroeconomic theory often go ignored in municipal food policy, particularly the concept of economic change over time.

In discussions with other food system practitioners, I am always prepared to explain the importance of incorporating economic theory into municipal food policy. I most often highlight the fact that economics is not capitalism. Rather, economics is a social science that studies production, distribution, and consumption of goods and services. Economics is further split up into two studies based on the unit of study: microeconomics and macroeconomics. Microeconomics studies individual economic decisions. For instance, microeconomists would study how an individual goes about finding a job while considering their education level, financial constraints, mobility constraints, and personal preferences. Meanwhile, macroeconomics studies the economy as a whole (American Economic Association, n.d.). Macroeconomists would be more interested in overall unemployment rates, as well as the social and political conditions that contribute to this rate.

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While most Americans are somewhat familiar with capitalism, which is one type of macroeconomic system, a variety of macroeconomic systems exist across the globe. Macroeconomic systems are defined by ownership, resource allocation, or political ideology, and include socialism, capitalism, mixed economies, etc. Capitalism is simply one type of macroeconomic system in which capital goods are owned by private individuals with the goal of capital accumulation. Thus economics is a tool to understand the dynamics of all economic systems, including capitalism.

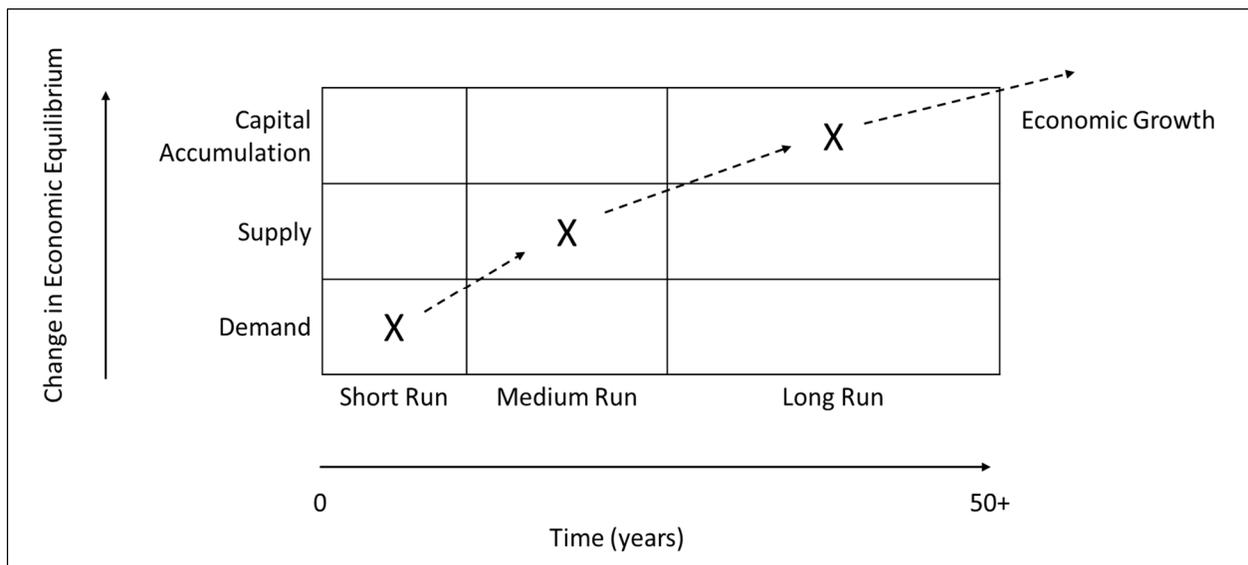
Economics has always concerned itself with food and agriculture. Hesiod, the famous Greek poet and the world's first "economist," often wrote about farming techniques, food production, and economic thought sometime between 750 and 650 BC. Adam Smith's famous *Wealth of Nations* (1776) was written solely to counter French economic thought on how best to value agricultural land. Economics should not be feared or excluded from the conversation on economic change in the food system. Instead, it ought to be considered a tool to understand the intersection between people, food, politics, agriculture, public health, and the environment.

Food policy practitioners discuss the food system across geography, across demographics, and across politics, yet I rarely hear *time* mentioned as

an element in conversations about creating economic change in our food system. Food system discussions typically involve a series of immediate food and agriculture projects (now) and a long-term idealistic vision for the food system (later), with little mention of strategies to connect the two time periods. It seems as if we are crossing our fingers, closing our eyes, and hoping it all works itself out at some unknown, later date. On the other hand, the study of economics offers a very distinct set of principles on how changes in certain economic factors will affect society and its economy over time. Nevertheless, an integral piece missing from the food system puzzle is the notion of economic change over time, particularly the demand for goods and services in the short term, the labor market in the medium term, and wealth accumulation in the long term (Figure 1).

In macroeconomic theory, economic changes are divided into time periods depending on how many economic factors change before the economy achieves equilibrium. Demand is defined as the quantity of goods and services that consumers are willing and able to buy or barter at different prices. Conversely, supply is the quantity of goods and services that producers are willing and able to sell or barter at different prices. According to Blanchard (2006), the short-run equilibrium is what happens year to year and is defined by changes in

Figure 1. Simplified Timeline of Economic Change



demand. The medium-run equilibrium is what happens over a decade and is defined by changes in production factors, such as labor, technology, and capital (e.g., financial capital, human capital, social capital, etc.). And the long-run equilibrium is what happens over multiple decades and is defined by economic and social factors that sustain growth.

The Short Run: Demand for Goods and Services

We know that the majority of Americans, across all demographics, do not eat the daily recommended amount of fruit and vegetables. In a society with these preferences, costs to the individual include increased chronic disease and medical costs, while costs to society include increased public health-care costs and reduced economic productivity (Suhrcke, Nugent, Stuckler, & Rocco, 2006; Wolf & Colditz, 1998). If food system practitioners want to encourage behavioral changes that lead to economic change in the food system, such as eating more fresh fruits and vegetables, we should start by focusing on increasing demand in the short run. According to economic theory, short-run changes in supply are driven by changes in demand (Blanchard, 2006). Changes in demand can be caused by changes in individual preferences and consumer confidence, among other factors. One might find it manipulative to encourage individuals to increase their consumption of fruit and vegetables to sustain a healthy lifestyle, but as a society, we always make choices about what goods, services, and behaviors have a social benefit. For example, in recent decades, as a society, we have determined that the social costs of smoking cigarettes (e.g., public health-care costs) outweigh the social benefits (e.g., tax revenue from cigarette sales). With this understanding, it is important that we create the demand for a healthy food system as this is a necessary first step before the supply of food, agricultural, and environmental goods and services can adjust.

The Medium Run: The Labor Market

In the medium run, the economy tends to adjust itself based on supply factors: capital, technology, and the size of the labor force (Blanchard, 2006). Therefore, after demand increases in the short run,

capital, technology, and labor adjust to create a new equilibrium in the medium run, where supply changes to meet the new demand. As economists, if we assume that technology and capital are fixed, the size of the labor force then must increase to increase production and supply. As a result, wages also adjust, depending on people's willingness to work in the economy as a whole. According to Biewener (2016), municipal food policy is often concerned with the subject of low-wage workers but shies away from the fact that many of its food and agricultural initiatives are sustained by no-wage workers (i.e., volunteers). If we know the root cause of food insecurity is poverty, it makes no sense as to why so many community food projects with economic justice missions are reliant on no-wage labor. If economic theory states that the size of the labor force is a component of the supply of goods and services, we can generally expect that a market that pays no wages will never achieve its fair-wage employment or production goals. Socially, food system practitioners must be mindful of how community food projects signal participation by residents when they do not assign economic value to their labor. Economically, municipal food policy needs to place greater emphasis on community food projects that create increased employment and, potentially, higher wages.

The Long Run: Capital Accumulation

In the long run, we must look at other factors that perpetuate food insecurity and limited food access. As economic theory suggests, technological improvements, education, savings (capital accumulation), and public policy are all factors contributing to the long-run success of an economy. In a capitalist economic system, the focus is placed on economic growth through accumulating and investing capital, which most often is interpreted to mean financial capital (i.e., money). As municipal food policy practitioners, we must be genuine in our pursuit of inclusive growth and allow all residents to benefit from the accumulation of human, financial, and social capital in the food system. If the United States is currently operating in an economic system where the goal of the game is to amass financial wealth (capitalism), we must support community and economic development

activities that allow socially disadvantaged residents to accumulate and invest financial capital. At the same time, we can work to redefine capital accumulation to include nuanced forms of capital that are most valuable to a healthy, productive society: human capital, social capital, environmental capital, etc.

Conclusion

As food policy practitioners, we must be realistic about the society we live in. We all want health, prosperity, and growth within the food system,

which will require the right combination of demand, human capital, and individual success. As a society, we will not be able to snap our fingers and undo 13,000 years of agricultural and food system development; genuine structural change will require working across disciplines, across geopolitics, across cultures, and across time. Fortunately, economists have a few thousand years of experience in agriculture, food production, and human behavior—and we are eager to help local residents achieve their food system goals, even if only by demystifying our current economic system. 

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Building emancipatory food power: Freedom Farms, Rocky Acres, and the struggle for food justice

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Abstract

While scholars who study issues of food justice use the term food power rarely—if at all—their arguments often position the rise of the food justice movement in the context of food power that sustains oppression in the food system. Similarly, many food justice activists and organizations produce an analysis of oppressive forms of food power, while placing the goals of the movement to create sustainable community-based interventions in the periphery. Yet, the pursuit of food justice is a dual process related to power. This process is characterized by the simultaneous acts of dismantling oppressive forms of food power and building emancipatory forms of food power. It also has deep roots in the historical arc of food politics in the Black Freedom Struggle of the civil rights era.

However, we know very little about this dual process and how black communities engage in it. In this paper, I juxtapose two cases of black farm projects—the historical case of Freedom Farms Cooperative (FFC) in Mississippi and the contemporary case of the Rocky Acres Community Farm (RACF) in New York—to explore the dual process of food justice. I conclude with a brief discussion on what the cases teach us about this dual process and its implications for scholars and activists who work on issues of food justice. Such implications provide insights into the possibilities of the food justice movement in the future and challenge the movement to include, more explicitly, issues of race, land, self-determination, and economic autonomy.

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Keywords

Food Justice, Food Power, Race, Land, Economic Autonomy, Self-determination

Introduction

In September of 2015, WhyHunger published a short series of stories in its website's Food Justice Voices section about the relationship between state violence against black communities and the national struggle for food justice (Beckford, 2015). Organized by co-founder of the National Black Food and Justice Alliance Beatriz Beckford, the series was designed to "to lift up the silent, often unnamed killers of black bodies that are related to food, land and the lack thereof," she argued (Beckford, 2015, p. 1). Drawing our attention to the oppressive social, economic, and political forces that shape access to food in black and brown communities, Beckford further argued that "the intricacy of America's systems of oppression have always used land and food as weapons of choice" (Beckford, 2015, p. 2). Echoing the same sentiments civil rights activist Mrs. Fannie Lou Hamer lamented in a 1968 article in the Wisconsin-based magazine *The Progressive* (White, 2017a), Beckford shed light on the many historical and contemporary instances in which food is framed as a weapon against communities of color. This weaponization process transforms food into a tool to maintain a larger agenda of racism, inequality, oppression, and marginalization. Such instantiations and processes can be largely understood as what some historians, legal scholars, and political scientists describe as "food power."

Traditionally, the concept of food power is theorized as oppressive or as a weapon in the context of inequality, global politics, and national security. Paarlberg (1978) defined food power "as the manipulation of international food transfers in the effective pursuit of discrete diplomatic goals" (p. 538). Wallenstein (1976) argued that food power is better understood as the use of food as an economic weapon to achieve political goals. Drawing on the work of Wallenstein, Gross and Feldman (2015) argued that food power uses food not only because of its economic use or "its essentiality to life, but also because of its significance to human existence: our cultural experiences, our

family and communal lives, our pleasures, and our bodies" (p. 433). They suggest that food power can be "exercised not only through direct control over food supply and food availability, but also by impacting people's access to adequate food" (Gross & Feldman, 2015, p. 380). Similarly, McDonald (2017) argued that food power could be "deployed indirectly, in the form of trade or humanitarian assistance, or directly, in the form of giving or withholding food in times of crisis" (p. 3).

Together, these notions reveal that food power is simultaneously a historical symbol of political freedom and a mechanism that creates uneven access to food (Howerton & Trauger, 2017). In international contexts, food power has maintained what sociologist Phil McMichael (2005) called the "corporate food regime," which led to the corporatization of agriculture throughout the world. This corporatization depends on production methods employed by large farms and technologies developed by large agribusinesses that ignore the detrimental impact of these methods on small and medium-scale farms and the environment (Lyson, 2004). In the U.S. context, food power manipulates access to the means to grow, consume, and distribute foods, dovetailed with the maneuverings of the corporate food regime. These maneuverings create conditions that shape how we understand food justice and the movement associated with the concept. Here, food justice is defined as a historical set of ideological commitments, frameworks, and strategies designed to eradicate inequalities of race, class, gender, and sexuality reproduced in the food system and society that contribute to the rise of hunger, poverty, and food insecurity (Glennie & Alkon, 2018; Hislop, 2015; Sbicca, 2018).

In relation to this definition, most scholars who study food justice position the movement as a direct response to the affluent and classist characteristics of consumer-led food movements (Minkoff-Zern, 2017). Some scholars have argued that the movement rises as a response to the community food security movement's main focus on white communities and producers (Alkon & Guthman, 2017). Others have even argued that food justice rises in response to state-sanctioned discrimination and racism against black farmers and native populations (Alkon & Norgaard, 2009).

While scholars of food justice use the term “food power” rarely if at all, their arguments often position the rise of the food justice movement in the context of food power that sustains oppression in the food system. Similarly, many food justice activists and organizations analyze oppressive forms of food power while placing the goals of the movement to create sustainable community-based interventions in the periphery. They also suggest a linear path to food justice that begins with dismantling oppression, followed by the building of sustainable solutions or community-based interventions. Yet, the struggle for food justice is a dual process related to power. This process is characterized by the simultaneous acts of dismantling oppressive forms of food power and building emancipatory forms of food power. It also has deep roots in the historical arc of food politics in the Black Freedom Struggle of the civil rights era and is visible through the work of a small group of black food justice activists today. We know very little, however, about this dual process and how black communities have engaged in it.

My aim in this paper is to explore the dual process of food justice by examining how it is navigated by black communities in historical and contemporary contexts. To accomplish this, I juxtapose two cases of black farm projects: the historical case of Freedom Farms Cooperative (FFC) in the Mississippi Delta during the civil rights era and the contemporary case of Rocky Acres Community Farm (RACF) in central New York State. While these two cases focus more on building emancipatory forms of food power within the dual process of food justice, they enhance our overall understanding of the entire process. In the sections to follow, I begin by briefly describing the research methods used to generate data for this research. Then, I juxtapose the cases of FFC and RACF to explore the dual process of food justice. I conclude with a brief discussion on what the cases teach us about this dual process and its implications for scholars and activists who work on issues of food justice. These implications provide insights into the possibilities of the food justice movement for the future that reach beyond the act of accessing food. These insights challenge the food justice movement to include, more explicitly, issues of

race, land, self-determination, and economic autonomy. Moreover, they reveal a neglected way of thinking about the concept of food power as a mechanism of emancipation, empowerment, and resistance, in historical and contemporary contexts.

Research Methods and Data

In order to explore the dual process of food justice, I used a qualitative collective case study approach (Stake, 1995). This approach is characterized by a set of cases examined to provide insights on a specific issue or phenomenon (Stake, 2003). It is used when a researcher is interested in a set of cases for the sole purpose of gaining insights and uncovering knowledge about a specific phenomenon, and not necessarily the cases themselves (Luck, Jackson, & Usher, 2006). Robert Stake (2003) describes this approach as the instrumental case study method extended to several cases. In the instrumental approach, “the case is of secondary interest,” Stake argued, “it plays a supportive role, and it facilitates our understanding of something else” (p. 137). While the cases are still examined in depth and situated in their specific contexts, the focus of inquiry is not the set of cases. In this study, the approach enabled me to deliberately focus on exploring the dual process of food justice via my two cases: FFC and RACF. Specifically, I consider how these two farm projects navigate this dual process in their specific contexts.

Four specific methods were used to collect and analyze data to generate the cases: archival research, content analysis, participant observation, and semistructured interviews. The data for the FFC case was collected and analyzed in three phases. First, I conducted extensive archival research at the Mississippi Department of Archives and History (MDAH) in Jackson, Mississippi. Specifically, I collected and analyzed the records of FFC and the papers of its founder, civil rights activist Mrs. Fannie Lou Hamer. The Hamer papers at MDAH include—along with her speeches, personal writings, and newspaper clippings—detailed reports, internal documents about FFC’s day-to-day operations, budgets, background information, and correspondences. Second, I merged data from my archival research with a systematic content analysis of several scholarly

secondary sources on Hamer and FFC. These include two key biographies of Hamer: Kay Mills' (1994) *This Little Light of Mine: The Life of Fannie Lou Hamer* and Chana Kai Lee's (2000) *For Freedom's Sake: The Life of Fannie Lou Hamer*. Other key scholarly works I analyzed include Asch (2008), Nembhard (2014), and White (2017a). Third, I conducted ethnographic research in the summer and fall of 2017 in Mississippi. During this time, I participated in a series of events and talks to commemorate the 100th birthday of Hamer at the Council of Federated Organization's (COFO) Civil Rights Education Center at Jackson State University. I also traveled to the original location of FFC in the Mississippi Delta and conducted semistructured interviews with two key informants at the Fannie Lou Hamer Museum who knew Hamer and her work on FFC. These questions focused on Hamer's work on poverty and hunger throughout the Delta. I wrote detailed fieldnotes about these experiences, which also helped me develop this case.

The data for the RACF case was collected and analyzed in three phases. First, I collected data through participant observation. I worked with RACF's owner and operator, food justice activist Rafael Aponte, on several farm projects and community food programs throughout Central New York, and served alongside Aponte on the inau- rural Tompkins County Food Policy Council. Through these experiences, I was able to observe how Aponte framed his food justice work not only on the farm but also in the context of the local food environment of the county. I kept a file of fieldnotes on these interactions and observations. Second, I conducted one on-farm semistructured oral history interview with Aponte. My interview questions were separated into four segments and asked about his (1) food justice activism, (2) journey to farming, (3) farm history, and (4) experience as the only black farmer in the county. After the interview, I followed up with several semistructured informal interviews with Aponte and others while developing the case to gain more insights on some things discussed but not elaborated on during the initial oral history interview. Third, to analyze the interviews and my field notes, I looked for themes that arose during our interviews

concerning his perspective on the work and process of food justice. Specifically, I used food justice as a theoretical framework to interpret these themes and develop this case.

The Freedom Farms Cooperative: Food, Race, and Land in Ruleville, Mississippi, 1969–1977

During the 1960s and 1970s, Sunflower County, Mississippi, was the epicenter of food insecurity, hunger, racism, and poverty in the U.S. At the time, over 4,000 black families in the county who resided in or around the town of Ruleville lived below the poverty line, less than 0.2% of blacks owned land, and rates of infant mortality and diet-related illnesses were among the highest in the nation (Lee, 2000; White, 2017a). In terms of labor, the majority of blacks in the county were employed by the agricultural industry. While some of them lived on plantations working as sharecroppers, by the late 1960s many were forced off plantations due to the mechanization of the cotton industry. Yet, many of those who were forced off continued to work as low-paid farmworkers on other plantations. This shift from being sharecroppers to farmworkers impacted the ways in which many rural black communities accessed employment and food, exacerbating issues of displacement, hunger, and poverty. Set against this backdrop, these conditions reshaped how many black residents viewed land. Many saw agriculture and land as sites of oppression and exploitation. However, Hamer, a former sharecropper turned civil rights activist, thought that if blacks could reimagine their relationship with land—in the context of freedom, agrarianism, and economic independence—they could be empowered to resist and survive their current plight.

At the time, Hamer was known for her work with the Student Nonviolent Coordinating Committee (SNCC) and her speech during the 1964 Democratic National Convention. However, following the passage of the Voting Rights Act of 1965, Hamer turned her attention to addressing the food needs of poor displaced black sharecroppers in the Mississippi Delta to extend the civil rights agenda. Building on her civil rights experience and a strong belief in black self-determination, Hamer founded the FFC in 1969. This cooperative was

built on a philosophy of empowerment and analysis of the importance of land (Lee, 2000). In the context of land, Hamer believed that the politics of land access were extremely important to the freedom and survival of her community. “Because of my belief in land reform, I have taken the steps of acquiring land through cooperative ownership,” Hamer stated in her famous 1971 speech, “If the Name of the Game is Survive, Survive” (Hamer, 1971). “In this manner, no individual has title to, or complete use of, the land,” she continued; “the concept of total individual ownership of huge acreages of land, by individuals, is at the base of our struggle for survival. In order for any people or nation to survive, land is necessary” (Hamer, 1971). By linking land and freedom, Hamer conceptualized a framework of cooperative ownership that cultivated “many opportunities for group development of economic enterprises which develop the total community, rather than create monopolies that monopolize the resources of a community” (Hamer, 1971). In this way, cooperative ownership opposed the “individualistic notion of economic development, freedom, or progress” (Nembhard, 2014, p. 178). This opposition in the context of black communities echoed sociologists W. E. B. Dubois’ and Chancellor Williams’ notions of black economic progression at the intersection of economic sustainability, cooperation, and community (Nembhard, 2014).

At the core of FFC was a food-provisioning program that consisted of a community “bank of pigs” and an extensive vegetable operation (FFC, 1973). Supported financially by members of FFC and individual contributors, this program created a reliable, local source of protein and nutritious vegetables for families throughout Sunflower County. One of the most influential contributors to FFC was the National Council of Negro Women’s (NCNW) program of women’s self-help and empowerment (Nembhard, 2014; White, 2017a). The purpose of this program, as stated by NCNW then-President Height, was to help “people meet their own needs, on their own terms” (Nembhard, 2014, p. 180). Aligned with Hamer’s survival plan for rural blacks and philosophy of self-determination, the NCNW’s self-help program donated the first set of pigs to support FFC’s bank of pigs in

1967 (White, 2017a). Within three years, the donation yielded over 2,000 pigs and fed over 1,000 families throughout the county.

The vegetable operation began when FFC purchased its first 40 acres (16 hectares) of land west of Ruleville. Within two years, cooperative members produced thousands of pounds of fresh, culturally appropriate vegetables to poor families, including collard greens, field peas, corn, sweet potatoes, butter beans, okra, tomatoes, and string beans (White, 2017a). Due to the high volume of vegetables produced, FFC often had a surplus, which was sent to many poor families in urban areas such as Chicago. By 1972, FFC acquired 600 more acres (243 ha) of land and expanded its operation to include cash crops such as cotton and soybeans that could be used to offset some of the farm’s debt (White, 2017a). It also dedicated land to be used for raising catfish and grazing cattle. As a result, FFC created an alternative food system that not only met the food needs of poor rural blacks but also allowed this population to use its own agricultural knowledge to produce the food. To this end, poor rural blacks used emancipatory food power to create an autonomous agrarian space to meet their needs and sustain their community.

Alongside the food provisioning program, the cooperative provided civil rights classes and subsidized housing, education, and social services to sustain poor rural blacks and whites as well (Asch, 2008). For instance, during the same year FFC purchased land to develop its vegetable operation, it also developed its subsidized housing program. This program helped over 40 families—who were mostly displaced sharecroppers and farmworkers—purchase homes with profits from FFC’s cash crops and small loans from banks willing to support the cooperative (Lee, 2000). Regarding its education and social services, FFC generated revenue to support the establishment of a grant and scholarship program. As a result, at least 25 high school students received scholarships and educational grants to “pursue college studies and vocational training,” and FFC assisted hundreds of needy families with what they called “Out Right” grants, according to a 1973 FFC status report (Freedom Farm Corporation, 1973). The Out

Right grants were given “to families in need of financial assistance to purchase food stamps or medicines, clothing, and other necessities” (Freedom Farm Corporation, 1973).

This holistic approach to addressing community food access and more broad issues allowed FFC to last almost a decade without any government support. However, according to historian Chris Myers Asch (2008), “grand visions did not translate into lasting change” (p. 259). From its outset, FFC experienced two years of drought and floods that affected crop production and had financial troubles keeping up with land payments (White, 2017a). By 1971, FFC’s social service programs began to take up more of its profit. In response to this, FFC’s board of directors decided to “separate the farming operation of the program from the social service activities” until the profit from “the farming can support the social programs” (Freedom Farm Corporation, 1973). Moreover, with the death of Hamer in 1977, the cooperative lost some of its biggest contributors who had supported the operation because of Hamer’s role.

Taken together, these dynamics led to a major shift in the day-to-day operations of FFC and the cooperative’s closing in the late 1970s. Nonetheless, the significance of FFC is rooted in its central analysis and ability to operate in its context. FFC was more than just a farming cooperative that provided a reliable source of local, nutritious foods to poor rural communities in Ruleville and the greater Sunflower County area. The analysis at the core of the cooperative was linked to a philosophy of self-determination, community action, and resilience. This analysis created a space for communities to be in charge of ensuring their own liberation from oppression, exploitation, racism, poverty, and other forms of inequality. Despite its ultimate closing, the vision for FFC lives on today through many farm projects in rural and urban black communities across the U.S.

The Rocky Acres Community Farm: Food Access, Local Food, and Race in Ithaca, New York

Since the early 1970s, Ithaca, New York (NY), has been an emblem of the alternative agriculture

movement and nationally known for its devotion to the production, consumption, and distribution of local, nutritious foods. As the largest city in Tompkins County, Ithaca’s devotion to local food is visible through a number of places like the Ithaca Farmers Market, the vegetarian-based Moosewood Restaurant, GreenStar Co-Op natural foods market, Groundswell Center for Local Food & Farming, Cornell Cooperative Extension-Tompkins County, and the Cornell Small Farms program. Additionally, the Ithaca Farmers Market offers five access points across the small city and some in the greater Tompkins County area. However, in a place like Tompkins County—where all people should be able to access local food based on its availability—many low-income people and people of color still struggle to access it. For instance, in 2016 approximately 13.5% of the county’s residents were food-insecure and 17.1% of children were food-insecure (Gundersen, Dewey, Crumbaugh, Kato, & Engelhard, 2018); 20.1% of all residents lived below the poverty line (U.S. Census Bureau, 2016).

In an effort to address the struggles of food-insecure populations of color in Ithaca and neighboring towns, black farmer and food justice activist Rafael Aponte and his wife Nandi developed the 10-acre Rocky Acres Community Farm in 2013. Located just south of New York Route 34B, in the small village of Freeville on the outskirts of Ithaca, RACF is a critical farm space within the county’s agricultural scene for black and brown people “who normally aren’t part of that picture, both historically and culturally,” Aponte told me when I interviewed him. “For people of color, that history is full of exploitation and trauma.” The exploitation and trauma Aponte states are directly connected to instances of racial violence toward people of color, sanctioned by systems of domination organized around race, class, food, and agriculture. These systems of domination have penalized and disempowered, for example, black farmers (Green, Green, & Kleiner, 2011) and Native Americans (Norgaard, Reed, & Van Horn, 2011) in the United States, which impacted their respective relationships with land. For black farmers, land historically provided a sense of security that went beyond farming as a means of food security that included

economic security. In the case of Native Americans, land is historically and culturally embedded in the sacred relationship between nature and humans, linked to food provision and land stewardship. However, due to state-sanctioned land dispossession and genocide, some members of these communities now view land cultivation as a source of trauma linked to inequality and slavery (Alkon & Norgaard, 2009; Daniel, 2013; Green, Green, & Kleiner, 2011; Norgaard, Reed, & Van Horn, 2011).

Drawing on this historical understanding of land relations, Aponte converts the farm into a classroom to help communities of color realize and reclaim their own agrarian power in the context of race, history, culture, power, and land. This farm space, moreover, creates an avenue for conversations about the structural barriers and systems that impact access to food while also recovering the often-overlooked history of food and agriculture in communities of color (Bowens, 2015). Recovering this forgotten story, specifically, illuminates how communities of African and Caribbean descent used agricultural knowledge as a form of power in the past to create and sustain community. However, this analysis does not leave out how trauma, exploitation, and inequities have shaped access to food and land in these communities. To address these inequities, Aponte argues that communities must “create an alternative to that system while dismantling [the current food system] that is grinding both people and the planet up.” Aponte links this problem to the capitalistic characteristics of the American food system. “Part of the problem,” he told me, is that we believe and are “so invested in capitalism that we uphold businesses, the concept of being an entrepreneur, having a business, and hold that as a value.”

By linking his critique of the food system to capitalism, Aponte conceptualizes an analysis that sheds light on how the commodification of food is linked to the market mechanism at the center of economic historian Karl Polanyi’s (1957) *The Great Transformation*. This market mechanism is inextricably connected to what I refer to as the dominant U.S. corporate agriculture movement. While many scholars refer to corporate agriculture as a hegemonic market-based structure or regime

(McMichael, 2005), I use the term *movement* to capture the actors of the system who ensure that it is sustained. These actors include agricultural colleges, government agencies, and large transnational agribusiness organizations that support commodity or conventional agriculture (Lyson, 2007). This type of agriculture “is grounded on the belief that the primary objectives of farming should be to produce as much food/fiber as possible for the least cost. It is driven by the twin goals of productivity and efficiency” (Lyson & Guptill 2004, pp. 371-372). As a result, the movement is often criticized by proponents of alternative agriculture for manipulating the factors of production (land, labor, and capital) to meet its goal of efficiency and productivity while ignoring the destructive effects (degradation of the environment, marginalization of small-scale farmers, conventional farming, unhealthy foods, processed foods, and cheap foods) of this process on people and the environment.

The power to facilitate the land conversation in relation to an analysis of inequities and capitalism, moreover, represents Aponte’s ability to exercise his emancipatory food power and his “right to land,” representing what Kerssen and Brent (2017) describe as “land justice—the right of underserved communities and communities of color to access, control, and benefit from land, territory, and resources” (pp. 285–286). The right to land, as the foundation of all farming and agricultural practices, is always a struggle for food justice activists in both urban and rural areas.

While Aponte has multiple enterprises and off-farm income that allow him to be able to maintain the land, he still struggles to address the food needs of low-income communities of color in a place like Tompkins County through RACF. Yet, one of the most important programs developed by RACF is its Harvest Box Program. Started in 2015, the Harvest Box Program is a partnership between Aponte and the Youth Farm Project (YFP) in the nearby town of Danby. Through this program, RACF places community agency and youth development at the center of the farm planning process. As Aponte put it, the program “is about meeting people, more so meeting people where they’re at, giving them control over something that they

should have control over—their food system.” Even before a seed is placed in the ground each year, community participants fill out a brief questionnaire asking them to indicate the types of vegetables they would like the program to produce and the price point at which they would be willing to purchase them. Then their recommendations are integrated into the larger growing plan of the farm alongside staple crops such as collard greens, cabbage, kale, watermelon, and fresh herbs. While all community food needs are not met through this single program, community members are able to choose the types of food they would be willing to purchase in their box.

Each harvest box includes a weekly share of 5–8 pounds (2.3–3.6 kg) of local, fresh, and nutritious foods at US\$12 per box, unlike the community supported agriculture (CSA) model, which provides seasonal shares that are paid for prior to the growing season. Participants can access this program at locations where low-income people and people of color are usually found, such as Pete’s Grocery and Deli, John’s Convenience store, the Southside Community Center, Titus Towers, and McGraw House in downtown Ithaca. For communities outside of Ithaca in the greater Tompkins County area, who lack the infrastructure or transportation to access local fresh foods, the harvest box is also accessible through the YFP’s mobile market stand. By bringing food directly to these communities, Aponte and YFP seek to provide a sense of dignity for participants. This program reflects a type of emancipation from the county’s local food scene which McMichael and Morarji (2010) describe as “not simply about access to resources, but also the terms of access” (p. 240).

As a result, the Harvest Box Program is “not quite a CSA,” but re-imagines how the CSA model can work when community agency is placed at the center. The program enables the community to use its agency in deciding what foods it wants, where it wants to access them, and how much it is willing to pay for it. All funds generated by this program come from “the economic power of the community and based on the principle that everyone should have access to healthy, affordable food of their choosing and have the ability to make decisions on how that food is produced” (Youth Farm

Project, “Harvest Box,” n.d., para. 1). Moreover, the program provides an avenue for low-income people and people of color to actively resist the dominant local food movement in the area, not through direct confrontation, but through alternatives that reflect their needs and realities. In this way, by placing community food needs at the center of the farm and the farm planning process, RACF articulates as a vision and strategy of building emancipatory food power intertwined with a structural understanding of inequality that perpetuates inadequate access to food and agriculture. This vision includes a historical analysis that positions people of color in the context of land relations that provide beneficial outcomes and empowerment.

Conclusion

In this paper, I juxtaposed the cases of FFC and RACF to explore how the dual process of food justice is navigated by black communities in historical and contemporary contexts. This exploration is important given that scholars and activists who work on issues of food justice tend to characterize the movement in the context of oppressive forms of food power while placing the building of emancipatory food power in the periphery. As stated at the outset of this paper, this dual process has origins in the Black Freedom Struggle during the civil rights era and is visible through the work of a small group of black food justice activists today. Both cases presented here illustrate this point. Although FFC was created over 40 years before RACF in a socially and historically distinct context, they share similar attributes in that both created autonomous rural farm spaces for black and other marginalized communities to grow food, resist inequality, and cultivate community agency. To do this, both farms and their programs were supported by community economic power and built on the philosophy of self-determination. Through these cases, I shed light on the analyses and programs at the foundation of both farms that enhance our understanding of emancipatory food power and the dual process of food justice. These analyses and programs focused on a vision and strategy of resistance to power struggles intertwined with a structural understanding of the inequalities that perpetuate inadequate access to

food and agriculture.

Moreover, the FFC and RACF cases enrich our understanding of the dual process of food justice. For example, seeing food justice articulated as a dual process in both cases sheds light on how food is used as an entry point to facilitate a larger agenda of racial justice, self-determination, economic power, and community power. Whether the dual process of food justice is used to enhance the realities of poor black displaced sharecroppers in the 1960s in Sunflower County or today with low-income communities of color in Tompkins County, clearly a food justice agenda uses food as an initial point to understand larger societal issues. Here, this agenda includes the project of reimagining and repositioning the importance of land to the food justice movement. Here, land is not just about access to property or a site to farm, but rather a reimagining of land relations in communities in which inequality has reshaped their view of land. For black communities, specifically, FFC and RACF designed their farm spaces as a way to use land as a form of empowerment. Within this farm space design, issues of race, self-determination, and economic power took center stage in the development of educational and food programs. Their uses of land as a space to both grow food and learn how to resist oppressive forms of food power illuminate how having access to the economic resources to access land can open the door to transforming how certain communities view land. I note that this project of reimagination is not isolated from that of gaining access to land or the necessary resources, political or economic, to obtain it. As Fannie Lou Hamer once said, "Give us food and it will be gone tomorrow. Give us land and the tools to work it and we will feed ourselves forever" (Freedom Farm Corporation, 1973). Here, Hamer suggests that food provision is only a temporary project if communities do not have the resources like land or economic power, which provides a way for us to think about how to sustain the movement going forward.

While this article focused more on the emancipatory component of the dual process of food

justice, future research is needed. For instance, there is a need to explore and expand the analysis of food power and investigate other cases, both historical and contemporary, that could build additional understandings of emancipatory food power. As mentioned at the outset of this paper, this type of food power has been overshadowed by the oppressive forms of food power and neglected by both scholars and activists. Partly as a result, the food justice movement is currently at an impasse (Minkoff-Zern, 2017) and many are actively engaged in conversations about the future of the movement (White, 2017b). Activists such as Aponte, alongside others like Karen Washington of Rise and Root Farm in Upstate NY, Malik Yakini of D-Town Farms in Detroit, and Leah Penniman of Soul Fire Farm in Grafton, NY, are raising "questions about using resources and unearthing missing voices in agriculture" (2017b, p. 21), sociologist Monica White argues. Therefore, to contribute to these conversations, I propose that activists and scholars position an analysis that considers this dual process of food justice at the core of the movement's organizing framework. This dual move related to power gives a way to understand not only contemporary instances of food justice, but also the long history of the movement in marginalized communities, especially black communities in the U.S. Thus, this new way of thinking about food power illustrates the use of food power as an analytic to understand and interpret contemporary and historical instances of food justice; extends narratives of the movement beyond a sole focus on oppressive forms of food power; and provides insights that illuminate the possibilities of the movement in the future to include race, land, self-determination, and economic autonomy.

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“Being stewards of land is our legacy”: Exploring the lived experiences of young black farmers

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Abstract

The oppressive histories of slavery, sharecropping, and discriminatory lending practices contribute to a modern American agricultural landscape where black farmers are underrepresented. While African Americans once made up 14% of the United States’ farmer population, today they only make up 1.4%. Moreover, the American farmer population overall is aging, and currently only 6% of farmers are under the age of 35. Despite these trends indicating decline, a small population of young black farmers is emerging. This qualitative case study aims to explore the experiences of this previously unexamined group of farmers. Participants found autonomy and self-sufficiency in agriculture, and a particular form of empowerment derived from reclaiming land and actively choosing to engage in work their ancestors were forced to do without

pay. Findings from the study have implications for agricultural educators, extension professionals, and policy-makers working to cultivate a more diverse and representative body of American farmers.

Keywords

African American, Agriculture, Black Agrarianism, Black Farmer, Landownership, Young Farmer

Introduction

African Americans have a complicated relationship with American agriculture. For centuries, enslaved African Americans were forced to work the fertile southern soils of the country, often in grueling conditions, for no pay and no promise of even the most basic human rights. After Emancipation, many African Americans continued to work the

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land, either as landowners, or, more commonly, as tenant sharecroppers. Even as the slave-like sharecropping system exploited the labor of African Americans, the number of black-operated¹ farms continued to grow at a staggering rate, with 23% growth between 1900 and 1920 compared to 10.6% for white farmers (Wood & Gilbert, 2000). According to the 1920 U.S. Census, there were approximately 926,000 black farmers that year. After reaching its acme, the number of black farmers began to decline severely. Today, a little over 33,000 black principal operators remain, or 1.4% of the total U.S. farmer population.²

Though the decline of the farmer population is not exclusive to black farmers, their decline has been an exaggerated example of the national trends of the last century. The farming population is an aging and shrinking one, and as farms have consolidated and average farm sizes increased, the individual family farm has become a less viable option for many. Today only 6% of farmers are under the age of 35, and with two-thirds of U.S. farmland set to transition ownership in the next 20 years, the country stands to lose millions of acres of farm production (Ackoff, Bahrenburg, & Shute, 2017).

Over the last century, black farmers have had to tackle a unique set of obstacles that have prevented them from obtaining secure access to land, credit, capital, educational training, and community representation. In 1982, the U.S. Commission on Civil Rights predicted the extinction of black farmers by the year 2000. Despite only making up less than 2% of the total farming population, black farmers have not disappeared, and since the 2007 Census of Agriculture, there has been a 9% increase in the number of black principal operators in the United States compared to a 4% decrease in the number of principal operators of all farms (U.S. Department of Agriculture National Agricultural Statistics Service [USDA NASS], 2014b).

There is very little peer-reviewed research on the experiences and challenges of the next generation of young farmers in the United States. The

most extensive examinations come from the National Young Farmers Coalition, a nonprofit organization that conducted two surveys, in 2011 and 2017, of farmers age 40 and under. Even rarer are investigations into the unique experiences of the young black farmer, a population that is growing but still frequently overlooked and understudied. The aforementioned quantitative data show a small, but important, increase in the number of young black farmers in recent years, but qualitative data is needed to understand why. Who are these young black farmers, and what motivates them to participate in the agricultural system? What attracts them to farming as an occupation? What are their challenges or barriers to entry? What role, if any, does their race play in any of the above? This exploratory qualitative case study is the first of its kind. Guided by the tenets of black agrarianism, this study aims to investigate the attitudes and motivations of young black farmers and give them an opportunity to share their stories. From this research, four primary themes emerged: (1) black farmers felt a combination of both autonomy and a need for community support; (2) they felt empowered through farming, while recognizing the differences between their experiences and their ancestors'; (3) they engaged in diversified production methods; and (4) they faced minimal overt discrimination but felt a lack of representation on top of the obvious challenges of being a young farmer in the modern agricultural age. I hope that the insights provided here open the door for further research into the lives of young and beginning black farmers so that we may continue to cultivate and encourage diversity in our agricultural occupations.

Review of the Literature

Much of the research on black farmers in the last century has focused on the problem of their diminishing numbers. Between 1920 and 1997, there was a 98% decrease in the number of black farmers, compared to an overall decline among white

¹ "African American" and "black" are used interchangeably in the paper, depending upon the word choice of the cited source or research participant.

² This Census figure is based on data for "principal farm operator," defined as the person in charge of everyday operations, not necessarily the landowner.

farmers of 66%, which suggests that black-operated farms decline at a higher rate than white-operated farms regardless of their size (Wood & Gilbert, 2000). The reasons for the falloff are varied and nuanced, and scholars have debated these causes for the better part of a century. Based on the literature, there are several emerging rationales that attempt to explain the incidence of black land loss and the decline in the number of black farmers, including economic hardships as a result of the structural changes in agriculture (Brown, Christy, & Gebremedhin, 1994; Busch & Juska, 1997; Lobao & Meyer, 2001); loss of land through partition sales due to heir property (Dyer & Bailey, 2008; Gilbert, Sharp, & Sindy Felin, 2002; Pennick, Gray, & Thomas, 2007; Wood & Gilbert, 2000; Zabawa, 1991); nonparticipation in government programs (Gordon, Barton, & Adams, 2013; Tyler & Rivers, 2014); and discrimination at the county, state, and federal levels (Havard, 2001; Hinson & Robinson, 2008; Pigford v. Glickman, 1999; Wood & Gilbert, 2000). Additionally, the Great Migration of the 20th century accounted for the exodus of millions of African Americans from the agricultural South to northern cities where the social and economic opportunities were considered more favorable. Early research indicated that African Americans were fleeing the southern states due to agricultural reorganization and the economic hardships of sharecropping (Drake & Cayton, 1962; Frazier, 1939). Scholars declare the mid-1970s as the end of the Great Migration period; by 1980, over four million southern-born African Americans lived outside the region (Tolnay, 2003).

Landownership

Return migration into the South increased after 1970. While many demographic studies at the time were focused on the return migration of southern-born African Americans, a small number of northern-born African Americans were also moving to the South. Falk, Hunt, and Hunt (2004) attribute this migration to three distinct phenomena: (1) political changes in the South that signaled a reckoning with its racist and violent past, (2) familial connection to rural areas where there was potential for landownership, and (3) a cultural understanding of the South as “place.” They

found that the recent southern return migration had made the African American population less northern and less urban, and they believed this reflected a “call to home” factor that has influenced northern African Americans’ decision to return to the land of their ancestors (Falk et al., 2004; Stack, 1996).

For people in rural communities, landownership evokes a certain degree of autonomy and independence (Mooney, 1988; Quisumbing King, Wood, Gilbert, & Sinkewicz, 2018). This sentiment holds equally true for African Americans, whose lives and property for so many years were not their own. Research suggests that owning land provides a bevy of economic, social, political, and cultural benefits for African Americans (Balvanz et al., 2011; Dyer, Bailey, & Van Tran, 2009; Hinson & Robinson, 2008; McCutcheon, 2013; Pennick et al., 2007). In his study of New Deal Resettlement communities, Lester Salamon (1979) found that landownership improved overall community well-being and provided social and economic independence. Similarly, Brown et al. (1994) reported that landownership supports rural economies and contributes to feelings of value and self-worth among black farmers. Stack (1996) asserts that the return migration of northern African Americans back to the South is evidence of the importance of landownership as a symbol of stability.

Black farmers and landowners faced decades of discrimination from their local banks, lending agencies, and the U.S. Department of Agriculture (USDA), jeopardizing their ability to retain land and directly threatening their autonomy and livelihoods (Daniel, 2013; Gilbert et al., 2002). A U.S. district court judge recognized these injustices, and in 1999 the *Pigford v. Glickman* class-action lawsuit allocated approximately US\$1.06 billion to be distributed to black farmers who were affected by these discriminatory practices. Of the almost 23,000 eligible class members, only 15,645 farmers were approved under the Track A process, which provided, among other things, a US\$50,000 payout per farmer. Another case was subsequently filed to account for black farmers who filed late, and this case, commonly referred to as *Pigford II*, settled in 2010 for another US\$1.25 billion. (Cowan & Feder, 2013; *Pigford v. Glickman*, 1999).

Black Agrarianism

The formation of cultural, political, social, and economic values for many rural U.S. citizens stems from a broad agrarian philosophy put forth by Thomas Jefferson in the late 18th century. Jefferson, himself a farmer and slave-owner, promoted a connection between owning property and moral citizenship, with the small family farm representing the ultimate archetype of agrarian ideals. He believed that landownership provided economic independence and the agricultural cultivation of one's land produced strong, industrious citizens and built the foundation for American democracy (Carlisle, 2014; Smith, 2004).

Of course, democratic agrarianism did not apply to African Americans, since they were not, at the time, considered citizens. Instead, there remained a deep-seated yet often overlooked foundational agrarian ideology that underpinned the African American struggle for land acquisition in the United States. Though it shares its roots with the ideals of democratic agrarianism, 'black agrarianism' is something uniquely African American; it has sprung from an opposition to the racist systems of oppression that have permeated rural communities since the first slave was brought to America's shores (Quisumbing King et al., 2018; Reid, 2012). Indeed, there is a long and proud history of black involvement and production in agriculture in the U.S. (Finney, 2014). In her discussion of black agrarianism, Kimberly Smith (2004) frames her argument within the context of democratic agrarianism but notes that the aftermath of slavery and the constant racial oppression made it difficult for black men to establish a relationship with land and, in many instances, made it impossible to secure property rights. Black agrarians insisted that African Americans had more than earned their right to own land.

Booker T. Washington, the first principal of the Tuskegee Institute in Alabama, was a model black agrarian. Washington's vision of an agricultural future for his people was a pragmatic one. He believed that economic empowerment and freedom could only come from the skilled cultivation of the land, and it was the duty of educational institutions like Tuskegee to develop these skills in its black students (Smith, 2004). This emphasis on

self-reliance and economic prosperity through agriculture still exists in black rural communities today, and this can be observed through all-black agrarian settlements like New Communities in southern Georgia, black nationalist farms like Muhammad Farms, and the dozens of cooperatives scattered throughout the South that advocate and provide training for black farmers (McCutcheon, 2013; Siby, 2013).

Because black agrarianism is rooted in the collective experiences of slavery, white supremacy, and systematic discrimination, it has developed into an ideology that not only advocates for the virtues of hard work and self-sufficiency, but it is also a form of territorial liberation. Black landownership and an agrarian lifestyle are means to escape the white-dominated system and affirm one's political and civil rights (Quisumbing King et al., 2018; Reid, 2012). According to Katrina Quisumbing King et al. (2018), black agrarianism is "an emancipatory thrust," and it is related to other projects of social justice, including Black Populism and the civil rights movement. It is through a framework of black agrarianism that we may begin to examine the current state of African Americans in agriculture.

America's Young Farmers

The second body of research relevant to this study examines the aging population of U.S. farmers and the lack of young farmers entering the agricultural workforce. The most recent data from the 2012 Census of Agriculture shows that the average age of the American farmer is 58.3 years and that farmers are retiring at a faster rate than new farmers are entering agriculture. In fact, despite the USDA's near decade-long Beginning Farmer and Rancher Development Program, which is aimed at training and assisting new farmers, there were 20% fewer beginning farmers (farmers who have been farming for 10 years or less) in 2012 than there were in 2007 (USDA NASS, 2014a). While these trends are concerning, the numbers for black farmers are bleaker. Black operators tend to be older than overall operators, with an average age of 61.9 years. Additionally, 42% of black principal operators are 65 years or older while only 3% are under the age of 35, compared with 6% for all operators

nationwide (USDA NASS, 2014b).

Recently, a report released by the National Young Farmers Coalition (NYFC) has offered the most thorough information about the state of young farmers in America. Based on its 2017 survey of 3,000 farmers aged 40 years or under, the NYFC found that land access is the number-one challenge for young farmers and the primary barrier to entry. They found that 60% of young farmers are women, 47% are farm owners, and 67% farm on less than 50 acres (20 hectares). Young farmers also tend to be more interested in sustainable practices, with 75% of respondents choosing to describe their farming practices as “sustainable.” Additionally, 17% of young farmers were certified organic farmers, compared to the national average of just 1%.

Other research has reiterated the challenges for young and beginning farmers, recognizing that while acquiring land and capital are the most serious hurdles, developing attachments to the land and making a living from their farms are also difficulties (Inwood, Clark, & Bean, 2013). Still other literature provides insight into beginning farmer training development and the efficacy of beginner farmer training programs in Virginia (Benson, Niewolny, & Rudd, 2014; Niewolny & Lillard, 2010) and assessments of intergenerational values toward landownership (Pennick et al., 2007).

While the dearth of literature on young farmers is stark, studies examining the experiences of young black farmers are virtually non-existent. There has been some investigation into the experiences of young farmers of color in general, most notably from the National Young Farmers Coalition. Its 2017 report found that young farmers are twice as likely to be farmers of color or indigenous than the national average of all farmers. Even so, research shows that black students are more likely to perceive barriers to participating in agricultural careers and hold more negative attitudes toward agriculture and agricultural occupations (Talbert & Larke, Jr., 1992). Today, the faces of U.S. food producers are neither representative of the diverse U.S. population nor representative of their needs. If black farmers are to persist, and if their voices are to be heard, their numbers must grow and their experiences must be understood. This exploratory

study into the lived experiences of young black farmers sheds light on their motivations, characteristics, and challenges, and aims to serve as a starting point for future research.

Methods

In the spirit of previous qualitative studies on the lived experiences of farmers and attempts by researchers to give a voice to an underrepresented population (Balvanz et al., 2011; Brown & Larson, 1979; Fiskio, Shammin, & Scott, 2016), this exploratory qualitative study sought to explore the nature of the new generation of black agrarians and capture their singular experiences through their own voices. This research design benefits from the case-study approach, which is notable for its in-depth examination of a real-life bounded system, multiple data sources, and an analysis that includes a case description and case themes (Stake, 1995; Yin, 2009). Specifically, I conducted seven semistructured interviews with black farmers in the South and Midwest regions of the U.S. Of those, five were 40 years of age or younger, and they make up the case of young farmers presented in this study. While two farmers fell outside of the bounds of this case, their experiences and observations provided insight into the motivations and challenges of young black farmers. Additional sources of data collected include document analysis and participant observations. The data collection period extended from March 1, 2017, to April 30, 2018.

There is a precedent for this study's sample size in qualitative research examining black farmer populations (Balvanz et al., 2011). Even so, the small sample size and purposive sampling methods associated with this qualitative research do not allow for the development of broad generalizations across this population. The experiences documented by the research are unique to the participant farmers. Despite these limitations, this exploratory study is pertinent and necessary as it introduces a yet unstudied population of young black farmers into the discussion surrounding racial inequities and diverse experiences in agriculture.

Participants

Participants were chosen based on a purposive sampling method. They were recruited at farming

conferences and pursued through personal farming connections. I spent 10 days researching black farmers in the Deep South (Georgia, Alabama, and Mississippi), and during this time I was able to interview and record numerous on-farm observations of both study participants and other knowledgeable individuals within the black farming community. Five self-identified black farmers 40 years of age or younger who farm in the Southern or Midwestern states participated in this study (see Table 1), and these criteria formed the basis of the bounded system.³ Among the participants, three were male, two were female, and all five had at least some college-level education. Two were landowners farming on family land, while the other three planned to begin their search for land to purchase within the next few years.

Data Collection

I contacted the participants individually, on separate occasions, and met each in person at an agreed-upon location. Before our interview, they were briefed on the project and its objectives, informed of the confidentiality information, and provided with a copy of the IRB consent form and

researcher contact information. The same general guiding questions and interview protocol were used for all participants, but due to the semistructured nature of the interviews, questions were altered or added as needed based on the direction of the conversation. In general, participants were interviewed on their background in agriculture, their attraction to farming, the challenges they have faced, the importance of African American involvement in agriculture, and their advice for new black farmers. Interviews lasted from 45 to 90 minutes, and they were audio-recorded and transcribed. All identifying information was removed during the transcription, and pseudonyms were assigned to each participant.

Data Analysis

Initial interview audio was transcribed by hand, coded line-by-line, and together with observation notes and document analyses, an initial set of codes was inductively developed. These codes guided subsequent interview data, and additional codes were added as necessary. In total, the preliminary codebook comprised 51 codes. Content analysis revealed several patterns. Through an iterative

Table 1. Demographics of Participant Farmers

	Robert	Ashley	Malik	Antwon	Rose
Age	26	28	39	40	29
Sex	Male	Female	Male	Male	Female
Region	South	Midwest	Midwest	South	South
Education	B.S., Agriculture	B.A., Architecture	Some college	Some college	B.A., Anthropology
Years Farming	3	1	1	15	5
Farming Employment	Full-time	Part-time	Full-time	Full-time	Full-time
Production Type	Produce, pecans	Produce	Milo, wheat, livestock	Produce, livestock, dairy, row crops	Produce, medicinal herbs
Farming Practices	Non-organic and certified organic	Organic methods (not certified), permaculture	Non-organic, sustainable practices	Non-organic	Organic methods (not certified)
Acreage	1636	5	700	150	2
Generation in Farming	3 rd	1 st	3 rd	4 th	1 st
Current Employment	Farmer at nonprofit	Architect; farmer	Farmer	Farmer	Farmer at nonprofit
Landowner?	No	No	Yes	Yes	No

³ The National Young Farmers Coalition's 2017 survey of young farmers used age 40 as the cut-off to define a young farmer.

process of reviewing transcripts and utilizing code frequency counts, 13 categories emerged from the data, and these categories were grouped into four overarching themes (Patton, 2002; Stake, 1995; Yin, 2003). The four themes identified in this study are discussed in the findings section along with representative quotes from the five participants.

Multiple methods were used to establish the overall trustworthiness of this study (Creswell, 2013). The data were triangulated using analyses from documents, information from the literature, participant observations, member checks, and informal discussions with other black farmers. Both the data and the analysis procedures underwent peer debriefing. Despite a small sample case, my intention is for this exploratory study to lead to further research on the subject and the development of future transferability.

Statement of Positionality

The researcher is the primary instrument in qualitative inquiry, and therefore it is necessary for qualitative researchers to disclose their positionality and potential biases (Creswell, 2013). I am a young black farmer myself, and as such have an obvious personal bias regarding the subject matter and a vested interest in the well-being and success of my fellow young black farmers. Although this personal investment may put me at risk of imparting verification bias on the study and simply using this inquiry to confirm my preconceived beliefs, my identity as a member of this small community granted me unique insights into the lives of the participants. I was the sole interviewer of all participants, and I conducted exclusively in-person interviews to connect with the participants at a more personal level than phone interviews would allow. I remained cognizant of my position within the research throughout the project by keeping memos after each interview and writing reflexive journal entries. I worked to bracket out my own perceptions and to reflect on how my experiences as a young black farmer were similar and different from those of the participants.

Results

Following a thorough analysis of the data, four themes emerged: (1) Concurrence of Autonomy

and Community Support; (2) From Struggle to Empowerment; (3) Innovative, Diversified Production; and (4) The Emerging Face of Young Black Farmers. Discussions of various categories within each theme as well as relevant quotes from participants are presented below.

Concurrence of Autonomy and Community Support

Throughout our discussions, an intriguing paradox emerged between the farmers' desire for independence and their need for connection to a community and a support system. When asked what they loved about being a farmer, four of the five participants identified the ability to be one's own boss as a primary benefit to farming. Even Robert, who worked for a nonprofit farm and consequently had a boss, found freedom in the farm life, stating, "pretty much, you're your own boss. You wake up every morning, you make your own schedule. ... Out here, being a farmer, it's more freedom; you make your own decisions." This notion of the importance of autonomy was often reiterated. For Malik, farming was not just a job; it was a lifestyle that he was proud of and found more worthwhile than working a job with the sole goal of making ends meet:

Working for the man, it's like, there was no purpose. It was just to make sure my bills were paid, keep a roof over my head, and do the same thing the next day, you know? I have the opportunity to do something, so I have to take advantage of it. ... what's it say? With great power comes great responsibility?

In Antwon's view, farming was a way to fulfill his entrepreneurial goals and provide for his family without having to report to anyone or split his pay with anyone. For him, the benefits were obvious: why would he want to make money for someone else when he can make it for himself?

You know, we can make our own money individually and they out here working 8–12 hours for a factory, and you go do 10–12 hours on the farm and make just as much money, less of a headache, and you're your own boss.

Autonomy and the freedom from working for others were motivations for these participant farmers, but if autonomy is the freedom to determine one's actions, then self-sufficiency goes one step further and allows for the provision of one's resources without dependence on others. To Robert, self-sufficiency on the farm meant being able to learn a wide variety of skills and take care of problems as they arose without the need to spend money on off-farm assistance. At the farm he worked on, a five-person crew was in charge of managing all aspects of the farm, including tractor maintenance and care. With a bit of pride, Robert said, "I came into it as a farmer, but I'm leaving as a mechanic, a carpenter, everything. It's hard work, but a lot of the stuff we do here is on our own, learning, which is good."

Ashley differentiated between the importance of autonomy and self-sufficiency, stating "even if you have autonomy, you can do whatever you want... that's great and all, but you know, what happens if you need food and there's no grocery store anymore?" While autonomy may logically serve as a prerequisite for self-sufficiency, Ashley framed self-sufficiency as an empowering state of personal caretaking. She emphasized that growing her own food was taking care of herself, and said, "if we forget how to take care of ourselves, we're then dependent on someone else who may or may not know how to take care of us." She had a general distrust of those who would attempt to misinform or take advantage of her and saw dire consequences in not being adequately skilled in growing food, "because if everything goes to shit, or if everything kind of falls apart, am I really able to restart?"

Rose, a vegetarian, started farming as a way to increase her access to fresh fruits and vegetables and to be an example of self-sufficiency for her children. She saw farming and gardening as tools for educating her community about taking back control of their health and their bodies. She added, "I think as African American people, it's really important for us to have agency over our food and our food system because if you don't have control over your food, people can control your whole life, I think."

Even as all participants espoused the virtues of

autonomy and self-sufficiency and cited them as motivations for their farming careers, they by no means desired isolation. Participants emphasized the importance of having experienced mentors, a support system composed of other black farmers, and a strong connection to community. Antwon remarked that having other people on the farm was key, as farming is not something one can do alone. For Malik, creating friendships with his neighbors was the best way to learn about different practices he was interested in adding to his farm, like cover cropping and buffalo production.

Rose worked and lived in an urban community, and the black support system she had amassed was very important to her, especially in a field dominated by white men. She said:

I think I'm lucky that there is a really strong network of black people who are doing work around food access. I feel like I'm very supported and have a very strong community. I don't even really have to interact with white people. [laughs]

On the other hand, Ashley lived in a predominantly white area of her state, and she struggled with the lack of a black community nearby. She emphasized the importance of having other African Americans around her, saying, "When you are black and identify as black, and then you learn what it means to be black, it becomes increasingly important to be connected with people that get it, and that can feel you, you know?"

Finally, participants felt their roles as farmers also gave them the opportunity to give back to members of their community. Ashley acknowledged the difficulties black people have faced over the centuries and saw her role in the community as an educator, stating:

I think providing the tools and the knowledge and sharing the information that's necessary so that people can be self-empowered to take care of themselves is paramount. That's more important to me than just growing something and providing that to them. I think knowledge is the greatest power and tool that we can share with each other ... the key to the gates

of liberation is knowing what to do and how to do it.

From Struggle to Empowerment

Centuries of slavery, racism, and exploitation forced many African Americans into an agrarian life for the benefit of American agriculture. Subsequently, many were pushed off of the land and left the South to start more viable and lucrative lives in cities across the country. Rose saw a marked lack of African Americans in agriculture and attributed this to two things:

I really think it's because of our history of being systematically discriminated against and pushed off of our land. And then, also, the negative ideas we have around agriculture. ... I think there's some shame in it because of being enslaved.

For these participants, a recurring theme was a discernable transition from viewing farming as oppressive and representative of struggle to a worthwhile and fulfilling career. Unlike their ancestors, these participant farmers made an active choice to pursue farming, and they were all pleased with their choice. Participants saw farming as a joy, an occupation that they loved and would not have traded for anything else. Robert joked about getting to have a truck as one of the perks of being a farmer, while Antwon summed up his feelings this way:

I can't name one thing I DON'T love about being a farmer. I love it all. Just, the outdoors, the weather, the environment, the peace, the rush, the growth, the struggles, the successes. It's not a dull moment. Every day is different. I mean, really every day, every MOMENT is different on the farm.

Rose echoed a similar sentiment, stating:

Um, I just love plants! I love them. I think they're amazing and I think that they are really healing. Working with the land is really healing and it's energizing, and it's fun, and I love educating people, I love eating the food,

seeing people eat the food. ... I just, I love everything about it.

For Malik, his chosen path was dictated by his spirituality, and he felt called to do the work he was doing: "I'm really just glad to be able to do it. Obviously, this is what the Lord wanted me to do, so I'm glad I'm getting that opportunity to do it. And I just hope I do it well."

Beneath the overarching theme of empowerment emerged a specific connection to agriculture by way of African or African American ancestors. Ashley did not grow up on a farm, and she admitted that she had little experience with farming or gardening. She remembered her grandmother's garden patch behind her house, although gardening was "never a thing that [my grandmother and I] did together." Even so, she described being involved in agriculture as something that just felt right:

There's some things that just kind of click, you know. ... It's just like, you start doing something and it's just like, oh yeah! It's like remembering. And so ... it's like a segue or conduit to kind of remembering who we once were as a people.

Rose recognized a deep detachment from the land within her black community and she believed that reconnecting to agriculture meant reconnecting with her cultural heritage and her ancestors, saying, "I think there is a lot of pain that we have associated with the land and that by reconnecting with it that we can really heal a lot of that generational trauma that we have." In Malik's family, farming and landownership have always been points of pride, and his family was successful in their endeavors. He returned to the family farm to take it over because he felt it was his duty, saying, "It's just too many years of blood, sweat, and tears that's gone into that farm for me to just let it go. No one else can do it, I mean, I'm the only one left."

This concept of a natural inclination toward agriculture was expressed throughout many of my discussions with participants. Antwon saw farming as something "that has been in our African American bloodline since ... day one I guess you could

say.” Robert saw himself as an extension of his family, all of whom worked on farms when he was younger. Because he spent his life around farms, he was drawn to the work, saying “I knew that I had it in me, you know, as far as how to grow, when to grow.” It seems he not only had a familial connection to agriculture, but also a deeper-seated, ancestral connection that he believed was just a part of who he is. He spoke of a conversation he had with a student:

Back in the day of slavery, black people did all the work to the land and the master, you probably ask him a question he wouldn't be able to tell you. I said, the world ain't changed. I said, now in this age, we should be owning farms, owning land, but people don't know that the people that actually farm the best are the people that did it back in the day. You know, so I was saying, it kind of comes naturally to me, you know, because I feel like it was already in my blood. Past family already did it, and they knew how to do it, so it's like you born with that, that, that good gene, you know?

For these farmers, what was once a source of hardship and oppression became a symbol of empowerment in which they were able to learn skills of self-sufficiency, develop a work ethic, and escape the control of society over their livelihoods. More than that, though, farming had emancipatory value as both a connection to an ancestral past and as a reclamation of what was once a forced burden. Ashley summed this up well, saying,

Because you're not a slave, that's EXACTLY why you should farm. Because, I mean, take care of yourself. Like, because you can, because you are not chained up. You have access to whatever knowledge and information you want to have.

Innovative, Diversified Production

Every farmer participating in the study was engaged in some form of diversified production, in contrast to much of the American agricultural landscape today. Malik operated 700 acres (283

hectares), which were made up of a mix of milo, wheat, and livestock pastureland. Rose worked for an urban nonprofit farm where she grew a variety of produce and medicinal herbs. Ashley's farm was new and unplanted at the time of the study, but her plans included planting an orchard and using permaculture design to grow perennial vegetables. Antwon managed the diverse operations of his family farm: he ran beef cattle, raised hogs, grew produce, and operated a dairy, all on his 150-acre (61-ha) farm. Finally, Robert oversaw a 1,636-acre (662-ha) former plantation turned nonprofit that had invested in everything from a 200-acre (81-ha) pecan grove to certified organic vegetable and wine grape production.

All participants also underscored the importance of working outside the bounds of traditional agriculture to set themselves apart from competitors, utilizing innovative marketing strategies and production methods. For some of the farmers, these tactics stemmed from a sense of ecological responsibility and land stewardship. Malik had recently learned a new technique to apply to his farm, saying:

I've been talking to these people about the cover crops. And I'm like, why doesn't everyone jump on this? I mean, it's so ... it makes so much sense. It's like, you're protecting the land, you're keeping weeds out, and you're making nutrients, and all that and moisture stay in there, so why wouldn't people do that? I don't see a lot of that being done where I'm at. So ... yeah, I'm ready to think outside the box. Got to these days.

Ashley imagined her farm as a space of mutual care, where her sustainable practices nourished the land and the land in return revitalized her:

I love connecting with the bees and butterflies and developing a whole new relationship with nature and all of its little components. I mean, that was a really powerful experience that I've had working on a farm, is ... understanding the different types of relationships that we can have with non-human creatures.

For other participants, diversification and innovation were essential to the financial viability of their operations. Antwon and his family were tobacco farmers for several generations until recently, when it became no longer profitable. Antwon then directed his energies toward coming up with new ways to sell his products. At the time of the study, he had just started a door-to-door produce delivery service and had begun to create some value-added items from his meat and produce. He said:

We always have these unique ideas and ways to set ourselves different from everybody else's product or whatever ... We started selling pork chops, brats, and value-added meats that we had on the farm. And four to five months after that, everybody at the market started selling pork chops, brats, same thing we selling. And then we would see them peeking around corners, looking at our prices, trying to be competitive and everything.

Robert's feelings on land stewardship and sustainability emerged as he talked extensively about the organic and sustainable practices of the large farm where he worked and the farm he worked on in college. For him, organic production was important for several reasons, including eating healthy, battling obesity in America, and capitalizing on an expanding organic market, stating, "I know organic is going to blow up real soon, so if I can get the jump on it..." He asserted that conventional sprays for vegetables could be harmful and unhealthy, and, as a farmer, he wanted to educate people on their food choices, saying, "It starts in the ground. What is spread on the grass that the cows eat. What are you feeding the cow, you know? If you know all these things, you'll look at the way you eat a little different." He also saw being organic as a way to connect and interact positively with his plants and the land. He said, "If you're a farmer and you don't have a relationship with your plants, organic is not for you. If you can't walk out there and like seeing your stuff grow, organic is not for you."

The Face of Young Black Farmers

All participants had much to say on the topic of the next generation of black farmers. Many of them recognized the obvious shortage of other black farmers, especially farmers under 40, in their communities. Ashley and I were able to commiserate about the absence of black farmers in the Midwest. When talking with me about other black farmers she knew, she said, "Um, you're probably the first person, even though we were not farming together. When I saw you [at our friend's farm], I was like, oh, there's a black person!"

Robert attributed the shortage of black farmers to the childhood memories of hard work growing up on a farm and the desire to pursue another profession, saying:

Growing up ... you working in the field as a child, and it's tiring, you know? I don't wanna be out here, I'm sweating. Your hands are picking cucumbers, and picking okra, you don't know why you itching that much. ... Growing up having to do that, [young people] get older and as soon as they get a chance to go out, they do.

Robert admitted that his own father and grandfather did not like farming and did not want anything to do with it. Today, he said, "everywhere I go, I'm the youngest. If somebody's farming, either the dad owns the farm or it's in the family. ... I haven't seen a black farmer younger than 35 actually." In Antwon's opinion, there were few young black farmers because agricultural programs like 4-H and FFA were predominantly white and were not working to attract people of color, much like his own experience in high school. Additionally, he thought young people did not consider agriculture to be a lucrative career. Giving an example of his own childhood growing up on a farm, he said, "We never saw the money flow, the cash flow, never saw the income. We always heard about bills, bills. We never seen fun times."

While the overall decline of the black farmer population in the 20th century has been attributed to discrimination and racism, these young farmers, unlike previous generations, did not believe they face racial discrimination on par with their

predecessors. Instead, they believed their status as *young* farmers was the determining factor of their respective barriers to entry. Much like their white peers, they cited issues like land access, access to capital, and financial constraints as their primary challenges. For Malik, it was debt that was holding him back:

I can't think about anything but this debt. I mean, let's just be real. You know, it's hard for me to really focus on anything but that, but I think once that is finally taken care of to a point where we can take a breath again, I think it'll be better, and I'll be able to be a little more comfortable with what I'm doing.

Ashley thought access to land and capital were the biggest barriers for young farmers, and Rose reiterated this, saying, "Land access. You know, that's something that, I think a lot of people are struggling with right now. It feels very daunting."

Robert, who farmed in the Deep South, said, "I haven't seen any real challenges as far as discrimination and all that. ... I mean, you get looks ... [but that's] people just not understanding why you are in this business. For me, being young, I don't really face any challenges." Antwon, also a southern farmer, felt similarly about his experiences:

It seems like the dairy community family is a totally different family. All they worrying about is making sure their family survive, if we all gonna make money. You know, race doesn't play an issue with them. I mean it's never even brought up really. You know, you walk in and they start talking to you, the main thing they wanna know is if you a dairy farmer. Once you say yeah, you already got the bond.

Malik noticed subtle looks from people but did not believe he had dealt with any racial discrimination in his community. He said,

I haven't really experienced anything based on, you know, really just based on my race. I mean, you got the old white ladies once in a

while wanna give you a side-eye, but other than that, I mean, I don't really have to deal with that.

In Ashley's experience, her interactions with the white farming community had been mostly positive. The farmers she knew were small-scale, diversified in their production, and, as she described them, white but open-minded and liberal. She did mention feeling unwelcome at times within her rural community, and when asked to describe what she meant, she said:

It's always very subtle. A good example which has happened many a time, not necessarily in farming, but it does kind of typify the instances where I don't feel welcome, is not being acknowledged, not being looked at as a part of a group. ... It's like, I'm not invisible, right?

This lack of black representation within the farming community was a common thread among the participants. Antwon, who served on the board of the Dairy Farmers of America, said that he had to make comments to other board members about the lack of diversity in their advertising, saying "every time you show a commercial, you don't show the true color of agriculture. If you don't show that, then our youth will never know." For Robert, his principal concern with white peers was an inability to effectively communicate with them because he was not one of them. He said,

The challenge is the lack of knowledge that I can get from other farmers. The disadvantage to me is, they don't have that conversation with me like they would with other people. So, I have to put myself in places and predicaments where I know I'm not comfortable in, just to get a lick of knowledge or something.

Rose attended a farming conference and noticed right away the lack of people of color. She believed that farmers of color must create a space for themselves and come together to network and talk about their work. She explained her disgruntlement this way:

It is very disheartening when it feels like the things that impact us as people of color are not on the larger stage and we don't necessarily have representation. And so that's what I think impacts me the most is really just wanting to see more people like me or like us doing this work and hearing about their stories and, yeah. Just knowing that we have a platform and an opportunity.

Nevertheless, she was optimistic. She said:

[There is] a new generation of young black people who are recognizing that it's important for us to have this profession and are trying to get back to it, I think. ... There is an open space that I think we can really take advantage of right now and be leaders within it because it feels like more and more people are valuing what we have to say and our stories and are seeing more of the benefits of letting people of color have agency over their own community and over the work within their own communities.

Discussion

This research makes an important contribution to the study of black agrarianism in that it is among the first to examine a young black farmer population. As a qualitative case study, these findings are limited to this specific bounded case and the participants therein. However, transferable lessons can be drawn that apply to broader populations of young farmers of color. Many of the findings were consistent with those found in previous research about black farmers. Much like the older generations, these young black farmers tended to farm on smaller parcels of land and engage in more diversified production compared to their white peers (Brown & Larson, 1979; Pennick et al., 2007; USDA NASS, 2014b). Landownership as a source of power and self-sufficiency emerged as a theme from this study, which is consistent with previous literature (Dyer et al., 2009; Hinson & Robinson, 2008; Quisumbing King et al., 2018). Notions of connection to land, independence, and self-sufficiency as food-producing citizens track with ideals held by black agrarians. As black agrarianism

suggests, these participants farmed in order to care for the land, provide knowledge and resources to their communities, and maintain resilient links between their people, their history, and place (Quisumbing King et al., 2018; Smith, 2004). Interestingly, this theme emerged even in conversations with participants who did not yet own their own land but hoped to soon, indicating the pervasiveness of the notion that land equals power in the black community. The paradox between autonomy and community support is telling of a population of farmers who both value their autonomy—as a way to protect themselves from the dependence on an American society that once deemed them sub-human—and a desire for social cohesion through a supportive and informative community. Despite the general consistency between this research and prior black agrarianism research, the findings from this study diverged from black agrarianism's political and activist emphasis. Participants were motivated to take care of themselves, their families, and their communities, but they did not necessarily see their involvement in agriculture as an explicitly political act.

Perhaps the most marked diversion from previous scholarship on black farmer populations was the lack of explicit discrimination, racism, or oppression experienced by participants (Balvanz et al., 2011; Daniel, 2013; Gilbert et al., 2002). Though we certainly cannot extrapolate to say that racism and discrimination against African Americans is no longer a problem in agriculture, it is noteworthy that these concerns were not at the forefront of the minds of these young black farmers. It is easy to observe the racism in agriculture through instances like the *Pigford* case, but that search for explicit racism obscures the underlying concerns of these young black farmers. Just because these farmers felt that they had not faced explicit discrimination does not mean that they did not face other barriers or feel uncomfortable in agricultural spaces. While their ancestors may have been denied loans from the USDA or faced other overt forms of oppression, these participants were living in the era of micro-aggressions, in which their race-based concerns centered on more subtle issues such as a lack of representation in the agriculture industry or encounters with implicit bias. In

terms of barriers to success in agriculture, participants' worries were not racially focused, but reminiscent of the concerns of young farmers across the country (Ackoff et al., 2017; Benson et al., 2014). Participants worried about debt, about being able to afford and acquire land, and about gaining access to the training and resources they needed to be successful. They did not believe their race was a barrier, beyond simply making them a bit of an anomaly in their agricultural communities, but they did believe that factors such as being young or not being born into farm families were hindrances to their ability to be successful in agriculture.

Conclusion

By proposing themes that serve as a framework for understanding the lives of young black farmers, this exploratory case study serves as the basis for future research into this understudied population. Although the participants engaged in varying types of agriculture, brought diverse backgrounds to the study, and expressed unique motivations as farmers, they were unified by a shared commitment to self-sufficiency and autonomy, benefited from the support of their community, and felt empowered by the prospect of owning land and feeding themselves.

The shadows of slavery and discrimination hang over American agriculture, yet the experiences of these participants demonstrate that there is more to the story of the modern black farmer. Agricultural educators, extension professionals, policy-makers, and researchers alike must consider the emancipatory elements of agriculture when working with or recruiting young African Ameri-

cans into agriculture. If we are to continue to build new and refine current programs aimed at recruiting a more diverse group of people, and particularly young people, into the agricultural field, we must understand their motivations, needs, and challenges in order to properly tailor assistance.

Further research into the experiences of young black farmers is needed and warranted. All participants in this study farmed on diversified operations, so future studies may benefit from the inclusion of agricultural perspectives that represent more conventional systems of agriculture. Additional research could include a mixed-methods approach that integrates quantitative survey data on the diverse population young farmers to create a more comprehensive picture of their challenges and motivations. As researchers and practitioners work toward creating a just and equitable food system that is as diverse as the country's population, studies like this one are invaluable. The face of agriculture in this country is changing, and we must be equipped with the tools to support and recruit new farmers, including understanding their potential motivations and hardships. 

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What can be: Stakeholder perspectives for a sustainable food system

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Abstract

Any multistakeholder initiative that aims to build the basis for change in a food system, regardless of geographic scale, requires an understanding of what is important to stakeholders, how they view the boundaries of the system, and what changes they feel are needed. An assessment of stakeholder perspectives of the Phoenix Valley food system was conducted as an initial step in a process of food system coalition-building. The objectives of the research were to explore how active participants in the food system visualized a “sustainable food system” and to juxtapose their perspectives on food system sustainability with those in the academic literature to create an initial picture of food sustainability. Respondents emphasized the importance of education, local food, reducing

corporate power, and a strong desire to build a sense of community to better serve vulnerable communities. Nevertheless, the responses also revealed the difficulty of conceptualizing food system boundaries for intervention and the conflation of realist and idealist perspectives on what food systems are or could be. Stakeholders placed considerable weight on localism and the power of education and “demand constraint” on improving food system outcomes, while also attributing the root cause of Phoenix’s problems to broader-scale structural factors that were outside of their control or capacity to influence. This case study describes the potential utility of conducting such preliminary

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assessments in other cities, allowing stakeholders to reflect on their interests, agency, and capacities in the food system space prior to any efforts to build consensus and take collective action. We argue that this process is a crucial first step in any work on building alternative food systems, as it allows hidden areas of contestation (beliefs, values, goals) to arise. This enables participants to begin addressing differences and fostering trust, cooperation, and inclusiveness—thus ensuring the longevity of the coalition or group.

Keywords

Agri-food Movements, Food Assessment, Food System Planning, Local Food, Phoenix Valley, Stakeholder Perspectives

Introduction

The growing disenfranchisement and dissatisfaction of the current state of production systems, augmenting environmental degradation and increasing socio-economic inequality, have resulted in a call to action across cities in the Northern hemisphere. The right to culturally appropriate, just, and sustainably produced food has become the pennant of individuals and groups seeking to transform local food systems and to decrease their dependence on a highly globalized and unsustainable food system. Those engaged in food system planning across multiple scales, from local, regional, and national to global, have emphasized a range of central challenges and concerns for food system sustainability. These include climatic uncertainties, environmental degradation, social inequality, and the commodification of food (Foley et al., 2011; Godfray et al., 2010; Horlings & Marsden, 2011; Tilman, Cassman, Matson, Naylor, & Polasky, 2002). While there is a general consensus on the need for change from diverse perspectives, there is often less agreement over what issues should be prioritized for intervention (Eakin et al., 2016; Holt-Giménez & Shattuck, 2011). The complex set of actors and activities that make up food systems at different scales and places, and the disparate meanings and values associated with the food system, make consensus nearly impossible along the appropriate pathways for improving food sustainability (Block et al., 2008). Any effort to

improve food system sustainability must confront sustainability as a normative, value-laden concern, the idea that sustainability is based in both individual and collective ideas about what *should* be done and what the “ideal state” of the world should be. Assessments of sustainability need to grapple directly with the fundamental uncertainties that exist about what to sustain and thus where to focus interventions. These uncertainties are in part derived from the fact that different worldviews and values held by diverse individuals and groups will result in the prioritization of different aspects of system dynamics (Barthel, Parker, & Ernstson, 2013; Block et al., 2011; Eakin et al., 2016).

Miller et al. (2014) argue that inquiry into the values that undergird sustainability initiatives is largely absent in sustainability science research and practice. They argue that making values explicit in sustainability transitions is critical for the effective societal deliberation of desired states, saying that “sustainability science research into the role of values in societal actions must be moved upstream in the research process” (Miller et al., 2014, p. 241). Sustainability science scholars have illustrated the importance of mapping out stakeholder perspectives in sustainability assessments and enhancing participation, not only to provide clarity in terms of visions and priorities, but also to highlight potential areas of conflict that may impede policy implementation (Reed et al., 2009; Spangenberg, 2011; van Kerkhoff & Lebel, 2006). Such assessments can help illustrate gaps, assets, and opportunities in the food system. These assessments can enable food policy councils and coalitions (multistakeholder organizations formed at the local city or county level to inform local food policy) to more effectively meet stakeholders’ needs. They can also serve as a baseline from which to measure the impacts that food policy councils have over time (Campbell, 2004; Harper, Alkon, Shattuck, Holt-Giménez, & Lambrick, 2009; Pothukuchi & Kaufman, 1999). Ensuring dialogue and cooperation between those who produce knowledge and those who use it enhances the probability of success (Ingram et al., 2010). Stakeholder perspectives can also help illuminate the structure and fragility of the local food system, as well as help determine the individuals and organizations who

play essential roles. The research presented here aims to help solidify what others have previously stated: that stakeholder participation is crucial in developing sustainable food systems because it provides a means for articulating conflicting perspectives, allows an exploration of the implications of such differences, and ultimately leads to a greater understanding (Pothukuchi & Kaufman, 1999; Poulsen & Spiker, 2014).

Urban centers are becoming arenas of both food system contestation and innovation in which varying viewpoints seek to effect change and set the ground rules for food system organization. Although there is a growing interest in and literature on local and sustainable food system alternatives, there is a gap in the literature as to how these movements and/or processes begin to emerge and become active organizations capable of enacting local change (Bedore, 2014; Raja, Picard, Baek, & Delgado, 2014). This case study focuses on the beginning stages of developing a food coalition or food policy council. This step could be argued as fundamental to building a sustainable local food system. Here we present the results of an effort to provide a group of highly engaged stakeholders¹ with an initial assessment of the diversity of perspectives and associated values held by food system actors. Our aim was to make the disparate perspectives on food system sustainability more visible in the planning process. At the time the research was conducted, these individuals were in the early stages of forming an organized food system coalition; no formal processes had been established (bylaws, values, mission, and vision), but a small group of food system leaders had emerged and was seeking funding for the formation of a food policy organization. Our analysis is based on qualitative semistructured interviews with different actors in the Phoenix metropolitan area, focused on individual perceptions of the food system and its sustainability. The results highlight issues of agreement and potential avenues for intervention, as well as areas of significant ambi-

guity—areas that may ultimately create challenges for effective food governance. Specifically, the study reveals a potential disconnect among stakeholders in terms of where they perceive that power is held within the food system, where they see their own agency in driving change, and what actions they feel are most significant to the goal of effecting food system change in the Phoenix Valley. We argue that making the landscape of stakeholder perspectives visible in these processes is an important first step in food system transformation.

Setting the Table: A Conceptual Framework

Moving a food system onto a more sustainable pathway is essentially a challenge of governance and decision-making. In 2014, when these interviews were conducted, a group of highly involved individuals, representing all sectors of the food system, came together to discuss issues of emerging interest and potential localized solutions. The group has since officially formed the Maricopa County Food System Coalition, a small and active entity focused on four core values: (1) creating equal access to quality, affordable, and culturally appropriate food; (2) supporting the physical, mental health and well-being of all residents of Maricopa; (3) conducting responsible stewardship of natural resources, particularly of the unique desert ecology; and (4) empowering the community, embracing cultural diversity, and driving a vibrant economy forward. Forming a food system coalition delineates a space for social participation and action in which diverse actors can collectively define shared goals in order to enact local change.

In our analysis, we draw from Ostrom's (2011) Institutional Analysis and Development Framework (IAD) and Sabatier's (1988) Advocacy Coalition Framework (ACF) to explore stakeholders' perceptions and attitudes in the early stages of constructing the food policy coalition. These frameworks share an interest in collective action and institutional development, and have long been viewed as complementary (Cairney & Heikkilä,

¹ Since the research was conducted, a group of concerned and highly active Phoenix residents have created the Maricopa County Food System Coalition. They hold monthly meetings to discuss the current food issues in the metropolitan area, to build trust within active members and create a space where all perspectives are heard and respected. The coalition is now undertaking a formal food system assessment.

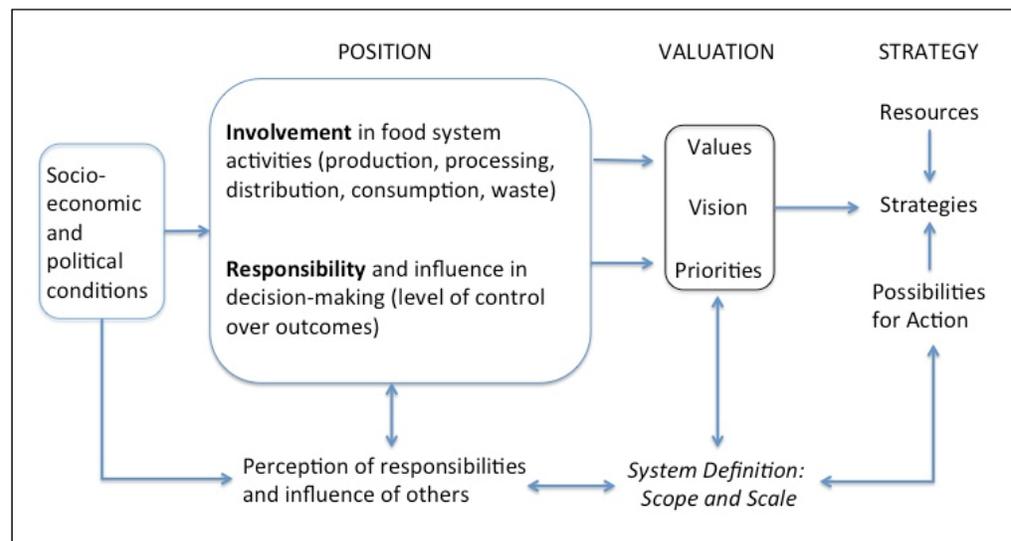
2014). The ACF focuses on how policy coalitions change and learn. In particular, the ACF focuses on the beliefs that actors bring to such coalitions as they evolve (Sabatier, 1988). Sabatier’s ACF posits that stakeholders form coalitions to influence a policy process via three fundamental belief systems that vary in degree of intensity: there are those who share a “deep normative core” (i.e., the hardest beliefs to change, reflecting an underlying personal philosophy), those with a “near policy core” (i.e., those based on causal perceptions and basic strategies on how to achieve a given goal), and those with “secondary (alternative) aspects” (i.e., the easiest of the three to change, those that can be redefined according to new information) (Jenkins-Smith & Sabatier, 1994; Sabatier, 1988). While a belief system will be affected by external factors (e.g., social and political changes), policy coalitions will tend to engage in “an ongoing process of search and adaptation motivated by the desire [of coalition members] to realize core policy beliefs. When confronted with constraints or opportunities, actors attempt to respond in a manner which is consistent with their core” (Sabatier, 1988, p. 151).

In contrast, the IAD focuses more explicitly on the “action situation”—the space in which diverse actors come together to form rules that will govern their collective activities. The IAD places less emphasis on belief structures, but acknowledges the influence of the attributes of actors who are participating in institutional development: their societal positions (the roles and responsibilities affecting their ability to influ-

ence change), their livelihood activities (and thus relationship to others and the resource base) and their world-views (a construct similar to that of “deep core beliefs” in the ACF) (Ostrom, 2011). Both frameworks acknowledge similar elements in policy processes: the attributes and/or values of individuals and communities, the relationship of actors to resources (knowledge and social networks), social location (geophysical and socio-economic), and the rules and norms that govern interactions (Barthel et al., 2013; Block et al., 2008; Block, Chávez, Allen, & Ramirez, 2012; Born & Purcell, 2006; Cairney & Heikkila, 2014; Carolan, 2006; Colding et al., 2013; Holloway et al., 2010). We present a composite framework in Figure 1.

As posited by the ACF, the policy core and secondary or “alternative” belief structures of the individuals participating in a coalition are instrumental to how individuals ascribe to policy positions and strategies. These beliefs may be particularly relevant to how individuals will participate initially in a food policy coalition context given that they will inform ideas about what specific strategies and approaches are appropriate to change the food system. There is some research that provides the basis for hypothesizing what policy core beliefs the actors in the Maricopa food system might have, ranging from more conventional to more radical

Figure 1. Conceptual Framework of the Factors Influencing Stakeholder Perceptions of Sustainability Goals



Note: Informed by Garnett, 2014; Ostrom, 2011; and Sabatier, 1988.

ideas (e.g., Garnett, 2014; Holtz-Giménez & Shattuck, 2011). Garnett (2014), for example, found that stakeholders' approaches to food system sustainability typically emphasize one of three different aspects of change, reflecting their differing values and priorities: efficiency, demand restraint, or food system transformation. Efficiency-oriented viewpoints support the idea that food sustainability issues can be addressed through technological innovation. Here the responsibility is placed on producers and supply chain managers to utilize environmentally friendly practices and techniques; the perception is that the problem originates from the misuse of scarce resources and that significant improvements can be made through improved management. In contrast, demand-restraint perspectives shift the "power to the people" through an appeal to conscience, hoping consumers will halt excessive consumption and will opt to buy food products that have a "low impact." Finally, those arguing for food system transformation—what Holt-Giménez and Shattuck (2011) would characterize as a more radical position—posit that the problem is not about consumer choice or lack of technological advances alone, but rather of structural imbalances in the food system. This perspective sets forward the idea that environmental sustainability can only be achieved through structural changes. Each approach embodies a different "policy core" and secondary beliefs concerning the scale and scope of action needed. They also reflect different attitudes about the distribution of responsibilities for change and the food system activities that are most critical in driving sustainability outcomes.

As described in further detail below, our results illustrate that each of these diverse perspectives was present among stakeholders in the Phoenix metropolitan area; these general ideas about strategies for change are associated with differential perspectives on the locus of responsibility, different understandings about the scope and scale of the food system as a system, and the individual beliefs of particular actors. We use interview data to identify stakeholders' priorities and values associated with the food system; their perspectives on food system definitions and boundaries; and their specific ideas about entry

points to food system transformation. This qualitative overview highlights opportunities for synergistic solutions as well as the complex tradeoffs that must be addressed to create and maintain sustainable food practices in the Phoenix Valley and elsewhere. Our aim is for this research to inform policymakers, organizations, activists, community leaders, and scholars who strive to engage the public in food system discussion and positive, sustainable change. Actors may use the information presented in this analysis to evaluate potential areas of conflict or issues of emerging consensus and as a means of understanding what concerns and issues motivate individuals to shape the food system.

Methods

Identification of Participants

On the premise that one's position and responsibility in food system activities at least partially informs one's values and priorities, we focused on individuals who self-identified (i.e., by volunteering to help organize the food policy work in Maricopa County), or were identified by others, as active in the Phoenix Valley food system. By purposely inviting individuals who are involved in different food system activities (see Ericksen, 2007, for a description of key food system activity domains), we intended to cover a range of *positions* and *responsibilities* that would likely influence differences in values, priorities, and ultimately normative ideas about policy strategies. Following Kloppenburg et al. (2000), our premise is that these individuals largely "account for most of the activity in the ongoing effort to transform our food systems. A definition of food system sustainability that fails to take their perspectives and standpoints into account is incomplete" (p. 180).

A list of active individuals participating in the initial meetings of the food group that later evolved into the food policy coalition was obtained from the group organizers. The list consisted of 79 stakeholders. Initially, those listed without an email and phone number were removed from the potential pool of interviewees. Those remaining were then stratified into categories based on individual self-identified roles (based on career fields or self-

identified community involvement) within the food system (e.g., chefs, council officials, urban farmers, business owners, activists, farmers market organizers, nonprofit organizations, extension agents, and food bank representatives). Once grouped by categories, a sample from each group was selected at random. The selected 36 stakeholders were approached via phone and/or email and invited to participate in the survey; out of the 36 invited, 18 agreed to partake in the study.

The resulting sample was characterized by actors who more than likely would be active in some capacity in any future food system coalition work, as indicated by their involvement in the nascent food system group and their receptivity to participate in the study (given that the Maricopa Food System Coalition was not yet constituted at the time of the study). These stakeholders represented members of civil society and public service groups (food banks, extension agents, and public health officials) (5 of the 18), independent activists (4/18), policy officials (3/18), producers (3/18), waste management representatives (2/18), and a retailer (1/18). While their perspectives cannot be said to be representative of Phoenix residents in general, they are indicative of individuals who are already actively engaged in influencing food system development in the area.

Semistructured interviews were conducted in person or by telephone and generally lasted 30 to 45 minutes. Interviews were recorded, transcribed manually, and then the responses were coded for each question according to recurring themes emerging from the data (Bernard, 1994). Each participant was interviewed individually and was not given additional information beyond the provided questionnaire. This insured that the answers of each stakeholder would accurately reflect their unique perspective. Following our framework, the interviews focused on questions pertaining to the interviewee's position and responsibilities in relation to the food system, their conceptualization of the system boundaries, their specific vision of sustainability, their primary concerns in achieving a sustainable food system, and what interventions they felt should be prioritized.

Results

Stakeholders' Roles in the Food System

We hypothesized that the stakeholders' different perspectives on the food system would depend in part on their specific position within the system and their associated beliefs and responsibilities. In an effort to determine the degree of influence one's positions has on people's beliefs and actions, we asked interviewees to describe what food activities they were engaged in and their responsibilities in those activities. The interviewees volunteered activities that represented both supply chain activities associated with their positions in the food system (e.g., food production, processing, and distribution), as well as specific domains on which the stakeholders perceived themselves to have responsibilities and influence (e.g., education and community building).

Not surprisingly, each stakeholder's primary occupation (Table 1a) and associated mandates (Table 1b) had a strong influence on their activities within the food system. For instance, those individuals in civic service and policy officials (8/18) were the only ones to raise the importance of policy development. However, besides the expected occupation-activity correlations, we discerned two additional patterns. All of the interviewed stakeholders were involved in "cross-pollination" by participating in at least two of the 11 food system activity categories; that is, they often reflected interests and perceived responsibilities beyond the scope of their primary occupation. A few actors were even involved in four or more food system activities as part of their professional and private lives. Second, certain activity categories can be considered cross-cutting interest domains, such as education (10/18), community building and food associations (9/18), and program and project development (9/18). Given the number of respondents who identified with these types of activities, it is clearly essential that food system analysis incorporate domains of action and responsibility beyond the traditional activities associated with the food supply chain.

Defining a Food System

A common tension in any sustainability governance initiative is defining the nature of the system

that is to be governed (Ostrom, 2011). Any effort to improve a local food system will depend on the compatibility of different actors' ideas of what the system is, what it includes, and what it does not. The majority of the interviewees responded the question, "What is a food system?" by invoking the ideas of a closed loop system, incorporating the primary activities of the food supply chain (an interconnected structure encompassing everything from production to waste disposal). Some respondents (civil organizations, waste management) saw the system as being locally embedded: "a closed loop, having a circular structure, with local farms." However, most respondents described it more abstractly: "Everything is a web. We have to provide collective food for everybody." These responses reflect two ways of considering the meaning of a food system; the first way constitutes a

Table 1a. Stakeholders by Self-Identified Career

	Career affiliation					
	Civic Service	Activist	Policy Official	Producer	Waste Mgmt.	Retail
1	X					
2	X					
3	X					
4	X					
5	X					
6		X				
7		X				
8		X				
9		X				
10			X			
11			X			
12			X			
13				X		
14				X		
15				X		
16					X	
17					X	
18						X
Total	5	4	3	3	2	1

Table 1b. Stakeholders by Perceived Areas of Interest, Influence, and Involvement

	Domains of Interest, Influence, and Involvement									
	Education	Community Bldg.	Program Develop.	Production	Distribution	Policy Develop.	Retail	Food Bank Charity	Waste Mgmt.	Monitoring/ Enforcement
1	X	X	X		X	X		X		
2		X	X			X				
3	X	X				X				
4	X		X			X				
5			X		X			X		
6	X			X						
7	X	X					X			
8	X	X	X							
9		X	X							
10				X		X				
11		X	X			X				
12	X		X						X	
13			X	X	X		X			
14		X		X			X			
15		X		X	X					X
16	X			X	X		X	X	X	
17	X							X		
18	X				X		X			
Total	10	9	9	6	6	6	5	3	2	1

focus on the nature of existing food activities in particular places and the relationship among specific activities (e.g., production, waste, distribution); the second invokes the normative meaning of a “systems” framing for food in terms of what it should look like or what it should accomplish (e.g., connections, health and nutrition, collective food, cyclical structure). While some stakeholders perceived a food system to be associated with the resource context of food activities, others emphasized the social and institutional elements of a food system. In this vein, some stakeholders described a food system as, for example, the “people and processes” of those “who have a say in how [food] is grown and distributed” and the social connections and the “nexus of programs and policies” that taken together ensure food access—e.g., the “connection of consumers, producers, distributors, and a nexus of programs, policies that come together to make sure people have access to food.”

Perceived Boundaries of a Food System

It is not only the content of a food system that is in dispute in any attempt to intervene and manage system change, but also how system boundaries are perceived. The responses revealed that system boundaries can be perceived to be geographic in nature (e.g., “Phoenix metro area,” “National,” or defined by climate conditions). System boundaries can also be defined by social, biophysical, or economic networks and institutional processes (e.g., “imports and exports” or “resource cycles”). Respondents accompanied perspectives with critique, reflecting their normative beliefs and ideas about what the boundaries of a food system *should be* while recognizing that current systemic conditions were not ideal.

Prominent in the stakeholders’ responses was a concern over the large geographic expanse of the Phoenix food system, as well as the commercial and industrial nature of the food supply and its distribution in Phoenix. They commented on the “big grocery stores and big box stores,” the large distances that food is traveling, and the predominance of “massive distribution and massive transportation.” A participant stated that “most food comes from thousands of miles away, about 1,500 miles” and highlighted the need for a “local

nutrient cycle.”

This perspective was not just related to food moving into the region for consumption. One stakeholder commented on how much of the food produced in Arizona is exported:

I think of local food. I describe boundaries as not set, permeable and changing...[The] unique thing about Phoenix system is the amount of food that is grown here but is exported elsewhere. Arizona is an Ag state, but most of it leaves the state. — *Civil Organization*

While recognizing the long distances and economic networks that are embedded within Phoenix’s food system, most interviewees indicated that this sprawling structure was undesirable and that a more geographically bounded system would be preferred. Current boundaries (a mixture of local, national, and globally connected systems) were “inadequate” and “flawed,” threatening food security with an imbalance of locally produced versus imported food:

It’s as generic as can be because stuff has to come from elsewhere. Unbalanced. — *Retail*

Inadequate. Flawed. If food stopped coming to the city, we would have three days of meals...If only 30% of Phoenix residents were growing their own food it would be better. — *Activist*

Nevertheless, some respondents noted that in some areas (e.g., desert areas) it “no longer makes sense” for food to be grown. Others, particularly those stakeholders involved in retail and distribution, considered the boundaries of the Phoenix system to be fairly “generic” and noted, “stuff has to come from somewhere.” In contrast to a focus on geography, material, and economic flows, some stakeholders from civil organizations emphasized the interaction of social needs, barriers, and physical boundaries in defining the food system—including economic disparities, health problems, land and tenure access inequalities, as well as economic and policy

restrictions for producers in terms of possible pathways to consumers.

In every food system there are a number of things that have broken down, from low pay to farmers to no access for the ones that need it. . . . Every food system is different, with their own problems. . . . Some of the issues that come to mind [here] are water—the need and availability, property rights ownership, issues that make use of land for agriculture in Phoenix more difficult due to politics and residential developments. Not a lot of support or sympathy for folks that aren’t able to afford a healthier diet and for making “poor choices”—looking down on people that have barriers. The anti-undocumented sentiment dampens families with young children from accessing healthy, nutritious food. —*Civil Organization*

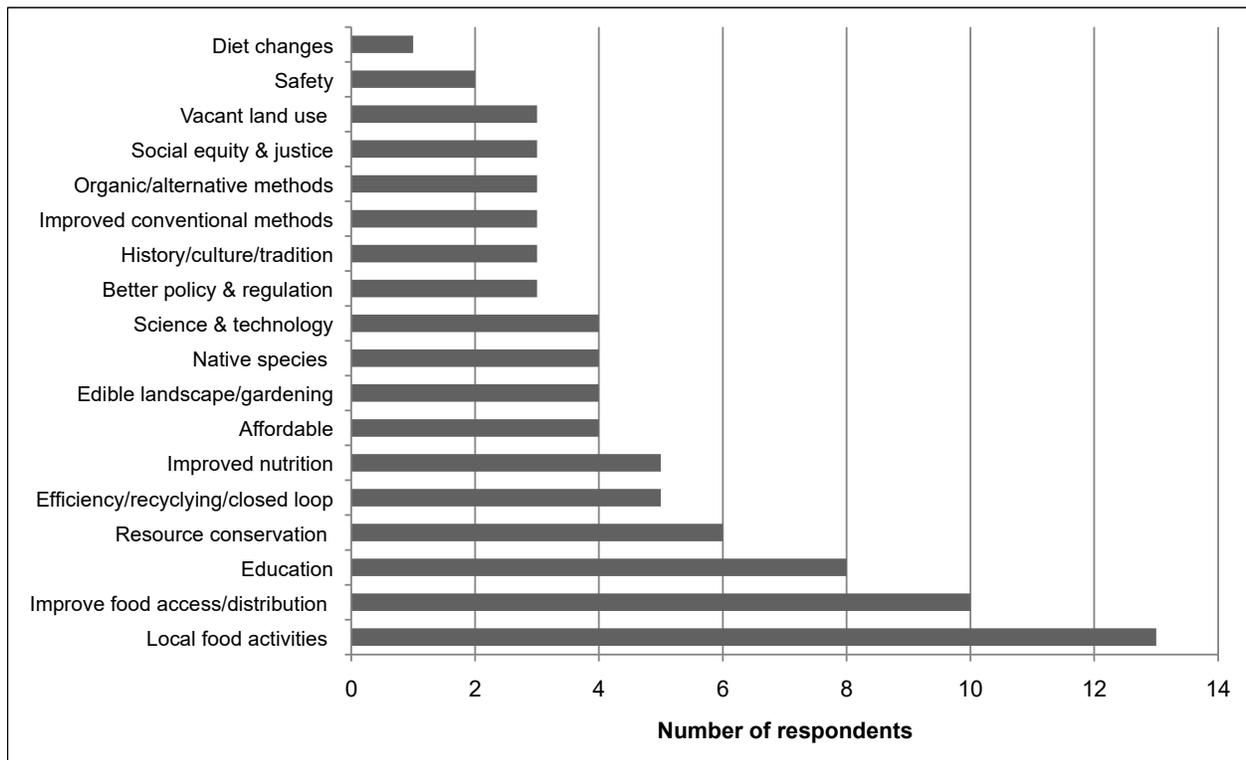
Regardless of the perceived extent of system boundaries, most of the interviewees perceived that their influence on the system was largely confined

within a radius of 150–250 miles (240–400 kilometers) around the city. Other policymakers, like producers, also expressed concerns over food system self-sufficiency. They drew attention to a perceived lack of shared perspectives by different stakeholders about food systems and their boundaries, arguing that this produces “no cohesion [and] no preferred outcomes.”

Envisioning a Sustainable Food System

Some agreement on what the desired state of a system should be is fundamental to any collective effort for sustainability analysis. The responses to the question “What is a sustainable food system to you?” were varied, invoking outcomes such as “improved nutrition,” “improved access/distribution” or “social equity and justice.” Responses also invoked mechanisms perceived to be instrumental to such outcomes such as “education,” “local food activities,” “organic/alternative farming methods” and “resource conservation” (Figure 2). The most prominent themes were the relationship of local food activities to social equity and justice, and the need for food activities and

Figure 2. Desirable Characteristics of a Sustainable Food System According to Stakeholders



diets to better reflect the environmental constraints and opportunities of the urban region:

There are currently 900 thousand people in AZ who do not get enough to eat, 15% elders. . . . [We need] community food systems—where people are able to access healthy, nutritious, culturally appropriate food that has been produced in a just way ALL time. —*Civil Organization*

How do we get distribution to those most vulnerable and which need it the most? For example where are the farmers' markets? Not in low-income communities, they are at places where people have access to healthy quality food. Rebranding the term from farmers markets to something more accessible—to make it more appropriate and affordable—to encourage the use of food stamps. —*Civil Organization*

Others incorporated self-production and urban landscape changes as part of what constitutes a sustainable food system:

Edible landscapes that have appropriate plants for our environment. —*Activist*

We need to change our diet to a diet that is based on food that grows in desert environments. —*Policy/Regulation Official*

More people growing their own food or buying from local farmers, or just more included in decision processes. Transparency. —*Civil Organization*

The number of interviewees who echoed the above sentiments, and the passion in which these opinions were expressed, speaks to a general discourse in which the local food movement is positioned as the savior of food in the United States and elsewhere. Stakeholder suggestions on how to realize the vision of local food were varied. Suggestions included introducing zoning policies that enable urban farming, reclaiming vacant lots, educating citizens about cultivating their own food in

their backyards, creating a seed bank, facilitating the preservation and sharing of seeds, and allocating resources that support local small producers and create local jobs. Most of the respondents echoed the need for a sustainable food system to address multiple functions and needs. As one participant put it:

A system that is not so heavily focused on just economic outcomes, that allows for better environmental and social outcomes (more subsidies so that farmers can improve livelihood, and offset the economic costs of growing things in a more environmentally responsible way). . . . Allowing for adaptive diets that [are] regionally appropriate. —*Civil Organization*

One stakeholder delineated a list of factors necessary to have a truly local sustainable food system:

Sustainability is a stop gap measure, what we mean by sustainability is to further sustain what we are doing. . . . How do we design regenerative systems? There are seven parts: 1) education, 2) create farmers, 3) local seeds, 4) culture (policy, etc.), 5) value added products, 6) collection & distribution, and 7) alternative farming methods. When all these are working, we will have a thriving system. —*Activist*

Nevertheless, the majority of the stakeholders viewed the possibility of creating a sustainable food system in the Phoenix valley as a huge undertaking. This was implied by the language used to address the question: “very radical,” “challenging,” and “doubtful.”

Challenges to Achieving a Sustainable Food System

Stakeholders were asked what they viewed as the major challenges for achieving a sustainable food system. In aggregate, they identified 13 areas of concern: education, problems with successful collaboration and follow-through, corporate power, policy and regulations, food deserts, waste, misconceptions about the taste and price of healthy food,

social (in)justice, monocropping, local food exports, environmental degradation, lack of infrastructure, and industrialization (Figure 3).

According to stakeholders, the greatest barrier to achieving a sustainable food system is the lack of childhood education programs, particularly those that emphasize direct connectivity to sources of production and the experience of production (rather than, for example, nutrition per se). They expressed that these programs could teach children about our food production in order to help them connect to the food chain and empower children to make a difference:

[Kids] don't even know what plant they are looking at. . . . If we got our young people properly educated on how to grow edible landscapes to take responsibility and empower themselves. —*Activist*

Every school should have a school garden. . . . For people to be in touch with their food we

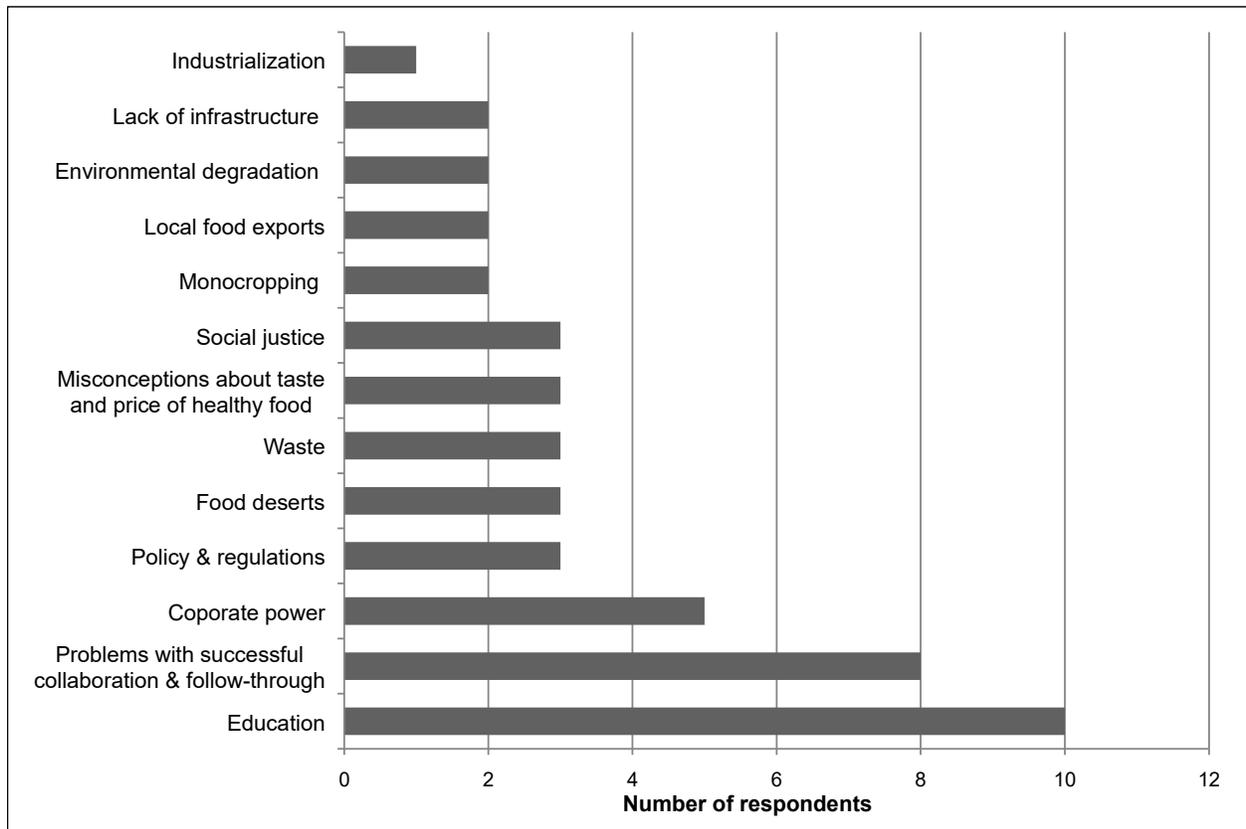
need to start with the kids. I would hate to give up on adults, but there is a lost generation of people who think food needs to be fast food. —*Producer*

Stakeholders also mentioned the importance of educating local people, citizens, tourists, and stakeholders as a means of reinforcing sustainability efforts.

Everybody [is] set up to survive off the mega supermarkets. It is designed around the idea of “how do I provide more for less money.” . . . It should be “this is my health, this is what I’m living off. . . . We can educate people and give them the ability to find that resource. —*Activist*

A system that educates not only local people but also tourists, to show them that we can grow the food here in this dry state but that we also can distribute in an eco-friendly way

Figure 3. Challenges to Achieving a Sustainable Food System in the Phoenix Valley



and then finally recycle it. —*Waste Management*

Successful collaboration and follow-through were understood as the involvement and collaborative work of various stakeholders with a common goal, where the work is continued over time. Stakeholders perceived this to be difficult to achieve in Phoenix:

People don't know how to work together. . . .
If it's not their idea, to hell with that!
—*Activist*

Meetings that I go to—the people are far removed from the people they are trying to serve. Largely they have a class privilege talking about poor people's food access. . . . [Meetings] are not conducive to people participating. —*Civil Organization*

[What is needed is] having a good core group that understand each other and sees eye to eye with the goals. —*Activist*

Several of the participants mentioned corporate control as a problem with the current food system and a barrier to sustainability, and linked this issue with the need for improved consumer education.

Factory farming is all about big money and profit and the only way we're going to change that is with our feet and our votes; consumers need to vote with their purchasing power. Maybe the most important thing we need to do is try to educate I guess. . . . It would be nice to get better information presented in a fair and impartial way so people could get an idea of the value of taking control of their own health by eating better and being more mindful of the food choices they make.
—*Producer*

Of the eight stakeholders directly involved, to varying degrees, in public service and policy, only three pointed out the importance of local, state, and national policy and regulations in achieving food system sustainability. They expressed that

polymakers should focus on making changes in the bigger system as well as over the long term.

The day-to-day work everyone at different agencies are doing is great but they don't provide long-term policies! [What is needed is . . .] a food council that takes a problem and resolves it, then moves to the next issue. One that creates effective policy and programs.
—*Civil Organization*

We need policy changes, that comes through elections. —*Civil Organization*

Values to preserve from the existing food system
In an effort to assess what stakeholders valued in the existing system, we asked participants if any aspects of the current food system should be preserved. Interviewees emphasized the growing food movement in Phoenix as enabling positive developments recognizing greater support of farmers markets, community supported agriculture (CSA), and community gardens. They also emphasized the incorporation of orphan crops and technologies that preserve and enhance ecosystem services, efforts at increased cultural preservation, individual empowerment, and innovative programs that support urban agriculture and food education.

Many respondents suggested that the demand for change in the system is already evident in the increasing activity they have noticed at farmers markets, CSA programs, and community gardens, as well as the overwhelming support for these programs from consumers and government officials:

There are exciting programs coming up such as Phoenix Renews, which utilizes public abandoned/unused lots to make something useful for the communities, gardens, parks. . . . County extension agents teaching nutrition education classes . . . Local agricultural production programs that provide support to producers. —*Civil Organization*

Despite the generally enthusiastic support of existing avenues of direct marketing and local production, participants also indicated contradictory

feelings toward the overall functionality of farmers markets. They also urged restructuring them to make sure the markets are healthy, accessible for everyone, and inclusive of all cultures represented in Phoenix:

Farmers markets have lots of junk—jams and jellies and butters and really “shit” food. It’s not healthy. It’s all dependent on the agricultural legacies of colonialism. —*Producer*

Others emphasized diversity as one of the greatest strengths the Phoenix Valley has to offer, representing an untapped resource that needs to be incorporated in the local food movement:

We should learn from and embrace the past [Native American traditions] as well as celebrate it. —*Policy/Regulation Official*

There’s underground things going on, but they are [all] separated. . . . Cultures should feed off each other, make each other stronger, celebrate each other. —*Activist*

Transitioning to a sustainable food system

Respondents overwhelmingly emphasized a need to start the development of a sustainable food system with an investment in the social dimensions of the system through empowerment, improved communication, collaboration, and common understandings of challenges and solutions.

There’s so much you can do on a local level by reaching and bringing people together with common interest and cooperating, whether it be through leveraging your buying power. —*Producer*

Understanding what is there! Something that can be a blessing and a curse if the number of folks that are trying to change the system. They are easy to identify, but if we could only get them on the same place and get them to work together. —*Civil Organization*

There are so many people that have built up perceived ways on how the system should

function, but they should take a step back and see what is REALLY going to make the biggest impacts and where we’ll benefit. . . . How do we get everyone together and figure out what we really want? —*Activist*

In creating a sustainable food system, others stressed the need to organize individuals into a food policy council to “get things done.” However, several expressed caution as to how big any one organization should be in order to actually achieve their goals and move forward. For example, one interviewee stated, “trying to get people together to form a local food coalition is the hard part. People cannot work together, working at a grassroots level, teaching farmers, getting farmers to grow their own food and share it; community is feudal, when it comes to getting things done, egos get in the way!”

Respondents advocated for educating the public, especially youth, for a deeper understanding of food production, policy, injustices, and resources and opportunities that are available. This deeper understanding would include improving our “relationship with food” by strengthening our knowledge of where food comes from and how its cultivation can affect our bodies via nutrition.

I would create a growing smarter program with teens to make cities implement urban boundaries that would encourage less lawns and more gardens. Education is key to everything. —*Policy/Regulation Official*

Educate the public about the food policy council, get the people’s perspectives on what issues need to be addressed. Apply a just governance system—who sits at the table? Who is represented? We need to get everyone on the same page, not only speaking but understanding the same language. —*Civil Organization*

We can combat food insecurity, educate the public on “what health looks like.” —*Civil Organization*

Respondents also emphasized improving

resource efficiency through technological innovations and resource management strategies. Strategies to improve resource efficiency included micro-drip farming systems, improved land use (i.e., more gardens and fewer lawns), and reducing food waste.

Identify available arable land for farmers, set up a system to reduce water costs. —*Civil Organization*

We should start with recycling food waste! We need to take food waste to food desert, school, community gardens and break it down there and educate locals about the value of food. —*Waste Management*

Lastly, several interviewees suggested the need to empower people and create a more “just governance system.” Empowerment was thought to be possible through increased self-sufficiency in production as well as through more inclusive governance. Their ideas reflect the need to create “social spaces” where food acts as a mechanism for social action (i.e., Feenstra, 2002).

Community organizing for collective power for long term instead of short term service approach. —*Civil Organization*

Bring everyone into the conversation and get them involved, create ownership for everyone and make them feel what they are contributing make a difference, which it does. —*Policy/Regulation Official*

Influential actors in the Phoenix food system

The willingness of any actor to get engaged in the process of system change is not only a function of how he or she views his or her own responsibilities and self-efficacy, but also how he or she views the influence and responsibilities of others (Grothmann & Patt, 2005). When asked what actors had the greatest influence on the local food system, most respondents perceived national political and corporate actors to have the greatest influence and power.

I firmly believe that politicians no longer have

the power to do anything because the corporations really have the power. —*Activist*

I think the dominant players in the Phoenix food system are not people in my circle, they are people in big leather chairs behind a big desk, behind a big corporate office. —*Producer*

The big business. They drive a lot of what people are eating, are controlling what [people] have access to. —*Activist*

City and state actors and local consumers were perceived to be relatively less influential in the system, although some expressed hope that consumers could be empowered to create change.

Consumers and definitely policy makers (they are the one that need to be approached, people working at the city and state). You can buy products at farmers markets but there needs to be policies and programs that make it possible for change to occur at a larger scale. —*Civil Organization*

Money is the power. You vote with your dollars. Consumers have the power potential to lead change but are at times unwilling to change. —*Activist*

[Consumers] have the numbers. When enough people get behind the movement, Phoenix citizens have to grow at home instead of buying groceries. After year one, they realize they can plant a seed that costs almost nothing and get a whole plant and do not have to buy groceries. This will empower the people. —*Activist*

Discussion

The Advocacy Policy Coalition framework is premised on the idea that individuals who become involved in systemic transformation via politics (i.e., policy councils or coalitions) are moved by their desire to convey their beliefs, values, and ideals into policy (Sabatier, 1988). Researchers working with the Institutional Analysis and Development framework also highlight the

importance of the different value sets and priorities of stakeholders, as influenced by their positions and associated activities, and how these influence any “action situation” (Ostrom, 2011). Food policy coalitions and groups are, in their essence, initiatives to create spaces for collective action; thus, it is important to assess the starting positions and perspectives that disparate actors bring into these arenas to give shape to the processes of change that follow. To date, most academic attention on food policy councils and coalitions has been in the frame of evaluating their value and structure in urban planning (Pothukuchi, 2004; Pothukuchi & Kaufman, 1999), the challenges they face, and their abilities and limitations in enacting change (see, for example, Allen, 2010; Barthel, Parker, & Ernstson, 2013; Bedore, 2014; Colding & Barthel, 2013; DeLind, 2011; Harper et al., 2009; Holloway et al., 2010; Schriff, 2008; Slocum, 2006). Pothukuchi and Kauffman (1999), for example, were early advocates for incorporating food system assessments and agendas into traditional community planning. Stakeholder perspectives and their congruence or dispersion around food system objectives are less addressed in this literature, although they are often recognized as important. For example, in a study of collaboration around Baltimore’s food system governance, Bedore (2014) found that collaboration was partially attributable to the ability of such groups to identify both a use value and an exchange value in food system initiatives, as well as their ability to draw on “civic capital”—i.e., shared identity and trust tied to place. As Raja et al. (2014) describe, the planning community has advanced in embracing many concepts and approaches to food system innovation over the last decades. Nevertheless, there is a risk that the engagement of planning and policy in local food issues will not be sufficiently reflexive, critical, and transparent to address grassroots interests and agendas (Raja et al., 2014). For example, Raja et al. (2014) analyzed food system change in Buffalo, New York. Their analysis found that two of the seven factors they associated with productive, progressive change reflected the advantage of a shared history of food system practice. They also reflected a common vision among the “radicals” who were participating in the city’s efforts for food system change. Nevertheless, we

often know less about how diverse individuals in the city come together to create the common visions that eventually prove instrumental for food system change (Bedore, 2014).

There is also relatively little focus on the degree to which the perspectives and beliefs held by individuals were divergent prior to any formal activity of coalition building and system change (Marin, Ely, & van Zwanenberg, 2016). Knowledge of the range of perspectives *prior to* forming a coalition not only can serve as a baseline for understanding any subsequent convergence in perspectives, but also can serve to evaluate what viewpoints over time become less dominant or may have been marginalized in policy processes. Assessing the diversity of visions and viewpoints of individuals *prior to* any collective process may also allow such individuals to freely verbalize their motivations, goals, and vision for their food system. Moreover, it allows them to do so independently of their social position or ability to influence others. As Hoey and Sponseller (2018) noted, tensions between those sitting at the table are the main barriers to successful and long-term change—tensions that have already been noted by the interviewees in this study.

It was evident from the interviews that the values, ideals, and beliefs, as well as positions, social networks, and associated activities of the interviewees, help shape their modes of action, behaviors, and idealized views on what a sustainable food system should be. This diversity of viewpoints, however, is not necessarily a detriment to any emergent coalition. If a coalition can form with principles of inclusion and equity, it can generate significant value and have potentially greater leverage in effecting food system change (Block et al., 2008; Carolan, 2006). Our study provides some initial insights into these issues and potentially identifies some critical areas where thinking about mechanisms for cross-scalar change may need to be enhanced.

The Current Food System

While many stakeholders perceived a need for structural transformation in order to achieve sustainability, their conceptualization of the food system conflated realist and idealist perspectives.

Interviewees recognized the strong influence of supply chain structure, national and transnational commercial actors, and national policy on current processes and outcomes; however, their response was to envision a system with a strong place-based center, characterized by grassroots initiatives and capacities for change. This is not surprising as the actors participating in this study were those with geographically local mandates, roles, and responsibilities. Their perspectives epitomize the complexity of food system change; that is, there are numerous elements of the multiscale, interconnected food system that are perceived to be exogenous and out of the control of local actors, and these elements are often perceived to be the most important and instrumental in driving food system outcomes. Nevertheless, actions to transform systems that do not explore how to effectively engage with these actors and larger-scale processes may ultimately be only partially effective (Allen, 2010).

Food System Dynamics and Boundaries

Insights from Institutional Analysis emphasize the importance of defining system boundaries. These insights also emphasize cross-scale institutional influences on system dynamics in any initiative to govern a shared resource (Ostrom, 2007). The interviewees had wide-ranging ideas about what constitutes a food system, what might be considered to be the boundaries of the food system, and the organizational levels at which food system responsibilities reside. For example, the concept of “community” arose as an integral part of a sustainable food system, yet the scale and scope of “community” were not clear. While the food system was often defined in terms of “local” social and environmental interactions, these interactions were typically idealized and abstract. Underneath the emphasis on community was also an implicit assumption that greater “closeness” and proximity would enhance equity within the system, although this assumption has been challenged in the literature (see Allen, 2010; Born & Purcell, 2006; DeLind, 2011). Many respondents reflected some of the aspects of Winter’s (2003) concept of “defensive localism,”— i.e., a reactive ideology in which local *must* be better in the face of the perceived negative externalities and politics associated

with the globalized food economy. Scholars have pointed out the importance of connecting activism and policy, arguing that community members, activists, and government entities can work toward institutionalizing sustainable food systems efforts through local policies (Allen, 2010; Campbell, 2004; Feenstra, 2002; Pothukuchi, 2004; Pothukuchi & Kaufman, 1999). As many scholars have argued, local may be the solution to some of the challenges in the food system. However, it is often the case that local is a (poor) proxy for more complex and implicit concepts of empowerment, identity, and social embeddedness (Winter, 2003).

Essentials to Achieving a Sustainable Food System

A majority of the interviewees insisted that education—particularly that of consumers—is absolutely critical to the development of a more sustainable food system, demonstrating the belief that it is through individual actions (i.e., “voting with your dollar”) that widespread change materializes (e.g., Garnett’s [2014] “Demand restraint”). Some stakeholders believed that in order to enact long-term change there is a need to start early, for example by establishing garden programs in schools to teach kids how to grow their own food and appreciate healthy products. Others spoke on the need to educate residents about growing their own food in their backyards and about making “healthier” food choices, emphasizing experiential and affective education over information dissemination. The emphasis on experiential education implies that respondents felt that solutions to the challenges preventing food system sustainability already exist. It also suggests that respondents felt that new technologies or knowledge are not as critical as educating people about existing information and solutions and motivating them to action. This focus on education echoes the priority action around which many existing policy coalitions have concentrated their efforts (Schriff, 2008; Sherb, Palmer, Frattaroli, & Pollack, 2012). This underscores the finding that education is an area where local food actors perceive they have agency and influence. However, this focus on individual actions and the approach of voting with your dollars tends to favor more affluent individuals with access to the resources needed (e.g., money,

time, and transportation) to change their modes of action and consumption, motivated by pressure from their social networks, the acquisition of new knowledge, and their subscription to social trends (Ericksen, et al., 2010; Guthman, 2003; Guthman, 2008).

Local food production and direct marketing were strong components of the participants' visions of a sustainable food system in the Phoenix area, reflecting a more structural-transformation perspective on sustainability (Garnett, 2014). Stakeholders concurred that there was a need for a greater focus on programs and projects promoting local production and marketing (e.g., farmer markets, gardens, nutrition classes, etc.) as the initial steps in transforming the system. Many of the respondents saw corporate power as a hindrance to a more sustainable system. They saw the connection between corporate influence and governmental regulation as part of a larger power structure imbalance that could be remedied with increased local ownership and control. Given that many of the respondents were involved in local production, policies, and activism, this result is not surprising. Their perspective also reflects an important general trend that increasingly embraces localization as the tonic for the ills of the global food system (DeLind, 2011).

Possibly reflecting the early stage of the policy process (given that the policy coalition was not yet formed when we conducted this assessment), very few of the interviewees focused on policy and regulations—in other words, the formal institutions of the food system—as points of intervention for achieving a sustainable food system. Presumably, once the stakeholders were formally participating in a defined “action situation” in which they had acknowledged roles in governing the local food system, specific policies and formal public programs would become subjects for intervention (Raja, et al., 2014; Scherb et al., 2012).

The lack of attention given by the interviewees to local and state policy and regulations may also reflect the general perception conveyed by the interviewees that the food system is currently dominated by actors and entities that are geographically distant from the Phoenix area and by (unregulated) market transactions. Despite the

recognition of a need for a more structural transformation, interviewees tended to focus on non-governmental action and grassroots change. Still, one stakeholder expressed that “the day-to-day work everyone at the different agencies are doing is great but they don't provide long-term policies.” This stakeholder discussed that the small-scale activities are beneficial, but the important changes have to be made in the system: “You can buy products at farmers markets but there needs to be policies and programs that make it possible for change to occur at a larger scale.”

As stakeholders in the Phoenix area organize to influence food system evolution, making explicit the underlying meanings and objectives of their use of *local* will likely enhance the prospects of success. It appears that *local* is being used to refer to more than just food sustainability. It seems to reflect locally embedded interactions focusing on intimate relationships of knowledge and trust. In the IAD framework, these are called the “attributes of community,” which form fundamental inputs into any effort to improve governance. As the community moves forward with its plans for food policy, it will be important to open a discussion of what is intended by *local* and what attributes stakeholders associate with localization. It may be that the desired outcomes of the food system can be achieved by other mechanisms that do not necessarily imply geographic localization (see the discussion in Allen, 2010; Born & Purcell, 2006; DeLind, 2011).

In summary, the values, interests, and positions of the interviewed stakeholders suggest that food system assessments at the local level, designed to support food policy coalitions and councils, may benefit from mapping out how stakeholders envision the system that is at the center of food policy work and how specific interventions will result in broader system change. To date, there has been little effort to undertake such formal assessments in preparation for coalition building and food network development; however, the importance of such assessments are featured in a variety of approaches to system transitions and transformations in sustainability research and practice (see, for example, Olsson, Galaz, & Boonstra, 2014; Smith & Stirling, 2010). Theory on cross-scalar

processes of system change highlights the importance of creating experimental spaces, fostering adaptive and reflexive learning, and enabling leadership and transparency (Smith & Stirling, 2010; Westley et al., 2013).

While food policy coalitions and councils potentially could play such transformative roles, they have tended to be more conservative spaces, focused on programmatic areas of consensus rather than more structural or radical change (Harper et al., 2009; Schiff, 2008). Enhancing the possibilities of coalition influence in change processes may mean expanding coalition membership. Sabatier (1988) posited that advocacy coalitions often need to push to expand system boundaries by engaging stakeholders from outside the key interest groups that form their core constituents in order to acquire additional resources to mobilize change. As the food policy coalition begins its formal work, participants will gain access to new information and create new knowledge; this process will undoubtedly empower some “latent” actors to become more active and involved, potentially altering the nature of coalition strategies (Sabatier, 1988).

Conclusion

This study aimed to fill a gap in the literature by documenting and identifying the diversity of stakeholder perceptions in the predevelopment stages of forming a “sustainable food system.” The nascent efforts to build a food policy coalition in the region are an important first step in bringing together individuals who share a belief system and thus are likely to effectively mobilize for change. As in most publics, and in relation to most sustainability issues, stakeholders move fluidly from critical and subjective assessments of existing problems to idealized notions of what solutions should and could be enacted.

While many of the interviewees aimed for food system transformation—highlighting the inequitable and inefficient national and global structural forces in the food system—their solutions were ultimately focused on “demand restraint” through education and efficiency improvements in the function of the system (Garnett, 2014). Their comments and reflections underscore the ultimate

challenge of food system change: on the one hand, there is a recognition and desire for fundamental food system reorganization; on the other, the mechanisms that local stakeholders have available to them are limited in influence by broader-scale institutional structures that govern food system dynamics. It is possible that the efforts of food policy coalitions may be strongest as nodes in larger, regional networks (Sonnino & Beynon, 2015). By focusing on education, sustainable production, and connectivity in the local food system, such coalitions can build demand for change. As nodes in a national network of local, municipal, and county initiatives, these “action arenas” may provide the foundation for more fundamental structural changes at higher scales—challenging as well as defining the limits of agency and food system boundaries in the process. Over the last decade, a number of national organizations have formed to coordinate communication across local-level initiatives (e.g., Food Policy Action, the National Sustainable Agriculture Coalition, and the Food Policy Network of John Hopkins University); these national-level groups may become increasingly instrumental in enabling local groups to effect structural change.

It is important to note that, in addition to inadequate education as the biggest barrier to achieving a sustainable food system, a majority of participants also mentioned a lack of communication and/or collaboration. This result suggests that participants were aware of the fragility of transformative spaces and the importance of building trust in order to build and maintain a movement that is capable of long-lasting change. Food system work can be deeply ideological and emotional for many activists; engaging in formal methods and activities that make diverse perspectives visible for exploration may prove to be increasingly useful for coalition formation. Participatory research and emerging approaches in sustainability science have much to offer in this regard. In addition to the interviews and analysis conducted in this manuscript, with the help of researchers, participants in the initial stages of policy coalition formation can engage in standard approaches such as fuzzy cognitive mapping (e.g., Gray, Zanre, & Gray, 2014) or Q-methodology

(e.g., Steelman & Maguire, 1999) to explore the diversity of perspectives within their emerging networks.

Unsurprisingly, the main areas proposed by the interviewees for initial intervention echoed what they were already doing—building on their individual histories of food system practice, as has been documented in other cases (e.g., Raja et al., 2014). Many argued that these initiatives would need to be inclusive and culturally appropriate, ensuring that all Phoenix residents had equitable access; however, few interviewees had clear ideas on how to achieve this. As in many large metropolitan areas, the growing demographic diversity intersects with divergent needs and values in the food system. Enacting food system change that addresses the underlying social and economic inequities in the food system is challenging. The origins of these structural concerns are often perceived to be beyond local influence; moreover, the *solutions* that are advocated by food change agents are embedded in socio-cultural assumptions about what is “good” or “right” for oneself and, by extension, others. Once again, ensuring that diverse sectors in the city can share what sustainability means for them, and why, is essential before sustainability objectives are set.

In summary, this study provides initial insights into the diversity of perspectives and objectives that food policy councils should consider in order to achieve just and sustainable outcomes. The

assessment of perspectives and beliefs of food system activists presented in this paper can be used as a baseline assessment from which emergent coalitions of actors can evaluate several factors. These factors include how their membership network has evolved over time in terms of sector representation, perspectives on the causes and appropriate mechanisms for system change, and, importantly, what constitutes the domain of action for intervention. In the case of the now-constituted Maricopa County Coalition, an analysis of participant perspectives could be significant in indicating a convergence in beliefs and strategies. A convergence in beliefs could either be the result of enhanced communication and understanding or, perhaps, a result of the absence—perhaps exclusion—of some of the sectors and associated viewpoints represented in the interviews initially conducted.

This initial exercise in reflective thought can thus lay the groundwork for a dynamic process of learning, innovation, and experimentation for food system solutions at the community level. While most food system assessments that have been completed or are underway in the United States prioritize stakeholder involvement and participation, the framework used here could provide needed structure to initial baseline assessments. This framework can also highlight points of convergence and divergence in perspectives before the challenging work of planning begins. 

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Pairing a Q study with participatory decision-making around orchard workplace safety: A case in Washington's tree fruit industry

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Abstract

Tenets of participatory decision-making speak to the importance of meaningful participation from diverse stakeholders for improving both process and outcomes. But what participation actually looks like can vary substantially, and constructing a group where all actors can truly speak is often

elusive. In addressing controversies over pesticide safety in tree fruit orchards in Washington State, we used a Q study to identify divergent viewpoints and convened a group to bring these views together. The resulting stakeholder working group was then challenged to both acknowledge their often-opposing viewpoints and to construct a mutually beneficial idea for improving pesticide safety in the tree fruit industry. This paper explores the dynamics of this stakeholder working group, analyzing not only its successes but also its

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challenges and difficulties. Rooted in a mainstream agricultural industry in the western United States, this study highlights the ways in which seemingly simple things like who “shows up” and why can shape processes and outcomes.

Keywords

Q Study, Participatory Action Research, Pesticide Safety, Stakeholder, Farmworker, Migrant, Engagement, Tree Fruit

Introduction

Participatory decision-making asks for meaningful engagement from diverse stakeholders in addressing mutually relevant problems or needs. But the implementation of such processes can vary substantially, and achieving truly *meaningful* participation across viewpoints is typically easier said than done. In this project, we used a Q study, which is designed to systematically identify relationships between participants’ views on a subject (Watts and Stenner 2012), to lay out divergences in viewpoints regarding pesticide safety in Washington State tree fruit orchards. We worked from there to create a process of engagement across divergent views. Our goal was to bring together stakeholders across the tree fruit industry to talk about concerns regarding orchard workplace culture and safety and opportunities for improving it; in other words, our goal was to allow for a more pluralistic form of decision-making in this agricultural industry, whereby stakeholders with different views and different levels of power could interact to solve problems of mutual concern.

The Case: Tree Fruit in Central Washington State

The Washington State tree fruit industry is a US\$7.5 billion industry employing about 187,000 permanent and seasonal workers (Globalwise & Belrose Inc., 2014; U.S. Department of Agriculture, National Agriculture Statistics Service [USDA NASS], 2012; U.S. Department of Labor, 2013; Washington State Farmworker Housing Trust, 2008). Nationally, Washington State has the third largest number of migrant and seasonal farmworkers and the second highest rate of nonfatal farming injuries, with most agricultural injury claims

coming from orchard sectors (Keifer, Salazar, & Connon, 2009; Pelnecke, Forland, & Wines, 2015; U.S. Department of Labor, 2013). As such, questions of health and safety are of paramount importance in the tree fruit industry. One potential health and safety concern is pesticide use.

Orchard crops such as apples typically receive more pesticides per unit area than other crops because the market for high-value fresh products tolerates few blemishes. The use of particularly toxic pesticides has dropped significantly in recent years (USDA NASS, 1998, 2008) due to changes in regulation and the availability of “softer” pest control products; however, many farmworkers, pesticide applicators, and environmental groups remain concerned about pesticide use and the potential neurological, oncological, and developmental risks of pesticide exposure (Alavanja et al., 2004; Arcury, Quandt, & Russell, 2002; Halfacre-Hitchcock, McCarthy, Burkett, & Carvajal, 2006; Liebman & Augustave, 2010). This is especially important in that workers may not have the resources to advocate for their own workplace safety. Many workers in tree fruit orchards are immigrants of Hispanic origin who face cultural and linguistic barriers. Some lack legal status to work in the U.S. or are financially vulnerable, making them hesitant to complain for fear of being fired or deported (Kandel & Donato, 2009). Many seasonal farmworkers (particularly those who migrate to pick fruit) cite pesticide exposure as one of their top concerns, do not feel adequately trained to work around pesticides, or say that training is done in a format they do not understand (Hofmann, Crowe, Postma, Ybarra, & Keifer, 2009; Hohn, 2010; Mayer, Flocks, & Monaghan, 2010; Rohlman, 2010). And yet, this view of pesticide risk is not shared by all. For example, many farmers feel that they provide pesticide safety training to workers and that, if pesticides are used appropriately, they are fairly safe. Other farmers contend that most migrant fruit pickers are not directly exposed to pesticides at work and that in some cases, more extensive training could worry farmworkers more than protect them (Kandel & Donato, 2009; Quandt, Arcury, Austin, & Saavedra, 1998; Thompson, Coronado, Puschel, & Allen, 2001). These differing viewpoints present challenges to

reducing occupational risk in agriculture, as actors do not agree on the nature of the risk or even on whether a measurable risk exists. This means that improvements remain inconsistent from farm to farm, depending on how individual farms and workers implement safety measures (CDC, 1999).

These differences in viewpoint have practical implications because the tree fruit industry, like many agricultural industries, operates with a strong chain of command; that is, the views of those with more power over workplace practices (typically but not always, orchard owners or head managers) are often different from those with less power (in this case farm employees, including migrant workers) (Holmes, 2013). And yet, this industry is more complex than a meeting of the “powerful” and “powerless.” Most daily orchard operations are run by middle managers, often former migrant farmworkers who have, over time, come to be employed as field supervisors and managers. And most of the orchard acres in the state are managed by operations who employ hundreds of people in roles ranging from (migrant) fruit pickers to pesticide applicators, tractor drivers, tree pruners, supervisors for picking and pruning crews, safety managers, horticultural managers, pest management consultants, mechanics, human resources personnel, head managers, and orchard owners. Cultural differences are also embedded within these hierarchies. For example, Latinos occupy most middle manager roles (e.g., crew supervisor, safety manager, horticultural manager), year-round worker roles (tractor driver, pesticide applicator), and seasonal worker roles (migrant fruit picker, pruner), but they occupy less than 10% of orchard owner roles (NASS, 2015). These divides are changing somewhat as more Latinos become owners and primary managers; nevertheless, they imply a situation where, as individuals at each level of the hierarchy report to those above them and supervise those below them in the chain of command, axes of power, culture, and viewpoint on risk come together and often conflict (Holmes, 2013). In other words, different viewpoints on pesticide safety are embedded in a complex structure of power, needs, and motivations; therefore, the different parties are typically not on equal footing when wrestling with these clashing

viewpoints (Lehrer & Sneegas, 2018).

In particular, research has found that perceptions of risk tend to be lower among white men than among women or people of color for reasons likely related to vulnerability and control (Flynn, Slovic, & Mertz, 1994). Because ethnicity, race, and gender tend to correlate with position in agriculture, when risk mitigation measures are based on the dominant or “expert” (often white male) view, those measures are not necessarily satisfactory in the eyes of other stakeholders (Flynn et al., 1994; Holmes, 2013). In the case of pesticide safety controversies, this can set up a seemingly unresolvable conflict where some stakeholders argue that risk is well managed while others maintain that employees are left vulnerable.

This study asked whether bringing diverse viewpoints on pesticide safety into conversation within a stakeholder process could mitigate some of the challenges that come from these differential power dynamics. We first used Q methodology (i.e., a “Q study”) to identify the differences in views on pesticide safety across the tree fruit industry and to make them more transparent. Second, we brought together individuals with differing viewpoints into a working group. We wanted them to discuss their differences and, if they wished, seek areas of agreement for improving safety in orchards. By allowing views held by stakeholders with less power to be heard alongside views held by stakeholders with more power, we hoped to allow the group to identify improvements that could be made only with input from multiple sectors. Note, however, the importance of the word *views* above; that is, we did not bring together stakeholders from all *jobs* in the tree fruit industry; rather, we used Q methodology to be able to represent the *views* of these diverse stakeholders across their different roles (see further discussion of this distinction in the analysis). Our goals were (1) to create a broader and more equitable representation of groups and viewpoints in defining and addressing issues of pesticide safety and (2) to engage with some of the power imbalances and exclusions in decision-making processes, especially in a highly structured industry like tree fruit in Washington. In doing so, we are responding, in part, to calls from scholars such as Becker (2011) and Slovic (1997)

who argue for democratic processes in dealing with questions of risk reduction to help improve both decisions themselves and promote trust in those decisions.

Literature Review: Power and Participation

Addressing stakeholder participation in decision-making taps into an established literature from multiple disciplines including policy, collaborative governance, organizational psychology, and strategic management (Brugha & Varvasovsky, 2000). While these fields provide useful insights into stakeholder choices and dynamics, they are not always centered heavily on power, a crucial mediator of collaborative decision-making in an industry such as tree fruit. To address power more centrally, we draw from the field of development studies, which has developed a strong and yet contentious relationship with participatory and inclusive decision-making processes. While this literature centers much more explicitly on “elevating the powerless” than did our work, we pull from it because it delves deeply into the almost banal details that often construct power relations (Gaventa & Cornwall, 2006). Even as other frameworks see power as an important consideration and create mechanisms to work with (or around) questions of power (Huxham, 1996), they spend less time with the logistics of what makes power a constructive force (such as time and place of meetings, “real” versus tokenistic inclusion, etc.). Thus, despite some dissimilarities between our study and those typically examined in development studies, we draw on the international development literature for its particularly granular and practical assessment of power as a shaping force.

Participatory processes in the world of international development find their origins in a critique of “top-down” development projects. They seek greater inclusion of stakeholders in decision-making such that they would not only be included in, but would also share control in the research process, assessments, and the translation of research into practice (Chambers, 1997; Impey & Overton, 2013; Lilja & Bellon, 2008; Sen, 1999). Fiorino (1990) notes that this kind of participation belies an ethical commitment to involving people in issues that concern them and also functions as a

more effective way to make better decisions (see also Carr, 2002; Chambers, Kenton, & Ashley, 2004; Escobar, 1995; Morissey, Clavin, & Reilly, 2013; Smith, 2008). Reid (2000), as described by Caretta and Riaño (2016), notes that while one cannot really create a level playing field across demographic and social inequalities, collaborative processes can lead to both greater shared power and new scientific insights.

There have been many successes reported in such participatory development projects (Dreyer, 2000); however, there have also been critiques of development practitioners adopting the language of participation without its commitment to empowerment and self-representation—an attempt to implement top-down projects that are framed as “bottom up” (Evans et al., 2004; Few, Brown, & Tompkins, 2007; Parfitt, 2004; Sinwell, 2008). Though Pimbert and Pretty (1996) note that participation can legitimately range from being informed of decisions or being allowed to comment to taking part in joint analysis and decision making, Cooke and Kothari (2001) argue that participation can easily become a form of tyranny where external facilitators maintain control, powerful members of a community dominate, and efforts focus on using specific tools recommended for participatory processes rather than ensuring that those tools actually facilitate a participatory and inclusive process. As such, some argue that participatory processes themselves can be quite dangerous, as they can neutralize political opposition through a superficial nod to inclusion (Ellis, 2011; Janes, 2016; Kapoor, 2005). And yet, proponents and critics of participatory processes alike continue to seek out broad participation in research, decision-making, and project design. In seeking to develop a participatory process that is meaningful, scholars have noted several attributes of importance:

1. **Inclusion:** This includes knowledge of the factors that might limit participation, including the time and location of meetings, financial constraints, literacy and language, gender and ethnicity, and internal power dynamics that might make some more or less likely to speak while others are there

(Williams, 2004). It also includes recognizing that the assumption that people necessarily want to participate is flawed; rather, in deliberative democracy, people will get involved in decisions if they are interested in them. The choice to participate (or not) can vary across time, topic, or group and is rarely static or easily defined (Few et al., 2007; Hauptmann, 2001; Warren, 1996).

2. **Tools and measures:** Knowing that stakeholder processes can reproduce power inequalities even in the name of inclusion, Mitchell (1997) suggests structures and exercises for creating a space of trust, transparency, and openness. This involves making sure each person is encouraged to talk if they wish, using cooperative decision-making tools, small group work, and visual or ranking exercises (see also Brown, Tompkins, & Adger, 2002; Brown, Few, Tompkins, Tsimplis, & Sortti, 2005; Few et al., 2007; Renn, 2006; Stirling & Meyer, 2001). In other words, scholars note that an attention to *how* participation is operationalized matters.
3. **Understanding power:** This attribute involves accepting power as a constructive force. Even when seeking to create a space outside of normal hierarchies, the dynamics of who participates and who does not, and how that participation unfolds, remain. And presuming to take decision-making outside of the normal power dynamics of society fails to recognize that the implementation of such decisions must take place within society. But while this makes power a crucial force to consider, it does not necessarily make stakeholder work impossible; rather, acknowledging divergent viewpoints and community heterogeneity can be a bridge to working together in such spaces (Berman & Phillips, 2000; Cooke & Kothari, 2001; Dudley, 1993; Few, 2001; Godfrey & Obika, 2004; Mattessich, Monsey, & Corrinna, 1997; Muria, 2000).
4. **Alternatives to consensus:** This attribute involves acknowledging the limits of consensus and foregrounding the idea that

perhaps consensus is not the goal. Deliberating together does not always produce consensus; rather at times, it can heighten conflicts when the interests and values of participants clash (Few et al., 2007; Owens, Rayner, & Bina, 2004; Pugh & Potter, 2003). Mouffe (2005) suggests that, instead of seeking to avoid antagonism, groups can work to transform it into agonism—where stakeholders recognize the legitimacy of differing views even while acknowledging that there may not be a solution. In contrast, an excessive focus on consensus can eliminate needed space for disagreement (Korf, 2010; Mouffe, 2005; Tsouvalis & Waterton, 2012).

5. **Time:** The process of engaging appropriate people, avoiding control by dominant groups, building trust to recruit participants, and having people speak for themselves rather than for others all takes time (Brown et al., 2002; Cooke, 2001; Grimble, Aglionby, & Quan, 1994; Mohan, 2001; Townsend, 2013). Funding and project timelines can create incentives to reduce a participatory process to simple consultation; instead, to really include stakeholders in a process, they need to help construct the process (Fox, 2013; Jamal, 2004). Furthermore, having stakeholders who are committed to being involved over a long, often extended period of time can be crucial to the survival of a participatory process (Small, 2004).

These attributes—which focus on inclusion, tools to build trust and transparency, an active understanding of power and alternatives to consensus, and the investment of time—are useful not only in development, but also in this case—a study of a different set of stakeholders in the U.S. They are also useful in light of fact that, in the literature on agriculture and sustainability, power is at times not thoroughly addressed and at other times treated more as an assumed hierarchy of inequity and injustice rather than a complex and ever-shifting matrix (Alkon & Agyeman, 2011; Gottlieb & Joshi, 2010).

In this study, we pull from the literature on participatory processes in exploring the dynamics of a stakeholder group process on pesticide safety and workplace culture in Washington State. One difference here compared to the literature is that we do not define stakeholders primarily by their role (e.g., migrant fruit picker or head manager) but rather by their view of certain issues (as categorized by our Q study). At times, however, we map those views onto an analysis of the people who hold them. In this paper, we will share our successes and especially our concerns and questions about this process. We also explore how this case study might reflect, and also offer insights for scholars and practitioners of, participatory decision-making processes.

Methods

Knowing the limits and challenges to implementing participatory processes, our goal was to provide, to the extent we could, *more* equal voice to the members of our stakeholder group. The group was convened based on a Q study conducted in 2012-2013 which classified divergent views surrounding barriers to pesticide safety in Washington State orchards. Q methodology is a tool developed by William Stephenson that uses inverted factor analysis to find correlations between participants' views on a subject. Designed to draw out differences and similarities among stakeholder views, it can reveal commonalities in beliefs among participants. These differences and similarities can be illuminating, especially when working through high conflict issues. Key to the use of Q methodology is the contention that views do not always correlate with roles (Brown, 1980; Watts & Stenner, 2012). For example, in our case, one tractor driver may hold similar views on workplace safety to another tractor driver, or s/he may hold views closer to those of someone who performs a different role, such as a migrant fruit picker or middle manager. Thus, Q is used first to identify and systematize viewpoints across a broad diversity of participant roles and positions. It is also used to explore how these viewpoints map back onto various stakeholder roles. Data are collected in the form of a Q sort, where participants sort a collection of statements compiled ahead of time by researchers to

encompass the many views surrounding a subject. For our study, these statements were based on published and unpublished research on perceptions of pesticide safety. They were also based on 18 interviews and focus groups from 2012 that were conducted in Spanish and English with a total of 34 individuals, including pesticide applicators, orchard managers, growers (farmers), pest management consultants, health care workers, researchers and extension personnel, educators and trainers, migrant fruit pickers, lawyers, pesticide safety activists, and government conservation specialists (Lehrer & Sneegas, 2018).

Q study participants were selected using purposive and snowball sampling methods to represent stakeholders from all types and levels of positions in the tree fruit industry. This included those along the full chain of command within the industry as well as those working in positions that support, regulate, or critique the tree fruit industry. Participants were recruited at migrant worker housing camps, classes for tree fruit supervisors and middle managers, occupational health and safety conferences, tree fruit industry conferences, and through contacts from the first author's prior work in agricultural research and extension in central Washington State. Ultimately, half of the Q study participants worked inside the tree fruit industry (industry representatives, pest management consultants, growers, managers and supervisors, pesticide applicators, and migrant fruit pickers). The other half worked in roles of support, regulation, or critique (researchers, educators and trainers, public health professionals, conservation professionals, legal advocates on migrant worker rights, and migrant farmworker health advocates).

Participants received 45 laminated cards, each containing one Q statement (see Appendix A for a list of these Q statements). They could use a card deck printed either in Spanish or in English and could either read the cards themselves or have the researcher read them aloud, so as to minimize any obstacles of language or literacy. Participants were instructed to place each card onto a sorting grid, with the left-most column labeled "least like my view," the right-most column "most like my view," and "neutral" as the central column. Each participant sorted the statements according to their

opinions and also completed a post-sort questionnaire about the process. In this way, the results yielded a snapshot of their views on the topic being studied. The sorts were then analyzed using factor analysis to determine groupings of shared perspectives (Watts & Stenner, 2012). The goal was to systematically identify stakeholder perspectives or viewpoints and make them transparent to participants so that they could be used by our multi-stakeholder group to negotiate pesticide safety and risk mitigation measures. A total of 41 Q sorts, completed by individuals with a stake or interest in the tree fruit industry—from migrant farmworkers and year-round orchard employees to orchard owners, industry consultants, farmworker advocates, researchers, and educators—were analyzed using the PQMethod 2.33 statistical software (Schmolk, 2013). Our participant demographics are found in Table 1, arranged by grouping or perspective (see the section on Q study results for a further explanation of these groupings). See Lehrer & Sneegas (2018) for more detail on this Q study and how it was conducted, including more information on the Q statements, the sorting process and analysis, and the participants.

All individuals who participated in the Q study were invited to join the subsequent working group process to delve into these different perspectives and use them to identify and perhaps pursue a mutually acceptable path to resolving pesticide safety concerns. Of the 41 Q study participants, 24 expressed an interest in participating, and each

received a formal invitation to do so. Table 2 shows the breakdown of the participants who wished to participate in the working group and those who did not (as well as which of these actually attended any working group meetings). This information is arranged according to their position inside or outside of the tree fruit industry (for a further analysis of the contours of participation and non-participation, see stakeholder group results).

Of the 24 participants who were, given their expressed interest, formally invited to participate in the working group, three replied that they were no longer interested (but did not give a reason); eight said they were still interested but could not make the first meeting; five said they “might” attend (but did not); and eight attended the first meeting. Of those eight attendees, two were educators, two worked for government or extension, one was a farmworker health advocate, one worked for a tree fruit industry association, one was a pest management consultant, and one was a year-round pesticide applicator and crew leader. In total, five half-day meetings were held. Four of them were held during 2014—February (eight attendees), March (four attendees), May (six attendees), August (five attendees)—and one was held in July 2016 (five attendees). Each meeting was run by a professional facilitator, and the first two were simultaneously interpreted in Spanish and English by a professional interpreter (at the last three meetings, all participants were comfortable in English).

Table 1. Demographics of Q Study Participants

<i>Attribute</i>	Skeptics	Acceptors	Incrementalists
Gender	Both women and men	All men	All men
Culture/language	Both Spanish- and English-speakers	All English-speakers, one bilingual in Spanish	All Spanish-speakers, one bilingual in English
Mean age	43 years	52 years	40 years
Jobs	Orchard managers, orchard employees (year-round and seasonal/migrant), educators, farmworker advocates, public health	Consultants, growers, researchers, industry representatives	Growers, orchard managers, orchard employees (year round and seasonal/migrant), educators
Direct experience with pesticides	Little	A lot	A lot
Percent with any years of college or above	58%	60%	33%

Table 2. Interest and Participation in Working Group among Q Study Participants (Sorters)

Participation in working group from within tree fruit industry		Participation in working group from outside tree fruit industry	
Sorters who said they wanted to participate (# who did attend)	Sorters who said they did not wish to participate	Sorters who said they wanted to participate (# who did attend)	Sorters who said they did not wish to participate
5 pest management consultants (1 attended)	2 pest management consultants	3 farmworker or health advocates (1 attended)	2 farmworker advocates
3 growers or managers (0 attended)	2 growers or managers	3 government or extension (2 attended)	5 government (public health) workers
3 year-round orchard workers (1 attended)	2 year-round orchard workers	1 researcher (0 attended)	1 researcher
2 industry representatives (1 attended)	3 migrant farmworkers	4 educators (2 attended)	
Total: 13 (3 attended)	Total: 9	Total: 11 (5 attended)	Total: 8

Participants filled out evaluation forms after each meeting to help improve subsequent meetings. All procedures were approved by the Institutional Review Boards at Washington State University and the University of Washington.

Results

Although not the primary focus of this paper, an overview of the Q study results is presented here first so as to illuminate how they informed the stakeholder group process.

Q Study

The Q study that served as the base for our stakeholder working group found three different viewpoints (or factors) regarding pesticide safety in Washington State tree fruit orchards. The first view, referred to as the “Skeptic,” was held by individuals who are concerned about the environmental and human health impacts of pesticides and who do not see current regulations as sufficient protection from pesticide exposure. The second worldview, the “Acceptor,” agreed that there is risk in pesticide use, but believed this risk to be small, well understood, and under control. The third worldview, the “Incrementalist,” focused primarily on opportunities to make human capital and technology improvements in the workplace. Like the

Skeptic, the Incrementalist worries about human health but agrees with the Acceptor that solutions lay in improved communication rather than regulatory or structural changes. For a basic outline of these three worldviews, see Table 3. For more detailed results, see Lehrer & Sneegas (2018).

As suggested by the literature on risk (Flynn et al., 1994), the three factors identified in the Q study match a pattern of risk assessment that lines up with gender, cultural differences, and, slightly less so, age, education, and employment (see Table 1). All the women participating in the study (15 of 41) were classified by their Q sorts as Sceptics, while Acceptors and Incrementalists were all men (although it is worth noting that this split also correlated with employment). Nine of 10 Acceptors were English-only speakers (one was bilingual), whereas Incrementalists were all native Spanish speakers, and 15 out of 22 Sceptics were bilingual or Spanish-only speakers. Acceptors were slightly older than the other groups, Sceptics and Acceptors were both highly educated, and Incrementalists had less formal education (33% had some college, as compared to 58% and 60% of the other groups). While there were growers and/or head managers in all three factor categories, the majority of Acceptors tended to work in higher level tree fruit industry positions or industry-

Table 3. Summary of Q Study Views

<i>Q Study Worldview</i>	Skeptics	Acceptors	Incrementalists
What concerns you?	Environment Human health	Cannot produce fruit without pesticides	Human health
Why does it concern you?	Human knowledge of risks insufficient	Pesticides well understood Part of reality	Inherent risk of pesticide use
What is working well?	Not clear from Q study*	Benefits are important and risks are mitigated	Existing system protects workers as well as it can
What more can help?	Regulation Enforcement Training	Communication Training	Training Communication Technological innovation Industry funding Labels in Spanish
What are the obstacles?	Lack of will to address safety	Language barriers People are afraid because they don't understand agriculture	Funding
What would <i>not</i> help?	Industry self-regulation	More regulation	More regulation
Who don't you trust?	Industry Government	Emotion	Not clear from Q study*
Who do you trust?	Not clear from Q study*	Science Industry	Government Industry
What complicates this?	Uneven implementation of safety	Uneven implementation of safety	Knowledge of work force and abilities
How safe is pesticide use in orchards?	Not very safe	Quite safe (esp. vs past) Inherent risks well managed	As safe as can be, given system

* "Not clear from Q study" indicates a field where researchers were not able to pull a clear and consistent response from the Q sorts of participants who loaded on that factor; for example, while Skeptics' and Acceptors' Q sorts and comments were explicit in terms of who or what they did not trust to adequately protect workers' health, there was less clarity and consistency from Incrementalists in that regard. While the data (and subsequent working group discussions) certainly provide some indication of the positions around these issues, we did not wish to speak for anyone when their views were not explicitly clear.

support positions. Some orchard managers, farmworkers (both migrant/seasonal and year-round employees), and educators were categorized as Skeptics, and others loaded as Incrementalists; but, none as Acceptors. The remaining Skeptics were government representatives, public health employees, lawyers, and other migrant farmworker advocates. These differences suggest that, as supported by the literature, demographic differences account for part (but not all) of the differences and similarities among the three groups' perspectives on pesticide safety.

Worth noting as well is the finding that Acceptors were more likely to have direct experience working with pesticides—slightly more than Incrementalists and significantly more than Skeptics (Lehrer & Sneegas, 2018). This self-reported lack

of interaction with pesticides among Skeptics can be attributed to the fact that many Skeptics work either outside the tree fruit industry or in positions with little direct interaction with pesticides (in the tree fruit industry, pesticides are sprayed by year-round orchard employees. The use of pesticides is banned during the weeks prior to picking, which is when migrant farmworkers, for example, typically enter the fields; this is not to suggest that migrant farmworkers do not run the risk of pesticide exposure while living and working in and around orchards, but rather that they rarely interact with pesticides or pesticide application as a part of their jobs. Therefore, migrant farmworkers participating in this study typically asserted that they had little direct interaction with pesticides). Many of the managers, educators, and researchers that loaded as

Acceptors and Incrementalists—i.e., those who one might not presume to have significant experience with pesticide applications—had spent years prior to their current positions working as pesticide applicators and year-round employees in orchards or had current responsibilities related to pesticide safety training.

Stakeholder Group

Those attending the stakeholder working group meetings comprised a subset of the larger group of Q study participants. They differed from one another by their factor, the strength of factor loading (how strongly they aligned with their factor, with higher numbers (closer to one) indicating closer alignment), their role in the tree fruit industry, and their demographics (see Table 4; the four participating Skeptics are coded as S1, S2, S3, and S4; the Acceptors are coded as A1 and A2; and the Incrementalists are coded as I1 and I2). Notably, the makeup of the stakeholder working group changed over the course of the project. Of the eight attendees at the February 2014 meeting, only four returned in March. Two were unable to attend because of scheduling conflicts (A2 and I2), and two dropped out of the group because the group was leaning towards an area of less interest for them (S3 and S4). A2 returned for the May 2014

meeting, but I2 was not able to attend because his work kept him busy during the growing season. A1 dropped out after May 2014 for similar seasonal work-related reasons. In addition, the group invited several additional stakeholders from regulatory agencies and farmer organizations to the May and August 2014 meetings who had expertise in the area the group chose to pursue. The final meeting, held almost two years after the fourth meeting to accommodate the group's interest in a related research question (see below for more details), was similar in composition to the group that attended the second and third meetings (S1, S2, I1); the meeting was also attended by representatives of a newly formed tree fruit industry association that replaced A2 upon his retirement. The additional stakeholders who attended the August 2014 meeting did not return for the July 2016 meeting; because they were not original members of the working group and did not attend more than one meeting, they are not included in the table below. Note that all participants and potential participants continued to be invited to each meeting.

During the first stakeholder meeting, in February 2014, researchers presented preliminary results of the Q study for discussion. Participants aired thoughts and concerns, commented on how the results resonated with their experiences, and

Table 4. Stakeholder Working Group Participants

Participant	Job/role	Gender	Language spoken	Factor	Loading score	Meetings attended
S1	Safety educator	Female	Bilingual (native Spanish)	Skeptic	0.72	Feb, Mar, May, 2016
S2	Extension	Female	Bilingual (native English)	Skeptic	0.65	Feb, Mar, Aug, 2016
S3	Government	Female	English	Skeptic	0.79	Feb
S4	Health educator	Female	Bilingual (native Spanish)	Skeptic	0.83	Feb
A1	Pest management consultant	Male	Bilingual (native English)	Acceptor	0.66	Feb, Mar, May
A2	Industry representative	Male	English	Acceptor	0.77	Feb, May, Aug, replaced for 2016
I1	Safety educator	Male	Bilingual (native Spanish)	Incrementalist	0.48	Feb, Mar, May, 2016
I2	Pesticide applicator	Male	Spanish	Incrementalist	0.62	Feb

suggested the names Skeptic, Acceptor, and Incrementalist for the three factors. The majority of the three-hour session was spent exploring the differences among these three clusters of viewpoints. Near the end of the meeting, participants brainstormed a list of projects for improving pesticide safety in orchards that they thought might be mutually acceptable to members of all three of these clusters, despite their acknowledged differences in viewpoint.

During the second meeting, participants selected one of those ideas—a training certificate program for supervisors who supervise crews of other workers such as migrant fruit pickers—and began discussing what might be needed to pursue it. The thought was that a large part of orchard safety, particularly for migrant and seasonal farmworkers, depends on supervisors—how they set the tone for work, what resources they provide, and how effectively they communicate (both with their own supervisors and with their employees). Participants noted that many supervisors are promoted to such roles because they are seen by their supervisors as “good workers,” but may lack the skills or training necessary to manage employees. Supporting their navigation of hiring and firing, communications, ethics, safety, leadership, and motivation was seen as a way to improve safety and engage workers.

During the third meeting, participants developed a proposal for a comprehensive series of courses that supervisors could complete as part of this training certificate (see Appendix B for training topic outline) and brainstormed potential institutional partners. They also asked the lead researcher to investigate other existing and potentially overlapping training opportunities in the tree fruit industry and to report back to the group at the next meeting.

During the fourth meeting, having explored existing training courses, the group decided that, rather than develop a new training program right away, they needed to learn more. As such, they asked researchers to go back and study what tree fruit companies and tree fruit supervisors already had in terms of supervisory training to decide whether a training certificate program would be needed, of interest, or of use in the industry.

During the fifth meeting, researchers presented the results from this study of tree fruit company representatives and supervisors, and the group decided to proceed with the certificate program. As of this writing, members of the group have been meeting and working with representatives of a continuing education program at a regional community college interested in housing the certificate with support from the tree fruit industry.

Analysis and Discussion

Contours of Participation

Looking at the trajectory of this working group process, we assess it against the literature’s recommendations to consider the role of inclusion, power, tools, consensus, and time in designing a participatory process.

Inclusion

When we formed the stakeholder group, its makeup was, intentionally, quite diverse—in gender, primary language spoken, and viewpoint (based on the Q study). At the first meeting, we had four men and four women; four native Spanish speakers and four native English speakers (of whom five were bilingual); and four Skeptics, two Acceptors, and two Incrementalists. However, the group was not as diverse in their jobs as the original range of Q participants had been. While the goal was again to represent all *views* from the Q study rather than all *jobs*, this makeup is worth analyzing, as it has implications for how participation affected working group outcomes. Finally, while similar numbers of participants working inside versus outside orchards were invited, attendees included a greater proportion of those who worked outside of the industry or in industry support roles (see Table 5).

There are several reasons for this. First, we invited everyone who expressed an interest in the process to participate in the stakeholder working group; however, “interest in participating” is complicated in and of itself. In particular, several things are important to note; first, none of the migrant farmworkers who participated in the Q study said they wished or were able to participate in the working group (see further analysis below); second, all the educators who participated in the Q study also

Table 5. Attendance at First Stakeholder Meeting, by Factor and by Job

<i>By Factor</i>	Indicated interest	Attended
Skeptics	12 (out of 22 in Q study)	4
Acceptors	7 (out of 10 in Q study)	2
Incrementalists	4 (out of 6 in Q study)	2
Confounded (i.e., loaded on more than one factor)	1 (out of 3 in Q study)	0
Total	24	8
<i>By Job</i>	Indicated interest	Attended
Those who worked in support roles	11	5
Farmworker or health advocates	3	1
Government/research/extension	4	2
Educators	4	2
Those who worked directly in tree fruit	13	3
Consultants	5	1
Growers/managers	3	0
Workers	3	1
Industry representatives	2	1
Total	24	8

wished to participate in the working group (and half did); and third, proportionately fewer of the Q study participants from within the tree fruit industry who said they wished to participate in the working group (growers, consultants, year-round orchard employees) actually attended meetings. In other words, the choice to participate not only reflects the level of participant interest, but is also a function of the particular structure and nature of this project and the groups involved (for example, had working group meetings been held only during the summer and located at migrant housing camps, participation of migrant workers could have been higher; had they been held only in winter and located at orchard workplaces, participation of growers and year-round employees could have been higher).

Given these trends and choices, educators, government workers, and extension professionals were disproportionately present at working group meetings, likely because they could attend meetings as a part of their job; a grower, pesticide applicator, or migrant fruit picker, on the other hand, would have to take time away from orchard work to come to meetings. This difference also manifested itself seasonally—that is, people in tree fruit support

positions were busier in winter (training season) and more available in summer, while orchard personnel were busier in summer (growing season) and more available in winter. This affected participation as the series of meetings progressed from winter into summer. Third, participants whose jobs had to do with education, research, or outreach were likely more drawn to this type of work—analyzing research and brainstorming solutions—than those involved in other aspects of the industry; this aspect of the makeup of the group likely also shaped the solutions that were proposed (see further discussion below).

Fourth, the tree fruit industry spans the entire north to south axis of central Washington. Meetings were held in Wenatchee, the center of the region, travel expenses were reimbursed, and stipends were provided; however, those living farther away, who might have to drive up to three hours each way to attend a meeting, faced more obstacles to attending. Similarly, and particularly relevant to the development literature cited earlier, migrant fruit pickers in particular took part in the Q study but not in the working group. When asked during their Q study participation if they were interested in participating in the working group, most migrant

workers said no; those who said yes noted that in the winter they would likely be back in Texas, California, or Mexico and would be unable to participate. In addition, while many returned each year to Wenatchee to pick fruit, they were paid by the amount of fruit picked, and the stipend offered for attending meetings did not compensate for losing a half-day's pay in a limited work season. While we would have preferred to have these workers form a key part of stakeholder meetings, we chose to accept their decision not to participate and sought other ways of keeping their views present (particularly through the analysis of Q study perspectives).

Of course, choice and structure are intertwined. Had we chosen to prioritize the inclusion of migrant farmworkers above other criteria, we could certainly have designed meetings to take place, for example, at migrant worker housing camps during off-hours at particular times of the harvest season. This could have boosted migrant participation, but also would likely have decreased the participation of industry representatives, government personnel, researchers, growers, and year-round employees with differing schedules. Holding meetings instead at orchard workplaces, as noted earlier, might have boosted representation from these latter stakeholders. However such a location could easily compromise the ability of migrant workers, year-round employees, and even middle managers to speak freely and comfortably.

Instead we chose to hold meetings at a relatively centrally located research center. To help foreground the needs of migrant workers, we relied on migrant farmworker support professionals, several former migrant workers (now employed in different roles) who were part of the group, and data from the Q study where migrant farmworkers had participated more fully. Most relevant to a Q method approach is actually the fact that all three *factors* or *worldviews* (in turn derived from a Q set and participant list that included migrant farmworker views, as well as those of other stakeholders who also did not attend working group meetings) were represented. In fact, we suggest that using Q methodology may be a way to achieve more diverse representation in a working group in cases where the participation of individuals may wax and wane. By focusing on the need to ensure

adequate representation of a handful of aggregated viewpoints rather than dozens of individual role-based stakeholders, Q methodology may be able to help ensure some measure of broader representation even in a small group. This could be the case even when details and process logistics exert strong influences on working group participation. That said, we very much understand that these choices were and are necessarily imperfect and are worthy of debate, as their implications for inclusion and exclusion are complex and fraught.

Tools

Given (and despite) these contours of inclusion and participation, one of our goals in the working group meetings was to address the inherent power dynamic that exists among different players in the tree fruit industry (*e.g.*, with consultants or industry representatives having more power in the typical chain of command than pesticide applicators, migrant farmworkers, or health educators). Even without all levels of the hierarchy present in the working group, this power structure certainly would have affected how free each participant might have felt to speak out at meetings. As such, we sought to minimize the reach of those larger power dynamics in the working group meetings (even while acknowledging that full success in this regard would be impossible). We did this through highly trained professional facilitation, team-building activities, structured exercises, and a combination of small group work with individual and full group work. For example, participants worked in groups of two to three individuals; together, they tried to brainstorm a comprehensive and wide-ranging list of efforts to improve pesticide safety. All ideas were then posted on a "sticky wall" where support (or concern) for each idea could be indicated confidentially with colored sticker dots. Once ideas were discussed and narrowed down, small groups were asked to discuss which ideas might face support or opposition from each of the Q factor viewpoints. They were also asked to think about what costs and benefits might accrue to which stakeholders from implementation of each idea and which stakeholders they might affect. In each of these processes, we made use of simultaneous interpretation, where all participants

(English and Spanish speakers alike) were asked to wear headsets so that conversation could proceed with greater fluency across the two languages. This followed best practices from Highlander Center trainings on “interpreting for social justice” attended by researchers and facilitators prior to their participation in this project.¹

According to the anonymous evaluations from the meetings, the tools used during working group meetings helped create a sense of teamwork and a willingness to engage with other group members (see direct quotes from evaluations in Lehrer & Sneegas, 2018). They also helped decrease, to some extent, the power differential not just among participants, but also between researchers and participants. The researchers and facilitators designed the structure and trajectory of meetings; yet, participants routinely interjected to change the flow of an individual meeting or even a series of meetings. For example, participants would repeatedly assign the researchers new information gathering tasks to help them make decisions. Again, this is not to suggest that these tools and measures created an even playing field for participants, but rather to note that they were designed with an understanding of power in mind.

Power

While the tools used to structure meetings were somewhat helpful in addressing the extant power structure, their limits also illustrated some of the difficulties outlined in the literature on participatory processes. For example, one participant, who had loaded very strongly on factor 1 (Skeptic) and worked mostly with migrant farmworkers from a position outside the tree fruit industry, said she felt uncomfortable at the first meeting because many of the solutions proposed focused on supervisors rather than on the more vulnerable migrant workers. Other participants, some of whom worked closely with migrant farmworkers, felt that, because other statewide and regional programs focused directly on migrant worker-driven organizing and advocacy rather than supervisory skills training, a focus on supervisors through this project could provide a missing link for improving working

conditions across the entire tree fruit industry. As the idea of a supervisor-oriented project gained momentum among a majority of the group, the participant at hand chose not to attend future meetings. The momentum of the group did not address her concerns adequately, and she presumably did not feel that she could, should, or wanted to persist as a minority voice.

Besides illustrating how participation is affected by group dynamics and choices, this may also be an indication that a stakeholder process that chooses to seek common ground is more likely to attract and retain stakeholders attracted to that premise as well. In contrast, those who load most strongly on their factor (Skeptics, Acceptors, or Incrementalists) may be less inclined to value or more concerned about what is lost by focusing on, an explicitly compromise-oriented process. While those who participated in the working group were not quantitatively more “moderate” in their factor loadings than those who did not, our strongest factor exemplar was the only one, as far as we know, who felt disempowered by or uninterested in the direction of the group and dropped out of the process in discontent (rather than for scheduling reasons). This then strengthened the role of those interested in educational rather than advocacy solutions (see more on consensus and inclusion below). It also speaks to Mouffe’s (2005) concern that a consensus-oriented process can lose some of the productive agonism that might be found in a process that sits longer in its areas of tension.

In another example of the contours of power and participation, one participant, a pesticide applicator, came to the meetings with another participant (in a higher level position) from the company where he worked. As an applicator, he was unable to participate during the busy summer season, and he was also less likely to come without his supervisor/colleague, in part because their orchard was two hours away. In addition, he was perhaps less likely to be outspoken with his supervisor/colleague present, thus providing presumably imperfect information and imperfect participation; yet, having the two come together was likely the only way we could garner his input in the first

¹ See <https://www.highlandercenter.org/interpreting-for-social-justice-highlander-workshop/>

place. We opted for his possibly guarded presence over the alternative of him not participating at all.

Consensus

When we brought the stakeholder working group together, initial discussions were energized, civil, and productive. Many (but not all) of the participants knew one another, as the tree fruit industry in Washington is a relatively small community. There was some debate, alluded to above, in terms of whether the focus for safety improvements should be on helping migrant fruit pickers protect themselves or on helping supervisors create a safer and more positive work environment for these (and other) workers. But as a consensus formed, wherein the majority of the group began to focus on the supervisor demographic, the participants less interested in working at that level dropped out. Thus, while the group remained diverse in terms of gender, ethnicity, and Q worldview or factor loading, it became more homogenous in terms of interest in supervisory trainings. In other words, there was a continual process by which the people who attended the meetings shaped not only the process and the outcomes, but also the subsequent makeup of the group. Those who felt that the project focus did not match their areas of interest left the group (Few et al., 2007; Hauptmann, 2001), further solidifying the decision to focus on supervisor training. This example of tension between viewpoints is perhaps the kind of tension that one thinks about as a classic obstacle to joint-decision making among diverse stakeholders—different groups prioritizing different needs and solutions with the ultimate resolution dependent on who holds the most influence in that context.

But what makes this particularly interesting is that the resolution of this tension depended in large part on the banal, often overlooked details of who “showed up.” Power and influence in the context of the working group was constructed via small decisions and situations that are not always registered as expressions of power. In particular, the group that decided to pursue supervisory skills training as a solution for workplace safety concerns was one originally shaped by many seemingly smaller factors. These factors include things like who had the time, interest, and energy for a

working group process (and for how long and under what circumstances); who was able to attend meetings at which time of year and in which locations; who ended up with other commitments (including last-minute trainings at work, doctor appointments, and forest-fire induced crises) that interfered with meeting attendance; how flexible participants’ regular jobs were (and at which times of year); how far they had to travel (including but not limited to their status as full-time residents of the region or migrants); what mechanisms were used to pay participants at work (salaried versus hourly versus piece-rate; in other words, whether or not our meetings “counted” as work for them); relationships among participants (both in terms of supervisory relationships and logistical ones such as a need to carpool to meetings); and basic interest in “problem-solving” projects of this nature. This is not to say that the working group process was haphazard or illegitimate; rather, it is to suggest that the ways in which participants differed in terms of the attributes above not only played into their choice of projects but also their joint decisions on things like when, where, and how to organize future working group meetings. This, in turn, affected who came to subsequent meetings. The Q study was designed to acknowledge stakeholder differences so that these differences would not be ignored in the search for a mutually acceptable project; however, the process of coming to a consensus around a particular course of action through a set of meetings that took place in real time and place, and amidst competing priorities for all members, did function, as in the literature, as an eventual obstacle to broader inclusion.

Eventually, these dynamics, combined with logistical issues such as scheduling constraints (two pesticide educators and one consultant were unable to attend the August 2014 meeting due to commitments that arose last-minute) and the group’s request to invite additional stakeholders interested in supervisory training, caused the makeup of the group to change for the fourth meeting (August 2014). The makeup of the fourth meeting was much more male and Anglo and included a higher proportion of representatives from grower organizations than at previous (or future) meetings. At this meeting, the group

retreated from immediate implementation of the training certificate idea to instead pursue further research on the need for such a certificate. On one hand, it is wise to fully assess the need for a new program before beginning to pursue it; indeed, participants from earlier meetings who had been absent at the fourth meeting but were contacted by phone for their input all supported this idea of further research. On the other hand, as one (Anglo, male, industry-insider) participant later suggested, a more Anglo, male, industry-insider group (like the one at the fourth meeting) might be comfortable with the status quo of the orchard; such a group might be less inclined to pursue quick changes and more inclined to focus on research that, for better or for worse, delays implementation. This dynamic illustrates nicely how the issue of who shows up (and why) can significantly affect a “participatory” process. It also suggests that, while supervisory skills training was perhaps not a direct enough solution for our justifiably discontented Skeptic, it was at the same time much too radical a solution for some industry insiders, who consequently may have sought to delay it (intentionally or not). This again suggests that given the conservative and highly structured nature of the tree fruit industry, developing even compromise-level projects related to social and workplace safety is something that must be approached cautiously. Accordingly, this charge to pursue additional research helped create a long delay between the fourth and fifth meetings.

And yet, at the fifth meeting, where the core stakeholders who had attended most of the meetings were once again present, and the newer (Anglo, male, industry-insider) stakeholders did not return, one participant interrupted the presentation of the research results on the industry’s perceived need for a supervisory certificate to say, “This is all interesting, but we all work in the field, we know from experience that a training certificate is needed.” The other participants agreed, and the group put the new research findings aside and moved back to brainstorming ideas for implementation.

Time

This stop-and-go trajectory is particularly interesting because the researchers designed this series of

meetings to be held with a consistent stakeholder group and to progress toward the goal of developing a practical project. And yet, due to inter-participant dynamics, the choice of project direction, and simple logistics, the makeup of the working group was not as consistent over time as we had hoped, even though the meetings built on one another. While this made the working group process arguably richer in its inclusion of more stakeholders, it also slowed the work down considerably. It took whittling the group down to a core, then re-whittling it back to that same core after new stakeholders had come and gone, for the group to make steady progress on its chosen task. This points, as the literature on participatory processes suggests, to two things in particular: the need for a long stretch of time to work through such processes with a set of stakeholders deeply committed to the process; and the tension between having a more diverse and deliberative group and a more “efficient” group where some diversity of opinions is lost. Notably, a project that moves more slowly might help reduce barriers to attendance for some marginalized participants; but it might also backfire if participants start to feel that they are not making enough progress for the time they are putting in.

Relatedly, this project moved along a grant-funded timeline. Supported by a five-year grant, the timeframe was adequate for this Q study plus working group process; however, it would not have allowed for significant deviations from the process had participants wanted to pursue additional aims. Researcher goals were fairly open (to develop “some sort of” project to improve orchard health and safety), and almost all working group decisions, from the project choice to the meeting schedule to the speed of implementation, were made by the group; however, it is clear that not all projects would have fit the time and resources at hand, and even the task of pursuing a project at all imposed constraints. As such, the work was guided and shaped by these opportunities and limits. Finally, supporting the continuation of the development of the supervisor certificate after the grant funding ended in 2016 presented new challenges. For example, the group applied for and received a small additional one year grant to help develop the

program curriculum; but, they ended up returning the seed money after six months due to the difficulty of making adequate progress in a one-year timeframe. Instead, the group is seeking a community college credential and sponsorships as well as more flexible grant-funding to be able to develop and pilot the project within a timeframe that better fits the group and the perceived needs of supervisors, farmworkers, and employers.

Project Outcomes

Ekboir (2003) suggests measuring the effectiveness of participatory projects by multiple metrics: research outputs (what came out of it), outcomes (how people used the outputs), impacts (how those outcomes affect end-users' lives), and mutual learning for participants and researchers. Here we adopt that framework to assess our stakeholder project.

In terms of outputs, the choice of an educational solution to a pesticide safety problem is worth analyzing. On one hand, focusing on the supervisor's ability to help maintain a culture of safety in orchards seems reasonable. Rather than focusing on migrant workers, for whom risk mitigation measures are crucial but frequently not under their control, or on upper management, who have less contact with workers, supervisors have access both to policies from the top and worker behavior and resources down the chain of command. On the other hand, training programs are often solutions that appeal to trainers, who were over-represented in our group from the very start (and in particular at the second meeting where the final decision to pursue a training certificate was made). Previous research in Washington State noted that educators tend to lean toward educational solutions to problems, even as other stakeholders prefer other solutions. For example, a series of surveys and interviews in 2007–2009 addressed the issue of inadequate hand-washing on farms and its implications for pesticide exposure. Pesticide handlers attributed a lack of hand-washing to missing soap or towels; some orchard managers attributed it to workers ignoring regulations; and health and safety professionals attributed it to inadequate training (even though handlers contended that they already knew how to

mitigate risk and therefore did not need more training) (UW-PNASH, 2010; WSU, 2010).

Even so, a solution focused on training is not surprising, given the project goals and the map of worldviews developed from the Q study. In the Q study, both Skeptics and Acceptors (the most diametrically opposed groups) mentioned training as an important solution. Incrementalists also saw a role for improvements to the orchard environment rather than, say, new regulations (which were supported by Skeptics but opposed by Acceptors and Incrementalists) (see “What more can help?” and “What would *not* help?” in Table 3). In this way, the choice to focus on training did not solely represent a solution of interest to those group members whose job flexibility, location, travel constraints, and other commitments allowed them to be present; it also represented a solution that is at least moderately palatable to each of the three viewpoints represented. In other words, a proposal for training most likely represents an area of consensus. As such, it is the kind of pragmatic solution that would result from this type of process. The way in which the group designed the training program was quite innovative (hands-on, skills-based, creative), but the very fact that a training program was chosen as a solution is not particularly out-of-the-box.

On the other hand, while the initial solutions proposed by the group in our brainstorming process included small adjustments in particular areas (improved pesticide label information in Spanish, or a more appropriate use of re-entry signs for orchards as highlighted explicitly by Q study consensus results), the training idea was a much more comprehensive, big picture approach to improving workplace culture in orchards. And in many ways, this kind of solution illustrates the point of using the Q methodology in a stakeholder process—to find common-ground solutions in a contentious field and to focus on what divergent groups have in common rather than trying to problem-solve at a more detailed level from polarized positions. While there is an important role for polar positions, conflict, and advocacy in change-making, the goal here was to seek out mutually acceptable (in this case, “safe” and unassailable) solutions and overcome the

roadblocks associated with having friction among viewpoints. But, importantly, this working group sought a consensus that was not based on erasing differences among diverging views, but rather on acknowledging those differences and choosing to work in areas where consensus could be productive rather than oppressive. While not all voices were clearly heard, as some participants dropped out, others entered, and still others never had the power or opportunity to come to the table at all, this process provides an interesting case for assessing the tradeoffs among the democratic attributes of participatory processes.

In considering outcomes, or how people used the research outputs, this stakeholder process did not particularly upend existing power dynamics in the tree fruit industry; that is, it ended up promoting supervisor training as a relatively palatable way to indirectly improve pesticide safety rather than tackling any issues of inequity or power head-on. But on the other hand, this kind of middle-of-the-road solution is likely the only kind of solution upon which the group assembled could have agreed. In other words, using Q methodology to circumvent solutions favored only by those who hold greater power in the tree fruit industry does not imply that solutions favored only by *other* groups will be adopted; rather, it implies that the solutions adopted will have to be acceptable to all groups, including (but not limited to) those that are more powerful or influential. This is in contrast to some of the literature on participatory development, which focuses primarily on elevating the voices of the least powerful. Instead, in this case, the combination of the Q methodology with a stakeholder working group helped forestall a situation where the dominant perspective became *the* answer; it instead looked for acceptable solutions for a multiplicity of viewpoints.

In turn, this kind of “indirect” solution is less likely to provoke direct opposition from groups able to stall it. While it does not change existing power dynamics, it likely does help build and strengthen working relationships among groups. This supports the contention from the literature that a strong participatory process should acknowledge power differentials without presuming to erase them (Few, 2001; Mouffe, 2005). In other

words, the goal was not simply to include underrepresented voices in decision-making (in fact some of the more underrepresented voices were not fully incorporated in the working group, although their Q factors were); rather, it was to achieve a concrete improvement that could help both marginalized and mainstream participants alike. By that criteria, this working group process was at least somewhat successful in producing an output that would be used by various stakeholders.

By explicitly acknowledging (and understanding in a concrete manner through the Q study) the differences in perspective that existed in the field of tree fruit pesticide and workplace safety, the stakeholder group could work together in a way that respected those differences but was not held hostage to them. This is appropriate in that the group was not designed, really, to change participants’ perceptions of risk; rather, it was designed to improve workplace safety *despite* differences in perspective by first focusing on areas of divergence and then dropping those in favor of more mutually palatable solutions. Based on this experience, we argue that using a stakeholder process on the heels of a Q study will not necessarily upend the fundamental power dynamics that raise concerns in the literature on participatory processes; rather, it has the potential to open additional doors to mutually acceptable solutions that might have been missed or blockaded if only the dominant perspectives on risk were addressed.

What we notice and highlight in this paper are the ways in which power and voice significantly affected outcomes within the working group, in particular through the logistical and granular details of process and participation. In other words, the working group’s process and outcomes were driven, in part, by who showed up, and the dynamics of power and voice within the group (which at times mirrored those of the larger tree fruit industry and at times diverged from them). Those dynamics, in turn, affected the contours of participation (i.e., who continued to show up) and influence all across the process. Our contention is that such granular details, which can at times go unnoticed, help enable and constrain particular outcomes in participatory work. As noted in parts of the development literature, they are key factors

to study and consider.

After all this discussion of process, however, we are still left asking whether supervisory training, as the mutually appealing solution chosen by this working group, will help improve pesticide and workplace safety in orchards. In other words, we are curious about the impacts of this project. While the creation of a supervisory skills training program does not guarantee an improvement in pesticide safety, it could help create the conditions that would promote such an improvement. A workplace culture where workers are respected because supervisors have acquired the tools to better manage work crews may easily become a safer workplace, even for the most vulnerable. If nothing else, we would argue that the pursuit of a training certificate, supported by industry personnel, advocates, and educators alike, represents a different approach to the sometimes more adversarial debates around pesticide safety risks; at the very least, it provides one strategy (among many) for broadly improving the health and safety of agricultural workers.

Finally, the core group's continued interest in pursuing this project does indicate some level of satisfaction, if not explicitly Ekboir's "mutual learning" for participants and researchers. At the time of this writing, both industry insiders and industry outsiders remain highly supportive of the project, as do some Skeptics, Acceptors, and Incrementalists. Although industry outsiders were more heavily represented early in the working group process, the inclusion of new and influential industry insiders at the last meeting (to replace a retired industry representative), has meant that the supervisory training project retains strong support from multiple communities. This broad base of support may be helpful in ensuring that this project continues.

Conclusions

In this paper, we shared results from a participatory process of stakeholder engagement around issues of pesticide and workplace safety in Washington State's tree fruit industry. Rooted in the literature on participatory development, we designed a Q study plus stakeholder working group process that would employ some "best practices" of participatory engagement to attempt a shared

power environment and improve practice, as suggested by Reed (2000) and Caretta and Riaño (2016) among others. Pulling from authors such as Smith (2008), we sought to avoid pitfalls including tokenism in participation, mistakenly viewing the community as a cohesive entity, providing inadequate resources, or inexperienced facilitation. We found that, despite seriously addressing questions of inclusion, appropriate tools, power, consensus, and time, there were certain structural constraints we experienced—from incidental things that prevented some members of the group from attending certain meetings, to the role of geography and distance in making the use of technologies such as emails necessary for coordination (but which can privilege the written word). As such, many aspects of our process reflected what has been found in the literature. A participatory process can easily fail to alter power dynamics inherent in an industry and can run the risk of replicating such dynamics even as it attempts to address them. Nevertheless, enhancing participation in decision-making while acknowledging the complex dynamics of a particular case can yield new insights and facilitate collaboration on improvements and solutions.

Our experiences with this stakeholder working group also highlighted the self-reinforcing nature of ideas, where the projects chosen were shaped by the makeup of our working group, and where those choices in turn shaped the evolving group makeup. While our stakeholder process did strive to address power inequities, it was still in large part driven by who showed up—an aspect which, itself, is a product of structure, decisions, and chance in addition to differential interest, power, and access. Decisions, and participation in those decisions, were influenced not only by an interest (or lack thereof) in certain kinds of orchard-based programs, but also by logistical issues—such as whether participants had to drive two hours or ten minutes to get a meeting, whether they had a medical urgency come up the morning of a meeting, or whether one participant was busier at work in summer while another was busier in winter. In other words, we learned that, in addition to design and implementation, logistics can matter a lot for the trajectory of a participatory process. Finally, we learned that part of a participatory process may

entail allowing participants to define their own roles. Despite researchers' goals, many participants chose not to participate at all or to come and go; these choices are reflective both of the participants' ability to access the process and the nature of their jobs and circumstances, and also their preferences for prioritizing meetings (or not) based on how relevant these meetings seemed to them. While we do not pretend to have had the full participation of all stakeholders who might have had an interest in the topic, nevertheless we contend that much can be accomplished even with imperfect participation, as long as the limits and boundaries of that participation are made clear. In our case, the development of a supervisor training certificate program would probably not have emerged without the broad participation of stakeholders. We suggest here that using a Q study to capture stakeholder representation across multiple views can be a useful approach, especially where representation by jobs or roles may prove more elusive.

In reflecting on this process and on how it draws from and potentially adds to the literature on participatory development, it is important to note that much of the literature we pulled from focuses on incorporating the views of powerless groups into research and action. Although our group included many individuals with limited power and always included representation from all three Q factors (derived from a broad array of stakeholders across the spectrum of power and position), those stakeholders with the least power in the system (presumably migrant farmworkers) were not a

central part of the working group process itself. Instead, the mixed-power nature of our group made it easier to mitigate power dynamics between researchers and participants; but, it was perhaps more difficult to mitigate power dynamics among participants. We come away from this process noting that it requires work and thought to "do" participation. Even with such work and thought, certain imbalances will affect project outcomes. In our case, as researchers and participants, we chose to follow the outcomes of our working group process in the directions they led, even as we acknowledge their shortcomings. Inspired by Walmsley (2009), we use the critiques of and lessons learned from participatory processes as a productive challenge for continuing to democratize research and social change. We also reiterate the need to continue to address, in granular detail, power differentials as a key component of equity and justice in agriculture, sustainability, and food systems. 

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Appendix A

Q statements: Viewpoints were clustered into “factors” around the extent to which participants agreed or disagreed with each of the following statements.

1. I worry that people don't take the risks of pesticides seriously because they don't understand the long-term effects of pesticides on their health.
2. I don't think anybody really knows what all of these pesticides are doing to our environment.
3. Unlike many people, I believe that if there is any possibility of a pesticide harming the environment or human health, that chemical shouldn't be used even if it's not yet absolutely proven scientifically to be harmful.
4. I am convinced that people are afraid of pesticides basically because they don't know enough about the pesticides themselves.
5. It frustrates me that the public simply does not understand how agriculture works today.
6. I don't know why people get so worried about pesticide use in orchards—there are good systems in place for monitoring pesticide illness and they indicate really low levels of exposure.
7. I don't trust official assessments of pesticide health risks—they're measured by exposure to a single chemical, but pesticides are typically used in formulations (mixed with other chemicals).
8. I'm not naïve enough to believe that all pesticides are safe.
9. I can tell by the odor whether or not a pesticide is dangerous.
10. I believe that scientists receiving industry funding tend to be biased towards industry interests even in cases where the industry sponsor does not actively pressure the researcher.
11. I don't have any questions about which chemicals are safe and which are not—the science of pesticide safety is has been clearly studied.
12. Many of the pesticides we use now are very targeted—they're not broad-spectrum neurological toxins so short of being a fungus or bacteria, they're not going to have much effect on you.
13. I am tired of all the regulation around agricultural pesticides.
14. I don't think it makes sense to worry too much about pesticide drift—pesticides are so diluted by the time they're used that they're not going to hurt you.
15. I'm all for workplace safety, but without pesticides, you just can't produce the safe, nutritious, affordable food that consumers deserve.
16. I worry about children's exposure to pesticides (even in utero) because it can lower their IQ.
17. It frustrates me that literacy, cultural, time, and language barriers get in the way of appropriate pesticide safety training for workers.
18. No matter what people say, I know that pesticide drift is very common.
19. What pesticide handlers need to be safe in my opinion is more label information in Spanish.
20. I think there should be a program whereby all pesticide applicators, when they go out to spray, are given refresher explanations on what chemicals they are using, what the labels say, and how they should be used.

21. I know that pesticide applicators, because they're spraying all the time, understand pesticide safety—but not everyone else knows what's going on, and that can make things risky.
22. It frustrates me to no end that the health dangers of pesticides are grossly overstated by politicians using the issue as a political vehicle.
23. In my experience, tree fruit workers receive plenty of pesticide safety training.
24. I feel very comfortable with how well pesticide handlers know how to read and follow pesticide labels.
25. I wish managers would do a better job of reminding pesticide handlers about maintaining a safe workplace.
26. If there were clear and open communication within orchards, pesticide safety would be less of an issue.
27. I think growers and managers are generally good listeners, responsive to their workers' concerns—but workers have to be willing to talk to them if they are worried.
28. What I think supervisors need is training in human resource management—how to be more effective and more efficient, with the skills and abilities to communicate things to their employees.
29. I think a big problem in the system is that pesticide safety varies so much by orchard—some enforce safety procedures really well and implement a culture of safety while others don't.
30. I hate when pesticide handlers don't get enough time to decontaminate personal protective equipment.
31. To me it's simple—as long as people follow regulations and don't go into sprayed blocks, there is no safety risk.
32. In my opinion, the tree fruit industry overprotects its workers.
33. I can hardly believe how much safer orchards are now than they were 5–10 years ago.
34. For me, industry self-regulation is the best way to addressing environmental problems like pesticide safety.
35. To me, pesticide handling is only risky when applicators don't wear the proper personal protective equipment.
36. I don't understand why pesticides that can be replaced by less toxic alternatives are still registered.
37. I don't think that growers would train workers on pesticide safety unless it were regulated.
38. In my experience, posting signs for re-entry intervals is not effective—many places keep their signs up all year, so you can't rely on them.
39. I'm tired of this overwhelming focus on pesticide safety—there are simply way more pressing safety issues in orchards today.
40. I trust that the USDA and EPA wouldn't allow pesticides to be used that aren't safe for humans.
41. I believe there's inherent risk involved in working with pesticides, no matter what precautions are taken.
42. Improving pesticide safety is simple—all it needs is for the tree fruit industry to step up and put some money behind it.
43. I believe that true safety comes not from worker protections but from engineering workers out of the loop.
44. I'd like growers to spray less toxic pesticides, but the cost of them is getting out of control, especially for family farmers.
45. To me, pesticide safety has become a non-issue—employers already have to address it for food safety certification.

Appendix B

Draft outline of proposed training certificate program created by stakeholder working group and designed to provide opportunities for tree fruit industry supervisors to improve some of their workplace safety climate by strengthening supervisory skills.

Proposed Core Training Subjects	Including...
1. Human Resource Management	Hiring/firing/promoting Evaluating employees (informally and formally) Professional communication <ol style="list-style-type: none"> a. Respectful communication around wage rates b. Cross cultural awareness, including terminology changes from orchard to orchard c. Approaches to navigating and explaining rules and their rationale Respect/ethics <ol style="list-style-type: none"> a. Addressing issues of concern raised by migrant pickers and other employees including favoritism; "culture of retaliation"; "vulgarity"; discrimination and violence Managing conflict Leadership/motivation
2. Regulations	Specific to: <ol style="list-style-type: none"> a. Tree fruit industry b. Human resources c. Employee safety d. Food safety
3. General Operations	Safety 101, including: <ol style="list-style-type: none"> a. Safety leadership: modeling, promoting, accident prevention programs b. New employee orientations c. Company safety policies Economics/Costs 101 (for small and larger operations) <ol style="list-style-type: none"> a. Process, expectations, communicating needs to upper management b. Enhancing productivity

Potential Specializations (Tracks)

Managing across languages

Tractor safety

Sprayer calibration

Budgeting

Literacy

Respirators and personal protective equipment

Developing an accident prevention program

A case study of transitions in farming and farm labor in southwestern Idaho

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Abstract

Farm labor in the U.S. is undergoing significant transitions. First, fewer farmworkers are migrating in the traditional sense, and more are settling in to rural American communities. Second, more women are working in agriculture—a process referred to as the feminization of agriculture. Third, there has been an increase in so-called “recreational” crops like marijuana and hops grown for craft microbrew beers. This paper discusses these three transitions in Southwestern Idaho. These transitions were observed during pilot research conducted in Idaho during 2017–2018. We present this paper as a case study of current transitions in American agriculture.

Keywords

Migrant Farm Labor, Feminization of Agriculture, Recreational Crops, Farmworkers, Idaho

Introduction

When one imagines the face of a farmworker in the United States, the image is typically a Latino man who migrates from field to field following seasonal crops. He is generally perceived of as a hardworking man, willing to do the job that “no American wants to do.” However, this popular cultural imaginary may no longer hold true. The reality is that farm labor in the U.S. is undergoing significant transitions. Fewer farmworkers are migrating in the traditional sense, and more are settling in rural American communities. More women are working

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in agriculture, and there has been a rise in so-called “recreational” crops like marijuana, and hops grown for craft microbrew beers.

Our pilot research has frequently illustrated these transitions. In this case study, we discuss these transitions in agriculture and specifically focus on how they are manifesting in Southwestern Idaho. We further discuss the ways in which these transitions interact and influence the well-being of farmworkers in the region, particularly women. While the data collection for this project is preliminary, the findings concerning these transitions constitute, in and of themselves, a contribution to the literature on agriculture, food systems, community development, and farmworker well-being. Further, we believe that it is critical that these findings are shared with researchers and practitioners because the transitions we highlight are occurring at a rapid pace. Importantly, we believe that the transitions are interrelated, and at the end of the paper, we address the need for additional research that considers gender, immigration status, and crop type as interrelated dynamics. We hope that this article will inspire similar research in different settings. This would allow us to compare patterns, similarities, and differences in the American West across the U.S., and even globally.

Background

In December 2016, we began conducting research with Idaho agricultural workers to learn more about the challenges they face in maintaining their well-being. We focused our pilot research on food security, food provisioning strategies, housing, transportation, and employment opportunities for farmworkers. During the course of this pilot research, we noted several significant transitions underway in Idaho. In particular, we noted that there was:

1. A decrease in the number of migrant farmworkers with a corresponding increase

in Latinx¹ farmworkers who are permanent or long-term residents of Southwestern Idaho;

2. An increase in the number of women working in agriculture; and
3. An exponential growth of hops farming in Southwestern Idaho.

In this paper, we discuss these transitions, including how they interact, in the context of Idaho agriculture today. First, we discuss the field site and our methods.

Field Site: Southwestern Idaho

Southwestern Idaho is an ideal site for our research for a number of reasons (Figure 1). The area is host to a unique set of demographic features. The Boise greater metropolitan area (BMA) is home to over 700,000 people (all population estimates are from U.S. Census are for 2017). The vast majority of the population lives in Boise (226,570), Meridian (over 95,000), and Nampa (91,000). Caldwell is the largest town at the fringes of the metro area (over 50,000 in 2017) (United States Census Bureau, 2018).

Demographically, the BMA is quite segregated by race and ethnicity. While the state of Idaho is 13% Hispanic, the majority of the Latinx population lives on the outskirts of the BMA (Figure 2). In Ada County, which includes Boise and Meridian (the two largest cities in the state), just 7% of the population is Latinx. However, in neighboring Canyon County, where we have focused our research, 25% of the population is Latinx. In the town of Wilder (which is in Canyon County and is an area of significant hops production), the population is 75% Latinx.

Methodology: A Grounded Theory Approach

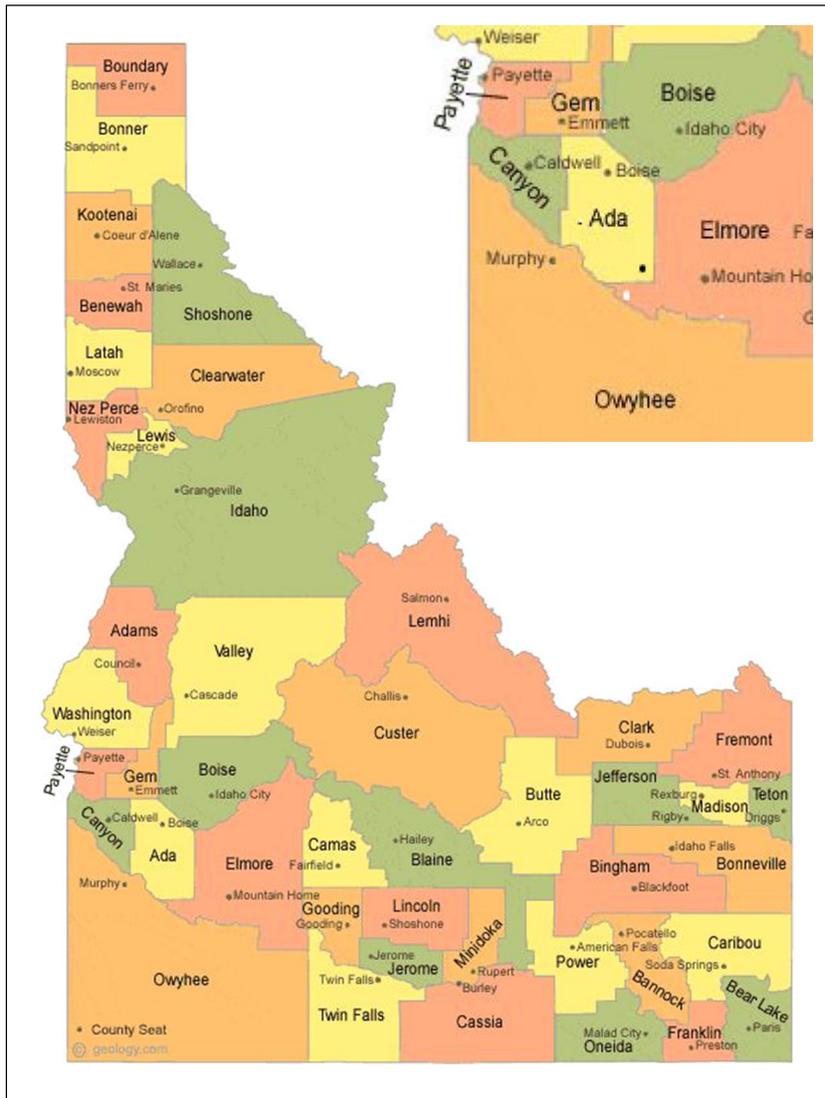
We have utilized a mixed methods approach for this research. First, we reviewed existing data on farmworkers in Idaho. We then held two meetings

¹ In this paper, we utilize Latinx, a contested term that is used in both academic writing and in U.S. society more broadly as a gender-neutral version of Latino/a/@ (Guidotti-Hernández, 2017). We also use the term Hispanic whenever the source we are citing uses the term Hispanic. In Idaho, many people use the term Hispanic rather than Latina/o/x, but they are used synonymously in this paper. Lastly, when we are referring specifically to those who identify themselves as women of Latin American descent, we use the term Latina.

with a farmworker advocacy organization in the region and subsequently engaged in several field site visits, including five visits to hops farms in Southwestern Idaho. These farm visits involved making observations of the farms and the farmworkers and having informal conversations with contractors and farmworkers. We also worked alongside farmworkers, including during planting and harvesting season. In addition, we conducted

six extended interviews with (1) leaders of non-profit organizations advocating for farmworker well-being in the region, (2) farmworker labor contractors, (3) supervisors, and (4) farmworkers.² Finally, we collected survey data from 30 Latinx farmworkers. Surveys were completed at two Head Start parent support meetings, one in March 2017 and one in April 2018.

Figure 1. Map with Inset of the Regional Focus Area of the Present Study



Source: Geology.com

All ethnographic and survey data were collected after securing approval through the Boise State University Institutional Review Board. Interviews lasted between 60 and 90 minutes and were conducted in locations comfortable for the participants. Interviews occurred within the homes of research participants. All interviews were audio-recorded and then transcribed. Interviews were conducted in English or Spanish depending on the preference of the research participant. All interviews were transcribed in both English and Spanish.

Throughout our pilot research, we utilized a semi-grounded theory approach; while some existing theory and data guided our questions and the findings we anticipated, we also went into pilot research with a desire to collect qualitative data to help us understand certain themes that are relevant and important to farmworkers themselves. In this paper, we are not focused on reporting the findings of our data; rather, we aim to discuss the transitions outlined above using this data to support and/or provide a greater description of these transitions.

² Survey respondents include farmworkers of any type (not limited to hops workers). Most farmworkers in this region work a variety of crops, including, hops, onion, mint, dairy, corn, grapes, and potatoes.

Three Significant Transitions

Our pilot fieldwork revealed three important trends that we thought were worthy of further exploration. We discuss each transition in detail below and describe the ways in which these transitions build upon each other to influence the well-being of farmworkers in Southwestern Idaho.

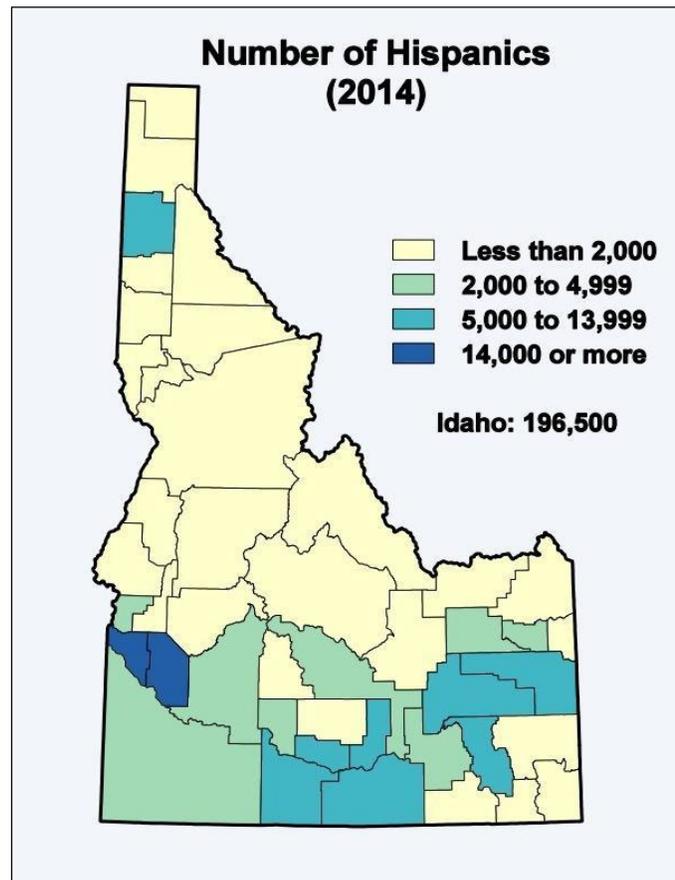
Transition 1: The Settling-in of Latinx Farmworkers

The first transition we discuss here is a potential decrease in the migration of farmworkers in the region, with a rise of farmworkers settling in. Here, we are referring to migration in the traditional sense (e.g., traveling back and forth to Mexico on a seasonal basis or between agricultural locations in the U.S.). A farmworker being 'settled' is defined by the USDA as working at a single location within 75 miles (121 kilometers) of their home (U.S. Department of Agriculture, Economic Research Service [USDA ERS], 2018).

The numeric decline in migrant farmworkers has been observed across America; many agricultural workers now live permanently near their work sites (Fan, Gabbard, Alves, & Perloff, 2014). Seventy-five percent of all farmworkers now live within 25 miles (40 km) of their work site (USDL, 2016). However, there are little data regarding the degree to which farmworkers have settled in into rural communities in Southeastern Idaho. From our observations and interviews, however, it does appear that farmworkers are increasingly settling in in the region.

There are several reasons why more Latinx farmworkers are settling in to rural communities such as those in Idaho. Border crossing became much more difficult and dangerous in the early 1990s, a result of the "Prevention through Deterrence" border security policy (Cornelius, 2004). This has likely influenced the degree to which farmworkers decided to settle in rural communities or migrate. In the region of Idaho where the hops industry is booming, the vast majority of Latinx families moved into the area prior to the 1990s. According to recent studies, 70% of Hispanics living in Idaho were born in the U.S. (University of

Figure 2. Number of Hispanics, by County, in Idaho, 2014



Source: University of Idaho McClure Center for Public Policy, 2016.

Idaho, McClure Center for Public Policy Research, 2016). For the 58,900 foreign-born Hispanics in Idaho, 64% arrived in the U.S. before 2000 (University of Idaho, McClure Center for Public Policy Research, 2016). Another 30% arrived during the 2000s, and 6% arrived in 2010 or later (University of Idaho, McClure Center for Public Policy Research, 2016).

Interestingly, much of the research on settling-in refers to such communities as "new immigrant destinations." Schmalzbauer (2014) identifies Idaho as a "new migrant destination." These are defined as "dynamic, growing economies that have spurred population growth of the native-born as well as of migrants" (Schmalzbauer, 2014, p. 7). What this research does not always consider is the ways in which Latinx incorporation is experienced in metropolitan regions, or in communities that have historically had migrant workers.

As the number of migrant farmworkers declines and more farmworkers settle permanently in rural Idaho, there are important socio-demographic and political considerations. As noted above, in Canyon County, Idaho, where the majority of hops production in the state occurs, the population is 25% Hispanic, the highest Latinx population in the state (US Census Bureau, 2018). With changing demographics, the political landscape can shift. As portrayed in a story on National Public Radio, Wilder, Idaho, is the first city to elect an all-Latinx city council (Rott, 2015). The demographic shifts in rural Idaho are in line with national trends. In the 1990s, there was significant growth of the Latinx population across rural America (Kandel & Cromartie, 2004).

Within most, if not all, rural communities where Latinx farmworkers are settling in, economic and social inequalities persist. For example, rates of health insurance are significantly lower for Latinx members of rural communities, especially those communities considered to be new migrant destinations (Monat, 2017). Further, there is known rural income inequality (Parrado & Kandel, 2010). Latinx children born in rural America are more likely to be impoverished than Latinx born in cities (Wiltz, 2015). There is a wide body of literature that looks at rural and Latinx inequalities. While we do not have the space to review all the literature here, it is important to note the intersectionality between race and geography. Southwestern Idaho is considered to be an “established Latino population” (Crowley, Lichter, & Turner, 2015, p. 83). Overall, established rural Latino communities fare better economically than “new” Latino destinations. However, there are still high rates of poverty. In 2010, poverty rates for established Latino communities were, on average, 26.3% for individuals, 23.4% for families with children, and 56.5% for female-headed families (Crowley et al., 2015, p. 84). The latter statistic demonstrates the ways in which race, gender, and geography intersect.

Lastly, it is important to consider citizenship status among rural Latinx farm-working populations. At the national level, approximately half of farmworkers do not have work authorization. In other words, they are undocumented workers. In Idaho, that number is estimated at approximately

45,000 individuals, composing just over 40% of the agricultural workforce (Pew Research Center, 2016). However, since 2001, the rates of citizens working in agriculture has increased from 23–27% (U.S. Department of Labor [USDOL], 2001; USDOL, 2016). Another way that farmworkers obtain authorization to work in the U.S. is through the H-2A temporary work visa program. The number of H-2A workers has increased dramatically since 2015. According to one local source, applications for H-2A workers increased by 32% between 2015–2017 (Ellis, 2017). Our pilot research confirms this trend: farm operators are increasingly looking to the H-2A program to fill labor needs. It will be interesting to observe this trend over the next few years: an increasing reliance on the H-2A program in the region could shift the dynamics of farm work back toward immigrant labor.

Immigration status influences access to safety nets, particularly the Supplemental Nutrition Assistance Program (SNAP) (often referred to as “food stamps”). This influences the social experiences of farmworkers in rural communities and may also limit opportunities for community organization (Carney, 2015; Crowley & Ebert, 2014; Holmes, 2013). Thus, measures that could ease some of the mental, emotional, financial, and physical burdens for Latinx farmworkers may be inaccessible to them, particularly those who are low income and those who are not documented. Research also suggests that these conditions, including the lack of financial or physical access to food and lack of documentation, may lead Latinx farmworkers to use alternative forms of food provisioning (e.g., community gardens) (Minkoff-Zern, 2014).

There are a number of important considerations related to farmworker well-being, especially for farmworkers that have settled in. Housing is one such issue. While housing for migrating farmworkers is an issue of great concern with regard to health and well-being, it is also a concern for those who are living permanently in a community. Many of the women and families we interviewed and surveyed during our pilot research live in low-income housing. Some farmworkers live in USDA subsidized “labor camps.” These are housing projects developed in the 1940s by the USDA as a way to increase seasonal farm labor in

rural locations. They were traditionally filled with temporary workers from Mexico. Today, however, the camps serve as low-income housing in rural Idaho. The camps are still subsidized by the USDA, although some have opened to non-agricultural low-income families.

While many of the inequalities that Latinx farmworkers face persist, there are several positive outcomes related to the increasing number of Latinx farmworkers settling in is the rise in the number of minority principle operators (Figure 3). Nationally, Hispanic-operated farms increased by 21% between 2007 and 2012.³

A recent analysis suggests that the trend of fewer migrant workers has several implications. Fan and Perloff (2016) argue that, “farmers have responded to the reduction of migrants in several ways. They have changed cropping patterns, worked harder to retain workers, made jobs more attractive to female workers, adopted labor-saving technologies, and increasingly turned to guest worker programs” (p. 7).

The next sections explore two of these phenomena in greater depth: the increase in female farmworkers and changing crop patterns.

Transition 2: The Feminization of Farm Work in Idaho

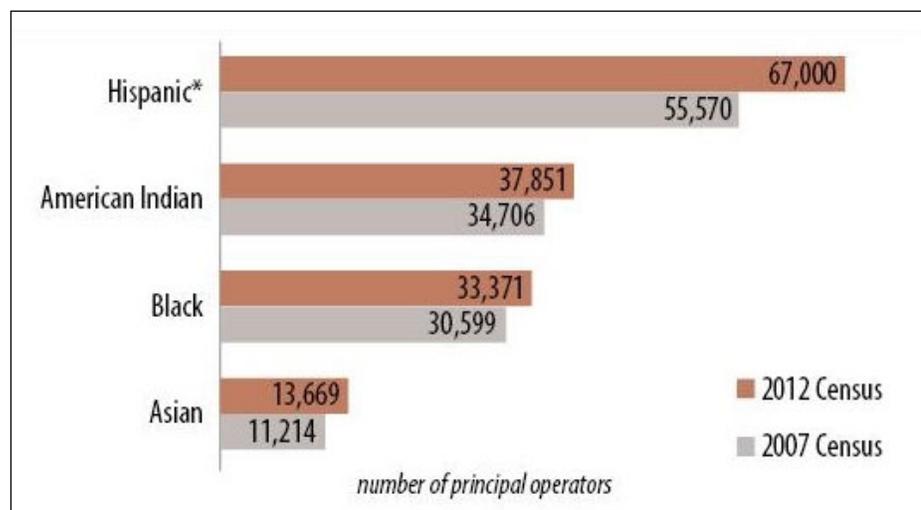
The second transition we observed in our fieldwork was a feminization of farm work in Southwestern Idaho. Women represent an increasingly large percentage of the agrifood labor force in the U.S.

and beyond. This phenomenon is often referred to as the feminization of agriculture (Lastarria-Cornhiel, 2006). We begin with a discussion of the increasing role of women at the national level. We then dig deeper into this transition in Southwestern Idaho.

Nationally, the feminization of agriculture is evident at the level of farm operators. Looking at USDA Census of Agriculture data from 1978 to 2012 on the number of female farm operators per year (Table 1), we found clear evidence that more women are working in agriculture. In our analysis, the rate of change was aggregated according to farm size (following USDA standards for Gross Cash Farm Income). There was a clear increase in the ratio of female farmers across all farm sizes (Figure 4).⁴ However, this rate of change was most pronounced among small farms.

The feminization of agriculture in Idaho can also be seen at the level of the farmworker. Compiling data on gender from the National Agricultural Workers Survey (NAWS) between 1998 and

Figure 3. Change in the Number of Minority Principal Operators, 2007 and 2012



Source: U.S. Department of Agriculture National Agricultural Statistics Service, 2014.

³ Minority farms fall disproportionately into the “farms with sales less than US\$10,000” category.

⁴ USDA Glossary defines farm operator as the person who runs the farm, making the day-to-day management decisions. The operator could be an owner, hired manager, cash tenant, share tenant, and/or partner. If the land is rented or worked on shares, the tenant or renter is the operator. In the recent Census of Agriculture and in the Agricultural Resource Management Survey (ARMS), information is collected for up to three operators per farm. In the case of multiple operators, the respondent for the farm identifies who the principal farm operator is during the data-collection process.

Table 1. Change in the Percentage of Female Principle Operators, by Farm Size, Reported in the Census of Agriculture, 1978–2012

Year	Acreage	Farm Size	Female Operators	Male Operators	Percent Female	Percent Male
1978	1–499	small	715	19,964	3.46%	96.54%
1978	500–1999	mid	78	4,334	1.77%	98.23%
1978	>2000	large	25	1,239	1.98%	98.02%
1982	1–499	small	866	18,371	4.50%	95.50%
1982	500–1999	mid	89	4,024	2.16%	97.84%
1982	>2000	large	21	1,239	1.67%	98.33%
1987	1–499	small	1,020	17,670	5.46%	94.54%
1987	500–1999	mid	107	4,030	2.59%	97.41%
1987	>2000	large	26	1,283	1.99%	98.01%
1992	1–499	small	1,212	15,851	7.10%	92.90%
1992	500–1999	mid	137	3,657	3.61%	96.39%
1992	>2000	large	39	1,237	3.06%	96.94%
1997	1–499	small	1,537	15,745	8.89%	91.11%
1997	500–1999	mid	165	3,616	4.36%	95.64%
1997	>2000	large	47	1,204	3.76%	96.24%
2002	1–499	small	10,092	21,036	32.42%	67.58%
2002	500–1999	mid	1,172	4,072	22.35%	77.65%
2002	>2000	large	418	2,072	16.79%	83.21%
2007	1–499	small	11,383	21,467	34.65%	65.35%
2007	500–1999	mid	1,171	3,898	23.10%	76.90%
2007	>2000	large	466	2,042	18.58%	81.42%
2012	1–499	small	11,551	21,366	35.09%	64.91%
2012	500–1999	mid	1,281	3,917	24.64%	75.36%
2012	>2000	large	513	1,962	20.73%	79.27%

Note: 1 acre=0.4 hectare

2014, we see a similar, clear increase in the percentage of women working in agriculture.

While at the national level males still make up 72% of the crop labor force (USDAL, 2016), this high proportion of male workers does not match our initial observations of labor in the hops industry in Southwestern Idaho. During pilot research, we observed that women make up approximately half the hops workforce. Further, while there does appear to be some gender-segregated work in hops agriculture, we have observed and talked with women at all levels of hops agriculture, ranging from supervision, planting, repairing wires, driving tractors, and processing ripened vines of hops cones.

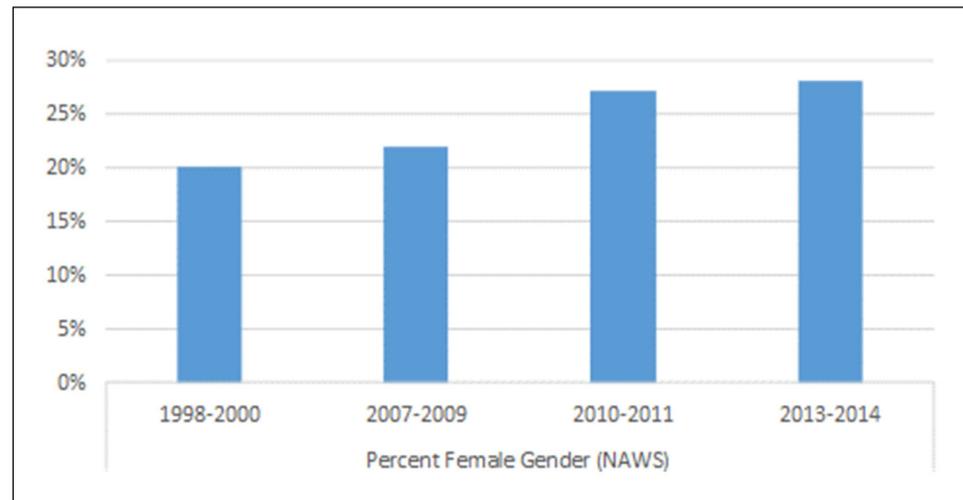
When we asked our research participants about the presence of women in the hops fields, many asserted that women possess qualities that make for good agricultural workers, including strong work ethic, reliability, and the ability to perform high-level precision labor. Looking at existing literature, there are multiple likely explanations for the increasing role of women in Idaho agriculture. One common explanation is that women provide a flexible labor force. The defining characteristic of the new female wage labor in Latin America and Africa is its “flexible” labor force—seasonal, temporary, or casual women workers—with an underpinning of a small, permanent, and largely male labor force. Because the world market for

vegetables, fruit, and other fresh products such as flowers is very competitive, agribusiness seeks a flexible labor force that works long hours for only part of the year while receiving low wages and no social benefits (Lastarria-Cornhiel, 2008). The BMA is one of the fastest growing regions in the country. We found that such economic and population growth can lead to a rise in sectors of the economy such as construction that may pull men who have traditionally worked as farmworkers away from farm jobs, thus leaving opportunities open to women that had previously been closed to them.

The feminization of farm labor raises some important socio-cultural questions, including questions related to well-being. For instance, findings from our pilot research indicate that there are several specific concerns related to women farmworkers and their ability to provide food for their families (Meierotto & Som Castellano, forthcoming). Many of the women we talked to during our pilot research experienced some degree of food insecurity; in fact, 50% of respondents reported some degree of food insecurity. Farmworkers and their families also struggled with access to high-quality food given their geographic isolation. Over 75% of our study group felt they lacked sufficient money to buy the kinds of food they would like to buy.

Childcare is also an area of focus given the feminization of farm labor. As more women enter the workforce, and in particular as they work in temporary seasonal labor, child care is a pressing issue. Many of the farmworkers we have interviewed and surveyed depend on local Head Start programs for childcare. Other families mentioned relying on relatives, neighbors, and older siblings for childcare.

Figure 4. Percentage of Female Farmworkers, U.S., 1998–2014



Data source: U.S. Department of Labor, 2016.

There is inadequate provision of childcare, preschool, and kindergarten across the board in Idaho. Less than 30% of three- and four-year-old children are enrolled in preschool, the lowest percentage of all states, and Idaho is one of 7 states that does not offer public preschool (National Institute for Early Education Research, 2017).

Farmworker mothers face additional barriers when it comes to providing education for their children. Rates of kindergarten preparedness are influenced by race and ethnicity: 54% of all Idaho kindergartners were ready for kindergarten, compared to just 29% of Hispanic kindergartners (Idaho Business for Education & J. A. and Kathryn Albertson Foundation, 2015). By many measures, there is a pronounced “ethnicity achievement gap” in Idaho, with Hispanic students performing lower than non-Hispanic students on a variety of tests (Idaho Business for Education & J. A. and Kathryn Albertson Foundation, 2015). Largely an outcome of inequality in school funding, lack of quality education adds to the physical and psychological burdens of Latinx farmworkers in the region. For example, one mother described sending her child to the school in a nearby town, rather than the closest school, in order to provide her child with a better education. Of course, this added to her daily burdens and complicated her ability to work.

With the feminization of farm labor, we can anticipate a deterioration of workplace conditions

(Lastarria-Cornhiel, 2006). For instance, it is well established that women typically earn lower wages than men; moreover, female labor is often viewed as temporary. We have observed this trend in Idaho; as more men find full-time, year-round employment in other sectors like dairy or construction, women have taken on more of the temporary, part-time jobs prevalent in seasonal agriculture.

The feminization of agriculture raises other questions related to well-being for women farmworkers in the region. For instance, studies have shown that women face an increased risk of pesticide exposure (Wasserman, 1999). This is due to the fact that agricultural equipment, protective wear protocols, and training regimes are typically designed for men (Andersson & Lundqvist, 2014; Wasserman, 1992). International research has shown that women in the agricultural labor force experience different—and typically increased—job hazards compared to their male counterparts, particularly those related to pesticide exposure. A study of work-related pesticide poisoning among farmers in southern China found that pesticide poisoning was more common among women (Zhang et al., 2011). In another study, over 70% of female Ecuadorian workers reported that they had not been trained to wear protective gear or that their protective gear was too large (Arcia et al., 1993).

Recent research in the southeastern U.S. also suggests cause for concern regarding pesticide exposure among female farmworkers. Arcury et al. (2018), analyzed pesticide metabolites in 31 Latina farmworkers in North Carolina. These workers had significantly higher concentrations of most organophosphate (OP) metabolites than were reported for women or Mexican Americans who participated in the National Health and Nutrition Examination Survey (NHANES) for any year for which data are reported. Similarly, in a 2013 study of OP exposure among 47 Latina nursery workers in Florida, total OP metabolite levels were significantly higher among the workers than among a control population of women not involved in agricultural work (Runkle et al., 2013). To our knowledge, no data are available on pesticide exposures among Latina farmworkers in the Mountain West. Because pesticide use patterns vary widely by region and crop, this is a significant data gap.

Transition 3: Rise of Hops Production in the BMA

The third transition we discuss is an increase in hops agriculture in Southwestern Idaho. When we began our research in the region, it became immediately evident that hops production was increasing. Production of hops requires the installation of significant infrastructure, and we observed the large poles required for hops production being installed in many fields that had historically been planted in other crops, primarily onions. Many people with whom we spoke discussed the significant increase in hops production in the region, but also emphasized that this region had been producing hops for many years.

Our observations are confirmed with recent data from the National Agricultural Statistics Service (USDA NASS, 2018). According to the USDA NASS, there has been an 18% increase over 2017 in acres of hops production in Idaho; Idaho farmers added 1,224 acres (495 hectares), and Idaho is now the nation's number two hops-producing state, both in terms of acres planted and in total volume of production (USDA NASS, 2018). The largest hops producing county is Canyon County, which is located in the BMS (Lowe, Holley, Islam, Sandow, & Hurt, 2016). Thus, while craft brewing has become an important part of the cultural landscape in the Northwest, it is also an important component of the regional economy. Idaho hops production in 2015 was valued at US\$30.8 million (USDA NASS, 2016).

One of the drivers of the agricultural shift to hops in Idaho is consumer demand for craft microbrew beer. According to the National Brewers Association (n.d.), craft beer sales made up more than 23% of the U.S. beer market in 2017, making craft beer an increasingly popular commodity across the U.S. This rise in craft beer consumption has also changed the landscape for hops production, as it has required a greater amount and variety of hops to be produced.

Climate change and land use change are also potential drivers of increased hops production in the region. As noted above, the BMA has one of the fastest-growing populations in the country, and considerable land conversion has been taking place in the region. Land use conversion from agriculture

to development can make it more difficult to farm; it can also increase the price of land, thus influencing a farmer's decision-making regarding what to do with their land and agricultural operation in the future. In the short term, hops can make more money on smaller plots of land than other crops. It also requires less large machinery. Further, water use is of particular concern in the region, and is related to urban growth, land use conversion, and climate change. Some believe that the conversion to hops production has been motivated not only by economic conditions but also because of potential water scarcity. While the region has traditionally made use of flood irrigation, many farmers are transitioning to drip or pivot irrigation; hops are a crop that thrives on drip irrigation, a potentially motivating factor for some to switch to hops production.

The increase in hops agriculture raises a number of important questions regarding farm work in the region. First, hops are a highly labor-intensive crop that requires precision and highly skilled farmworkers. Given this, and the fact that new jobs have arisen for many farmworkers in the region because of population growth and the booming economy, finding sufficient farmworkers for this skilled labor may be (or become) an increasing challenge for hops growers in the region. Yet working in the hops fields has been reported as preferable to working in other crops in the region, such as onions. We have been told that working in hops production offers higher wages and that there is more work throughout the year; in other words, it is less seasonal. However, there is no current research in the region on consumer knowledge of or attitudes towards local farm work conditions, particularly as it relates to the production of locally produced crops. Further, there is little to no organic hops production in Idaho. For example, there are no farms in Idaho listed by the American Organic Hop Grower Association (AOHGA, n.d.). An Idaho Preferred blog post from 2014 noted that there were 60 acres (24 ha) of organic hops in production (Idaho Preferred, 2014). Historically all of the hops produced regionally has been distributed through international distribution channels. However, it appears, at least anecdotally, that there is starting to be some increased interest or

movement toward making use of local hops in the region. Recently, a few local breweries have started to highlight local hops in the production of select brews. While the debate about the benefits and drawbacks of special labeling schemes continues, it is possible that a fair-worker hops label could improve the living and working conditions of farmworkers laboring in hops in the region.

Discussion and Conclusion

In this paper, we have discussed transitions underway in agriculture and farm work in Southwestern Idaho, paying particular attention to how these transitions may influence the well-being of farmworkers. Due to their geographic, cultural, and economic isolation, concerns about the health and well-being of farmworkers are often overlooked. When attention is paid to farmworkers, it is often focused on young, male, migrant workers. Yet, in many regions, the realities of farm work, both in terms of who is doing the work and what the work looks like, may be changing. It is important to be attentive to these changes and to understand how transitions in agriculture and farm work may be intersecting, and influencing the well-being of those who work so hard to produce food and drink. The transitions described above provide insight into the ways in which agriculture and farm work in the region are changing and highlight some of the ways in which the lives and well-being of farmworkers may be influenced.

To conclude this paper, we offer a list of research questions relevant to each of the transitions discussed in the case study.

- (1) Future research should closely examine the increase in farmworkers settling in the region. For example:

How does well-being vary based on whether farmworkers in the region are settled in, relative to those who are migrating?

What socio-, economic, or political challenges do settled Latinx farmworkers face?

Do the current political climate and immigration policy proposals influence the plans of farmworkers

who have settled in in the region? How does this vary based on generation, country of origin, and citizenship status?

- (2) Future research should determine if there is a quantitative increase in women working in agriculture, not just in Idaho, but also across the United States. Further, the feminization of agricultural labor in Idaho raises a number of questions regarding farmworker well-being. For example,

How do the risks of pesticide exposure differ between women and men farmworkers?

What safety risks exist for women working in the fields? For instance, is safety equipment available in women's sizes?

Do women farmworkers face additional challenges in ensuring well-being for their families?

Are there different ways that women farmworkers need social support—such as with child care, grocery store access, and flexible working hours?

- (3) We suggest a wider study of labor in hops agriculture across the Northwest. Questions to consider include:

Do farmers report changes in the labor force who are working in hops production?

What challenges do farm owners face with regards to labor in their operations?

- (4) Lastly, we propose additional research on beer consumers, especially in the Northwestern U.S. For example:

Is there an awareness among microbrew consumers that hops are a labor-intensive crop?

Is there an interest in pursuing fair-trade, organic hops among local consumers?

What might this mean for hops workers?

We believe that a focus on the research questions listed above will help both scholars and policy-makers better understand the trends in farming and farm labor. In particular, we believe that gender needs to be given greater attention in future research on farmworkers. In a concurrent research project, we find that many of the challenges women farmworkers experience, particularly those related to food provisioning, are related to the intersections between socioeconomic status and the form of labor in which they engage (Meierotto & Som Castellano, in press). We hope that this case study inspires and shapes future research on transitions in agriculture in the American West, across the United States, and globally. 

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Stakeholder perceptions of the impact of cannabis production on the southern Oregon food system

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Abstract

The passage of Measure 91 (Oregon Legalized Marijuana Initiative, 2014) in Oregon legalized the production of cannabis for recreational sale. Since legalization, there has been a significant increase in cannabis production across the agricultural landscape of southern Oregon. Southern Oregon's Rogue Valley now hosts 314 licensed recreational

cannabis growers who share a changing agricultural landscape with orchards, vineyards, vegetable farms, seed industries, and ranches. The Rogue Valley Food System Network (RVFSN) convened focus groups across the region to explore the perceived impacts of the cannabis industry on the food system. These impacts were coded and categorized for use in the development of future research questions. Stakeholders identified environmental impacts, land use policy, agricultural best practices, water resources, financial opportunities,

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resource competition, and a changing cultural landscape as areas in need of further research. This research brief informs work by lawmakers, land use planners, researchers, managers, and farmers in developing research, policies, and projects to address challenges and realize opportunities associated with the changing agricultural landscape in states where cannabis production is expanding.

Keywords

Marijuana, Cannabis, Food Systems, Oregon, Rogue Valley, Agriculture

Introduction

The production and commercial sale of cannabis in the United States has increased significantly over the past decade (Stoa, 2017), due in large part to individual states passing laws that legalize cannabis. Oregon was the first state to abolish criminal penalties for possession of cannabis, in 1973 (Blachly, 1976). Then, in 1996 California became the first state to legalize medical marijuana. Two years later, Oregon, Alaska, and Washington followed suit. Oregon's Medical Marijuana Act (1998) specifically allowed for the cultivation, possession, and use of cannabis by those in possession of a medical marijuana card issued by a doctor.

Washington and Colorado were the first states to legalize recreational use of cannabis, in 2012. In 2014, Oregonians passed ballot initiative Measure 91 by 56% of the vote, legalizing the cultivation and non-medical use of cannabis (Oregon Legalized Marijuana Initiative, 2014). That same year, Alaska also legalized the recreational use of cannabis, with California following in 2017. Today 31 states and the District of Columbia have legalized medical marijuana, and nine states and the District of Columbia have legalized recreational marijuana, with an additional 15 states exploring recreational cannabis laws.

There are both potential risks and opportunities associated with the emerging cannabis markets. These include an increased flow of cash into a community (Victory, 2014), an increase in property values (Victory, 2014), the development of large-scale farming operations (Heimlich & Anderson, 2001), the creation of cannabis appellations (legally defined and protected geographical

indication used to identify where a crop is grown) (Stoa, 2017), and competition for natural resources (Bauer et al., 2015; Stoa, 2017; Vana, 2016).

In certain cases, cannabis cultivation poses significant threats to the health of watersheds. Stream diversions that may increase erosion may be used for flood irrigation on large outdoor farms. Some cannabis farms are also illegally removing irrigation water from streams and other water sources (Vana, 2016), which may lower the water table and affect summer flows for fish runs. A study of the Eel River watershed in California concluded that cannabis operations without regulation could outstrip water supplies (Stoa, 2017). However, correct implementation of farming policies would retain the ability to effectively regulate water usage (Stoa, 2017).

Federal restrictions on cannabis complicate other aspects of production and distribution as well. For example, because it is an illegal activity at the federal level, banks are prohibited from taking money from the cannabis industry. Therefore, depositing revenue earned from cannabis production poses a risk not only to those doing the banking, but also the banks themselves (Moscow & Felz, 2015). Additionally, state land-grant universities and other federally funded institutions are at risk of losing funding if they engage in any education or research activities related to cannabis production. Historically, farmers have relied on Extension research and education to improve their production methods and adopt best management practices.

Several states are coming out of an era of quasi-legalization and decriminalization. Ironically, this state of reduced punitive measures and legal risks associated with cannabis has paved a road for an increase in illegal cannabis grow operations, or what are called trespass grows (Vana, 2016). Without a regulatory framework encompassing cannabis cultivation, these trespass grows pose an unusually high risk for adversely affecting the environment and farming communities.

Because the federal government prohibits the production, distribution, and consumption of cannabis, states that have legalized any of these aspects must create and enforce their own laws and regulations. Federal law empowers states to legislate on

behalf of their citizens' health, safety, and welfare. Therefore, state and local policies must be implemented to both combat the increased risks and capitalize on the opportunities associated with a market boom. Tax regimes and environmental protection standards must be developed to compensate for the new wave of agri-business emerging in states where cannabis is grown.

The purpose of this study is to explore the ways in which cannabis production affects the food system of one region. While cannabis production and sale has effects that extend beyond the food system generally, this work focuses on how rural agricultural landscapes are affected by rapid growth in the cannabis industry. This exploratory work utilizes stakeholder focus groups to elicit the range of perceptions, opportunities, and concerns expressed by individuals involved in the changing landscape. Findings will be used to inform the selection of future research questions designed to inform states and counties seeking to develop and implement cannabis-related policies.

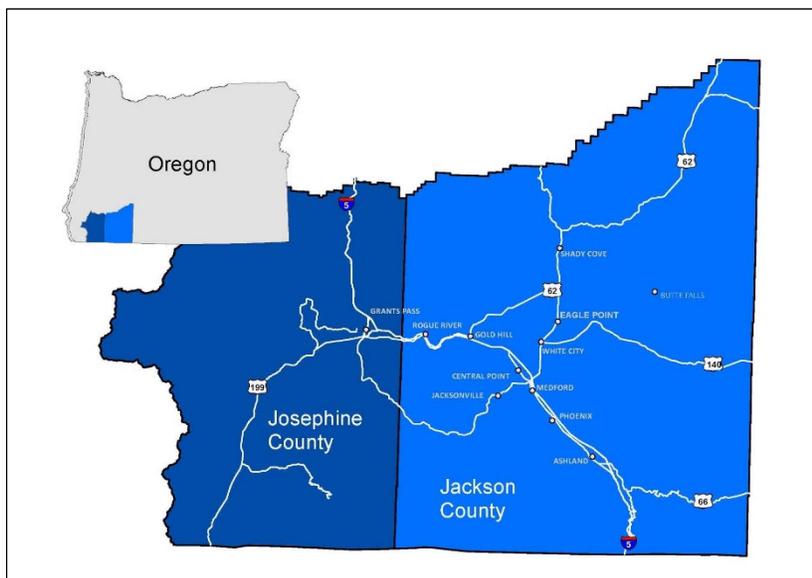
Cannabis Industry in Southern Oregon

Southern Oregon's Rogue Valley (see Figure 1) has a long history of commercial agriculture, beginning in 1885 with the first commercial apple orchards established in the Medford area. During the late

1800s and early 1900s, apples represented the largest agricultural commodity, peaking with about 400 growers and 10,000 acres (4,047 hectares) in 1910 (Oregon State University [OSU] Extension Service, 2007). By 1930, however, pears supplanted apples, primarily due to a regional climate and soil types better suited to pear production. During the 20th century, the Rogue Valley was also home to thriving dairy, alfalfa, hops, and small grain production. The region was identified as an excellent grape-growing region in the late 20th century, with a climate similar to the Bordeaux region of France (OSU Extension Service, 2007). During the 21st century, dominant agricultural crops have been pears, grapes, cattle operations, and dairy (U.S. Department of Agriculture [USDA], 2012). As the first state to decriminalize cannabis possession in 1973, Oregon gained a reputation as being more tolerant of marijuana use. Due to its climate and geographic isolation, southern Oregon, in particular, became a stronghold of illegal marijuana production in the 1980s (Johnson, 2017). By 2006, one estimate suggested that Oregon was the fourth largest indoor cannabis-producing state and the tenth largest cannabis-producing state overall (Gettman, 2006).

While southern Oregon's Rogue Valley has been a destination site for indoor and outdoor growing for decades (Gettman, 2006), Measure 91 dramatically increased the amount of cannabis cultivation. Today there are 314 licensed recreational growers in Jackson and Josephine Counties alone (Oregon Liquor Control Commission, 2018). Medical marijuana production is harder to track. In May 2018, the Oregon Health Authority released a report assessing the state's medical marijuana program. The report cites major challenges the state is facing in regulation and enforcement, including an inability to validate grow site locations, a lack of inspections and enforcement of grow sites, and insufficient and inaccurate

Figure 1. Southern Oregon's Rogue Valley (Jackson and Josephine Counties)



reporting and tracking methods. As such, determining the scope of medical marijuana currently being grown and processed in southern Oregon is difficult (Cabauatan-Vasquez & Yan, 2018).

The Rogue Valley had an estimated population of 303,831 people in 2017, 92% of whom reported their race as white alone (U.S. Census Bureau, 2017). Jackson County reported a median household income of US\$51,409 and Josephine County reported a median household income of US\$44,426 in 2017 (U.S. Census Bureau, 2017). The Rogue Valley is located within what has been referred to as “The State of Jefferson,” a largely rural area of southern Oregon and northern California historically and culturally rooted in forestry, mining, and agriculture (Lalane, 2017). The region has a history of secession movements rooted in a cultural and political identity distinguishing the region from urban areas to the north and the south (Lalane, 2017).

Research Methods

In December 2016, the Rogue Valley Food System Network (RVFSN) sought an academic partnership for the purpose of developing an exploratory study to address how cannabis production affects the regional food system. The network planned a series of stakeholder meetings and sought assistance on ways to use the findings as a form of needs assessment for future research. While some research needs, such as research on water requirements in cannabis, were already known, little was known about how the growth of the cannabis industry was affecting the regional food system overall. RVFSN hoped to facilitate stakeholder meetings for the purpose of both setting a civil tone for

community discourse, and identifying variables of interest for further study.

The RVFSN was formed in 2014 by a group of organizations, agencies, and businesses working to create a secure, sustainable food system accessible to all (RVFSN, 2018). In 2016, the organization voted to form a working group focused on the impact of cannabis production on the food system. The group was composed of individual representatives from RVFSN as well as community stakeholders with an interest in the relationship between the expanding cannabis industry and the food system. Formation of the working group stemmed largely from constituents’ interests in better understanding the growing conflicts between food producers and cannabis producers. Initial work focused on exploring the perceived opportunities and challenges associated with the changing landscape. The authors of this paper were members of that working group but did not have control over all decisions made during the planning process. Researchers were invited to disseminate the information generated during this community process to a broader audience. The stakeholder perceptions recorded in these meetings are described here as an exploratory study to inform future work investigating the impacts of cannabis on the food system.

The RVFSN held eight meetings designed to foster a community conversation about the changing agricultural landscape (see Table 1). Participants

Table 1. Description and Timing of Cannabis Community Meetings

Date	Meeting Type	Participants
April 5, 2017	Initial Stakeholder Meeting. Purposive sample of stakeholders across study area.	18
July 19, 2017	Public Interest Meeting with panel. Discussions not coded for analysis. Used to advertise community meetings.	150
August 31, 2017	Facilitator Training Meeting. Purposive sample of diverse stakeholders across study area.	15
September 7, 2017	Grants Pass Community Meeting	11
September 11, 2017	Talent Community Meeting	8
September 13, 2017	Little Applegate Community Meeting	10
September 18, 2017	Rogue River Community Meeting	18
September 20, 2017	Applegate Community Meeting	15

for the initial stakeholder meeting and the facilitator training meeting were selected through purposive sampling (Adler & Clark, 2011). The public interest meeting and all five community meetings were advertised by community facilitators and the RVFSN in local newspapers, discussion boards, social media, and local businesses. Facilitators took notes on wall-mounted notepads in all meetings. Additionally, a student research assistant took electronic field notes during all discussions (Kleiber, 2004). Digital notes taken during the meeting and facilitator-generated notes were compared to improve note accuracy during coding. No digital or voice recordings were taken during the community conversations because of concerns expressed by cannabis growers (Kleiber, 2004).

The first focus group took place in April 2017. Participants were selected using a purposive sample technique based on contacts from participating RVFSN representatives (Adler & Clark, 2011). A total of 18 recreational cannabis growers, medical cannabis growers, food producers, farmers growing both cannabis and food crops, ranchers, land use planners, and water resource managers participated in the meeting. Participants were divided into several discussion groups with representation across perspectives and were then prompted by research facilitators to address three primary objectives:

1. Identify potential opportunities or collaborations between the cannabis industry and food system.
2. Identify threats and challenges associated with the growing cannabis industry with specific emphasis on challenges to the existing food system.
3. Identify strategies for engaging in constructive and civil discourse with community members on how to leverage opportunities and address challenges.

During the initial stakeholder meeting, participants suggested small community-based focus groups to further explore the posed questions with a wider range of stakeholders. The working group identified community-based facilitators based on feedback from the original stakeholder meeting.

Three co-facilitators whose interests balanced each other were selected to facilitate meetings in each of the five communities in southern Oregon. Co-facilitators worked together to select an appropriate community venue and market the focus group to community members. Co-facilitators were carefully selected from each of the representative communities, each holding a different perspective on the impact of the cannabis industry on the food system.

Three months after the initial stakeholder meeting, a regionwide informational session exploring the opportunities and challenges associated with the growing cannabis industry on the food system was held in Medford, Oregon. The event was widely publicized by news outlets and trended across social media. Panel participants included a recreational cannabis grower, a water resource manager, a land use law consultant, a viticulture and agricultural labor specialist, and two academic facilitators. Panelists spoke for 10 to 12 minutes each and were then asked to collectively answer questions curated from the 150-person audience by the facilitators.

During the concluding 15 minutes of the regionwide forum, the community-based co-facilitators were introduced to the audience broadly. All those wishing to participate in further discussion were then asked to meet with the co-facilitators from their home community. Contact information was collected from interested parties.

All co-facilitators were asked to participate in a facilitation training session led by Southern Oregon University and Oregon State University Extension. Facilitators were trained on strategies for leading constructive conversations in tense environments, remaining objective during discussions to encourage full participation of attendees without bias, and ways to brainstorm ideas without judgment from participants.

Finally, co-facilitators held community-based focus groups in each of their respective towns. Focus groups explored the same three questions posed in the initial focus group. Several groups additionally chose to focus on strategies for further discussion. In total, 51 community members participated in the community-based focus groups.

An undergraduate research assistant attended

all meetings throughout 2017 as an objective note taker. In addition, notes generated by the facilitators during the community conversation were collected for analysis. Neither audio nor video recordings were made of the community stakeholder meetings because of concerns regarding the frequent disclosure of illegal growing and marketing (Kleiber, 2004). (In pilot interviews, cannabis growers had expressed concern regarding recordings of any kind.) All notes from the original stakeholder meeting and five community-based discussions were then digitized and coded by hand for common themes by two independent researchers (Kleiber, 2004). Each unique discussion topic during a meeting was treated as an independent occurrence of a theme or concept. Researchers met after coding was complete to explore intercoder reliability (Adler & Clark, 2011). Minor inconsistencies with coded themes were resolved by collapsing theme concepts.

Results

Ten themes were identified from the field notes taken during group meetings. Although some differences in discussion topics did exist between geographic locations, no systematic analysis of responses between geographic locations was attempted due to the small sample sizes and lack of repeated meetings in each community. A total of 531 unique conversations were coded, and the relative frequency of each theme was additionally explored (see Table 2). Although the researchers' focus was placed specifically on the impact of the cannabis industry on the food system, discussions repeatedly addressed opportunities and challenges of the growing cannabis production industry that extended beyond its impact on the food system. All findings have been included here, although some findings only marginally address the impact on the food system.

Environmental Concerns

Both food producers and long-time cannabis producers identified

an overall lack of agroecological understanding as a challenge. They argued that many of the newer cannabis producers do not understand soil health, the need for reduction in chemical usage, and the value of polycropping. Discussions of soil health often overlapped with land use concerns regarding soil compaction caused by heavy equipment, gravel, and/or high tunnels on exclusive farm use (EFU) lands. Overuse of chemicals, chemical runoff, and the possibility of raptor mortality as a result of rodenticide use were all mentioned as challenges. Cannabis producers further discussed regulations that prohibit composting in cannabis production as well as perceived constraints for intercropping food crops within cannabis production. Cannabis producers and food producers discussed work happening locally to develop "best practices guides" for new producers.

Environmental resource managers frequently discussed chemical runoff. One specific issue described in multiple meetings involved the accumulation of rodenticides in raptors. Some stakeholders attributed regional raptor mortality to an increase in cannabis production. These concerns are now being explored in more detail in terms of how cannabis production affects wildlife habitat (Franklin et al., 2018).

Regulatory Framework

Participants expressed concern and confusion regarding the regulatory framework for cannabis production and distribution. Recreational and

Table 2. Rank Order and Frequency of Coded Themes

Rank Order	Discussion	Frequency	Relative Frequency
1	Environmental Concerns	83	15.6%
2	Regulatory Framework	81	15.3%
3	Land Use Policy	81	15.3%
4	Resource Competition	59	11.1%
5	Financial Capital	58	10.9%
6	Cultural Change	56	10.5%
7	Educational Needs	41	7.7%
8	Leadership Development	28	5.3%
9	Stigmatization	24	4.5%
10	Corporatization	20	3.8%
	Total Discussions	531	

medical cannabis growers were most likely to express these concerns, but concerns were shared by neighboring food producers and urban dwellers as well. Specific confusion was noted between federal versus state policy as well as medical versus recreational policy. Cannabis producers expressed a lack of understanding of the laws that regulate their industry as well as concern over who is involved in making those decisions. Government overreach was discussed in several situations, often within minutes of a discussion of the need for stronger regulations. Although not all growers disclosed whether they grow cannabis legally or illegally, some evidence existed that legal producers were more likely to express a desire for stronger regulation. Finally, many discussions revolved around the persistence of black-market cannabis production throughout the region. Licensed growers expressed frustration over competition for resources and land with illegal producers. Frustration over licensed growers supplementing their income with illegal out-of-state sales was also mentioned regularly. Cannabis producers and food producers remarked on their estimates of how much of the cannabis grown in their region is illegally produced or sold, with some estimating that as much as 95% of all cannabis is sold illegally from both licensed and unlicensed grow sites.

Land Use Policy

Land use planning and zoning regulations differ among counties and are often poorly understood. Cannabis growers expressed concern that state and county officials can disagree over specific land use laws. For example, one focus group recorded a discussion between a local county employee and a state employee who disagreed over whether cannabis could be produced on rural residential zoned properties. Food producers in particular expressed concern over county regulations that restrict cannabis production to EFU zoned properties. EFU zoned lands are selected for zoning restriction based on having prime agricultural soils; however, cannabis production practices often involve laying gravel or sand over these soils for production in large high tunnels using imported soils. Thus, many food producers remarked that they were concerned that cannabis growers were adversely affecting

prime soils that might not be recoverable if cannabis production declines in the future. Some food producers argued that cannabis should be produced in commercially zoned properties. In addition, concern was expressed over the aesthetics associated with the required fencing, traffic, noise, and odors.

Resource Competition

Not surprisingly, a significant portion of the conversation between cannabis growers and food producers revolved around a perceived sense of resource competition for land, water, equipment, services, and labor. Food producers expressed concern over competition for water resources. Similarly, legal cannabis producers expressed concern over the same with illegal growers. While the region relies on water rights to allocate water as a resource, surface and groundwater are illegally accessed, and enforcement is strictly complaint-driven in the rural landscape.

Food producers reported being unable to source labor, services, and equipment as cannabis producers vie for the same local supplies and services. As noted above, some opportunity was expressed in this area to see the costs of materials come down through increased regional buying power, but immediate concerns revolved around shortages and longer waiting periods for goods and services. Food producers report losing labor to the cannabis industry. Recreational and medical growers reported internal competition, and both expressed frustration with the illegal market for competition. Regional housing shortages were also discussed as a part of this conversation, though most seemed to recognize that the housing shortage stems from a range of factors beyond the rise in the cannabis industry. As was noted in the theme of land use, an overall competition for available land has caused a perceived significant increase in land costs.

Financial Capital

One of the opportunities regularly discussed revolved around the idea of increasing financial capital in the region. Participants discussed the overall potential benefits of increased spending by cannabis producers. Specific to the food system,

benefits discussed included increased buying power for shared equipment, irrigation infrastructure, and overall rural development. Tax revenue was also discussed, but it was contested by participants. Two tax revenue challenges were identified regularly. First, current tax revenue is allocated within the county of purchase rather than production. As such, rural production counties like those in southern Oregon do not realize much of the total tax revenue. Second, as was mentioned already, cannabis producers perceive that most of the production at this point is still illegal and untaxed. The complex dynamic between legal and illegal production described here is consistent with research immediately to the south in northern California (Polson, 2013).

Cultural Changes

Concerns related to rural development included near-universal unease with outsiders moving into the region. This concern was expressed in a variety of ways, including consternation that the locals are being pushed off their land. Concerns were also expressed regarding an influx of people of color. Specific mention was made of migrant Latino and Hmong workers and/or owners.

In addition, participants expressed anxieties about crime, labor relations, and overall changes to community structure. Some participants discussed their anxieties around increased crime as connected to racially driven concerns centered around migrant labor. Increased crime was also discussed independent of race as being driven by a largely cash-based economy, increased use of firearms, and the reported connections between sex slavery and migrant farmworkers. This concern was raised by participants, including cannabis producers who reported suspicion of sex slavery by neighbors.

Additional concerns included the gentrification of rural landscapes and an overall fear of how a boom-and-bust economy might lead to long-term community infrastructure struggles. In many cases, the problems listed above were also listed as potential opportunities. Some participants spoke about the opportunities for seeing an increase in racial and ethnic diversity in the region as well as a resurgence of young farmers who have come to the region to grow cannabis.

Educational Needs

Cannabis producers specifically, but other participants as well, noted the need for educational materials on a wide range of issues. Specifically, they spoke about the lack of support they are receiving from Oregon State University Extension Services and local research institutions. They spoke of the need for training programs for cannabis farmers, regulatory training, medical research on the health benefits of cannabis, and educational conferences for networking and information-sharing. One opportunity expressed in this area included long-time food producers being able to market themselves as farming consultants in the cannabis industry as a source of supplemental income.

Leadership Development

Extension-based services, beginner farmer and rancher programming, grant-writing assistance programs, and lobbying have largely been led by institutional leaders in food production. However, cannabis growers expressed concern that no such leadership has emerged in their field. They regularly asked questions about who will advocate for their concerns, provide training, and coordinate efforts to support industry interests. Other participants felt that there was no organized effort to communicate the challenges being addressed to state-level decision makers. The historical “State of Jefferson” concept was discussed on numerous occasions as rural residents of southern Oregon expressed concern that their region was serving the demands of urban regions to the north and south without support or appropriate compensation.

Stigmatization

Stigma and perception of cannabis production were widely discussed as challenges in the industry. Cannabis producers spoke about their concerns of federal legislation that stigmatizes state legalization. They further spoke about the challenges this places on banking, as many banks continue to navigate federal law prohibiting dealings with cannabis growers. The resulting cash economy is further stigmatized, as legal businesses find themselves paying for services or supplies with large sums of cash. Other participants, including food producers,

described the difficulty of working with cannabis growers due to stigmatization. They described being concerned about how community members might feel about them if they are seen collaborating with or sharing resources with cannabis producers. Focus group participants did not discuss the moral arguments surrounding the legalization of cannabis. This lack of perspective may have been the result of self-selection.

Corporatization

Although discussions largely revolved around a contestation over resources, values, and community structure, participants also discussed concern over the influence of outside corporate interests. Food producers and long-time cannabis producers fear the region will be opened up to large agribusiness interests and outside investments. Many of the participating cannabis producers identify themselves as “locals” with long histories of production (either food or cannabis) in southern Oregon. Several told stories of neighbors whom they perceived were working for large corporations. Whether real or perceived, there was a sense that local economies were being replaced by corporate investments that would not benefit the local region. They also expressed concern over a shift in values away from land and community stewardship to businesses rooted in financial gains. Resource competition seemed to drive this conversation, as “local” was subjectively defined in most cases as those who currently live in the Rogue Valley. Several of the most outspoken cannabis producers in this argument had moved to Oregon within the past couple of years but were actively promoting restrictions on any new licenses.

Discussion

The stakeholder perceptions explored here collectively contribute a valuable lens into how cannabis legalization unfolds on a rural landscape. Stakeholders expressed a range of fears, anxieties, and excitement about how the cannabis industry might continue to develop in southern Oregon. As states continue to contemplate or implement legalization of cannabis production, a constructivist approach to understanding social and environmental

problems can be useful in research and policy development.

A constructivist research lens, alone, however, was not the intent of the RVFSN cannabis working group. Perceptions were intended to drive research to address opportunities and concerns. Multidisciplinary research in cannabis production is needed and includes agricultural and environmental scientists to look at best practices in production; hydrologists to look at water use, flow, and availability; sociologists to explore labor and rights issues; land use planners to explore appropriate zoning; legal experts to address clarity in laws; and communication experts to address the confusion growers and neighbors feel regarding law.

Researchers interacted individually and in groups with cannabis growers, neighboring food producers, land use planners working with cannabis growers, water resource specialists, cannabis policymakers, and concerned citizens. The perceived risks and opportunities reported here were constructed through careful listening and observation. However, the limitations of this research include its exclusive focus on stakeholders' perceptions. Participating researchers did not attempt to correct conversations involving concerns or opportunities that diverged from existing research findings. The questions drawn out of focus groups require further research to support or refute stakeholders' claims. Furthermore, our research was confined to exploring how cannabis production is affecting the food system in the Rogue Valley alone. The extent to which these findings can be generalized to other growing regions remains unclear. Finally, the cannabis industry in southern Oregon is reportedly changing as a result of legalization in California. Increased competition and increasing supply have resulted in price decreases that may affect concerns and opportunities. It is presently illegal at both the state and federal level for cannabis products to move across state lines. However, as noted above, stakeholders currently report that because so much of the market is actually in states where it is still illegal to grow, this may have little impact on overall sales. Federal legalization of cannabis would likely increase market potential through legal market access.

Conclusions

While cannabis remains illegal at the federal level, states are increasingly decriminalizing and promoting cannabis production and in-state sales. The focus group analysis conducted here may be helpful in the development of research, land use policy, regulation, and enforcement strategy. Findings suggest that communication between policymakers and cultivation regions will be necessary to address the changing landscape for food producers and rural communities generally. Decriminalization after a history of prohibition has further led to widespread confusion and/or misinterpretation of state law. Improved communication between states and growers, states and counties, growers and counties, and between growers themselves may be necessary to avoid disputes.

Additional research addressing the perceived concerns presented by community members and stakeholders will be needed to verify the qualitative research presented here. Initial findings have been used and will continue to be used by researchers and practitioners interested in further exploring the relationship between cannabis and the food system. Results have informed local efforts to begin quantifying water use in cannabis production and in comparing water use to that of local wine grape

production. Other researchers are currently exploring the impact of cannabis production on wildlife.

While stakeholders in this study spoke about opportunities and concerns generally, researchers focused on questions regarding the impact of cannabis production on the regional food system. Many of the concerns voiced were beyond the scope of this research. Additional research will be needed to understand the broader effects of a changing cannabis economy. For example, concerns of a growing sex trade industry associated with the cannabis industry were not explored here in detail, nor were enforcement strategies for illegal growing operations or interstate trade.

In summary, there is a perception among stakeholders that the emergence of a cannabis economy in southern Oregon is affecting the regional food system. These impacts include a number of challenges related to land use, environmental degradation, and resource competition. However, effects also include opportunities for shared resource use, rural economic development, and educational collaboration. Additional research will be needed to explore the perceived impacts of cannabis production on the food system as discussed in stakeholder meetings.

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Establishing sustainable food production communities of practice: Nutrition gardening and pond fish farming in the Kolli Hills, India

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Abstract

This study describes the formation of nutrition gardening and pond fish farming communities of practice (CoPs) among small-scale farmers of the Malayalis tribe living in the Kolli Hills region of

Tamil Nadu, India. We examine the factors that have shaped the formation of these CoPs, their purpose and function, who is involved, what activities hold these communities together, and their role in strengthening sustainable food production and consumption practices. Data were obtained through participatory rural appraisals (PRAs), key stakeholder interviews, and participant observations during four months of fieldwork. The primary motivations that led the nutrition gardeners and pond fish farmers to become part of CoPs were to improve the health and nutrition of their families and to obtain expert advice in sustainable

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food production practices. Both CoPs are in the early stages of development and differ not only in the types of food they produce and the skills and tools needed for their success, but also in their structure; nutrition gardening takes place at the individual and/or household level, whereas pond fish farming operates at the group and/or community level. The ways in which members experience being in a community also differs. Nutrition gardeners rely on open-ended conversations and community creation through relationship building; in contrast, fish farmers find that group meetings and maintaining transparent record-keeping are most important. Sustainability of these practices and the CoPs depended on factors internal to the communities (e.g., leadership, knowledge mobilization) as well as external factors (e.g., rainfall and market potential).

Keywords

Sustainable Food Production, Communities of Practice, Nutrition Gardening, Fish Farming, Participatory Rural Appraisal, Kolli Hills, India

Introduction

There is growing evidence that continued emphasis on agricultural industrialization, concentration of capital and resources, and globalized trade of a limited number of agricultural commodities is generating socio-economic disparities and ecological impacts that threaten global food security (Clapp, 2017; Foley et al., 2011; Garnett et al., 2013; Godfray, 2010; Thrupp, 2000). In India, where the negative impacts associated with these agricultural trends are compounded by climate change stressors (such as severe drought and intense flooding), food insecurity is especially high among poor and marginalized small-scale farmers (Shiva, 2016a; Singh, 2000). In 2009, a six-year interdisciplinary research program entitled “Alleviating Poverty and Malnutrition in Agrobiodiversity Hotspots” (APM) was initiated in three regions of rural India to improve food security among small-scale farmers through improved access to information and knowledge exchange about sustainable food production. This research was developed through collaboration between the University of Alberta’s Faculty of Agriculture, Life and Environmental Sciences and

the M.S. Swaminathan Research Foundation (MSSRF), which is based in Chennai, India (Raghu et al., 2013).

As part of the APM program, we examined CoPs that formed around two food production practices—nutrition gardening and pond fish farming—established through the APM project among small-scale farmers of the Malayalis tribe in the Kolli Hills region of Tamil Nadu. The introduction of each of these practices offered the opportunity for farmers to address nutrition deficiencies, save money by making fewer market purchases, and make money by selling excess produce. These practices were selected because they build upon traditional practices of forest gardening and river fishing and are low-technology interventions that could be continued by local villagers once the program ended. Consistent with MSSRF’s mandate, a participatory, community-based approach was used in the introduction and development of these practices.

In this study, we investigate how the Malayali farmers learn from others and adopt new agricultural practices that can improve their food security. Although there are obvious environmental, political, and social constraints in raising awareness about and adoption of sustainable farming practices, we suggest that it may also include the current systems of knowledge mobilization among research centers, agricultural extension, and the farmers themselves. Improved knowledge-sharing among these parties may improve farmers’ ability to assume more control over what they produce, reduce environmental externalities and the cost of production, enhance environmental quality through the promotion of practices that capture the regenerative processes of growing food, and increase access to nutritious food for families and communities. Greater understanding about CoPs that form to advance sustainable agriculture and improved nutrition can inform other efforts to work with small farmers as a community of farmers who routinely learn from each other and often from outsiders as well.

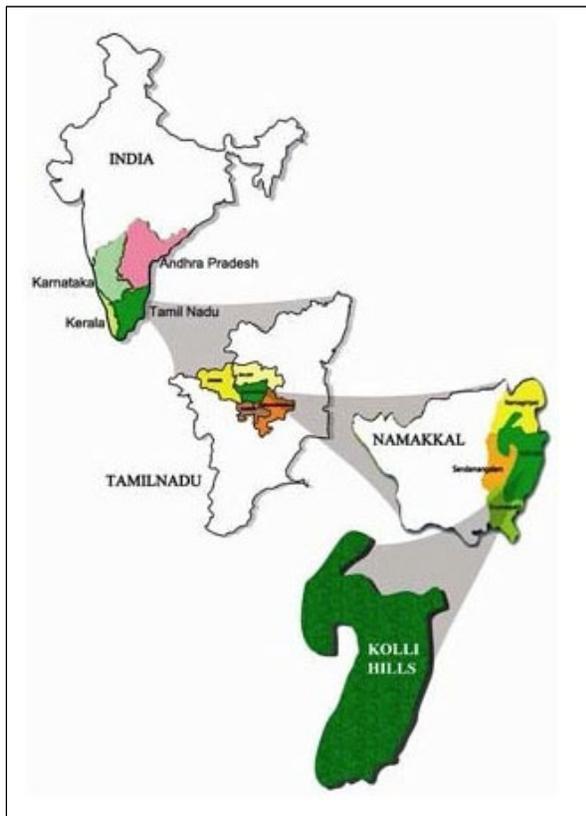
We begin with a brief description of the study site, followed by an overview of the literature pertaining to sustainable agriculture and communities of practice to provide a theoretical framing of this

study. This is followed by a description of the data collection methods. We then discuss the findings in relation to the development and maintenance of nutrition gardening and pond fish farming communities of practice. The conclusion provides summative remarks about the role of these communities of practice in fostering individual and collective learning about sustainable food production.

Context

The Kolli Hills are in the Western Ghats mountain range in the Namakkal District of the southwestern

Figure 1. Map Showing the Location of the Kolli Hills



Source: Sekar, Murugan, Pandikumar, Al-Sohaibani, & Ignacimuthu, 2016, p. 110.

Indian province of Tamil Nadu (Figure 1). The study area lies between 11° 10' 54" and 1° 30' 00" N latitude and 78° 15' 00" and 78° 30' 00" E longitude. This hilly region ranges from 180 m (591') in the foothills, up to 1415 m (4,642 ft) at the plateau. Rainfall in this area is approximately 1300 mm (51") per year, most of which falls in the rainy months between May and December (Francis Xavier, Freeda Rose, & Dhivyaa, 2011).

Agriculture is the mainstay of the Kolli Hills, where 51% of the total area is under agriculture and the remainder is a protected reserve forest (Kumar-Range, 2001), but soil fertility and agricultural production output are relatively low (Raghu et al., 2013). Traditionally, there was a variety of locally produced foods such as rice, minor millet, bananas, jackfruit, tamarind, citrus, coffee, spices, and medicinal and aromatic plants, some of which were gathered through practices of forest gardening, as well as fish from river fishing (Raghu et al., 2013). In recent decades, malnutrition has been high in the region, with little to no household consumption of fruits and vegetables, and low protein intake. The introduction of cash crops, predominantly cassava, increasingly has displaced the production of nutritious varieties of small millet that have been grown in the region for centuries (Raghu et al., 2013).

Most of the 42,200 inhabitants of the Kolli Hill region are Tamil-speaking and belong to the Malayali population, one of India's Scheduled Tribes¹ whose members own small and marginal farm holdings or work as farm laborers (Kumar-Range, 2001; Raghu et al., 2013). The Malayalis are discriminated against as being considered a primitive culture, have limited political voice, and due to their relative isolation have poor access to markets, products, and services (Finnis, 2006). Aside from footpaths that connect the Kolli Hills to the surrounding plains, there is only one road suitable for vehicles (Kumar-Range, 2001).

¹ The Scheduled Tribes (ST) of India live in relative isolation in forested hilly/mountainous or desert regions. Members of a tribe are united by a common dialect, traditions, beliefs, and customs. Their livelihood is tied to their specific environment but generally centers on subsistence agriculture, hunting, and gathering. ST are among the most socio-economically disadvantaged groups in India, with high levels of poverty, illiteracy, and low access to resources. In recent decades the central and state governments have enacted legislation and provided funding for education and employment programs to improve their socio-economic status (Dragomir 2017; Naseer 2015; United Nations, n.d.).

Literature Review

From Food Security to Food Sovereignty

The Green Revolution transformed agriculture in India by replacing traditional farming practices and regional food diversity with an increasing reliance on external inputs and monocultures of cash crops (Patel, 2013; Shiva, 2016b). India's enrollment in the global agri-food system has resulted in greater state support for export-oriented crops, the over-use of chemical fertilizers and irrigation to increase productivity, increasing debt among farmers, and higher domestic food prices, none of which has contributed to national food security or put more cash in the hands of the poor (Carolan, 2012; Hazell, 2009; Sen, 1974; Shiva, 2016b). Among the small-scale farmers of the Kolli Hills region of Tamil Nadu, where subsistence farming of traditional varieties of small millets with high protein and mineral content has been replaced by large-scale production of less nutritious cassava, there is a high prevalence of iron, protein, and calcium deficiencies (Finnis, 2009).

In response to the legacy of agricultural modernization efforts, development agencies and nongovernmental organizations like MSSRF have shifted from a linear and top-down transfer of technology (ToT) model toward extension models that place farmers and their needs first (Chambers & Ghildyal, 1985; Cullen, Tucker, Snyder, Lema & Duncan, 2014; Scoones & Thompson, 1994; 2009). The concept of food sovereignty—the right of farmers to maintain and develop their capacity to produce basic food crops and maintain cultural diversity—has reinforced the emphasis on farmers' traditional knowledge and its mobilization through farmer-to-farmer networks (Altieri, 2009; Claeys & Lambek, 2014; Desmarais, 2012; Wald & Hill, 2016). Traditional knowledge related to seed saving, food preservation, and the use of ecologically based fertilizers and pesticides has been shown to be key to the success of diversified, small-scale farms (Altieri, 2009; Sinha, 1997; Thrupp, 1989), which are estimated to produce over 80% of the food consumed in a large part of the developing world (International Fund for Agricultural Development [IFAD], 2013). While the role of smallholders in addressing food security and poverty in

local contexts is acknowledged by the International Fund for Agricultural Development as important (IFAD, 2013), a debate has emerged about how best to address global food security given the world's growing population, which is expected to reach more than 9.6 billion by 2050. Some contend that increasing productivity through agricultural intensification is essential to securing global food security (Garnett et al., 2013; Tilman, Balzar, Hill & Befort, 2011). Food security, however, is not only about increasing food volume; it is equally about nutrition (Freedman, 2015), food access, and improved food sovereignty. Our study examines CoPs formed around two small-scale farming practices in the Kolli Hills region (nutrition gardening and pond fish farming), which were introduced to increase farmers' capacity to grow more nutritious and diverse food for local consumption, as opposed to the monocultures of cash crops grown for global markets. These CoPs revolve around social learning for sustainable food production and healthier food consumption as farmers create and exchange knowledge within their communities.

Nutrition Gardening

Nutrition gardening, often in the form of home or community gardening, has played an essential role in improving food self-sufficiency, particularly in countries of the Global South during times of crisis (Galhena, Freed & Maredia, 2013; Marsh, 1998). Examples include the development of urban agriculture in Cuba during the "Special Period" that was triggered by the collapse of the Soviet Union, their major trading partner (Buchmann, 2009; Premat, 2009), and the proliferation of home gardens in Sri Lanka as a post-tsunami and post-war strategy for agri-food resilience (Galhena et al., 2013). This form of small-scale food production has been proven to meet nutritional needs without negatively affecting the resource base and, in fact, often improves it (Torquebiau, 1992). The benefits for small-scale farmers are widespread and include improved food and nutrition security, monetary gain (either through reduced expenditures or profits from marketing), improved human capacity, the empowerment of women, and the preservation of indigenous knowledge and culture (Mitchell &

Hanstad, 2004). Although similarities exist among home gardens in different settings, they are unique in structure, functionality, composition, and appearance (based on the environment within which they are situated), as well as family members' preferences, skills, and access to resources (Galhena et al., 2013). Despite many examples of the benefits and success of home gardening, the literature also provides examples of failures resulting from environmental, cultural, and/or economic factors (e.g., Corzo Márquez & Schwartz, 2008).

Pond Fish Farming

According to the Food and Agriculture Organization of the United Nations (FAO), large-scale aquaculture is recognized as the fastest-growing food industry in the world, but small-scale aquaculture also has an important role to play for sustainable food production and food security (Kawarazuka & Béné, 2010; Townsey, 2013). Fish are rich in essential nutrients, such as vitamin A, calcium, iron, and zinc, and fish consumption can significantly improve diet. In Mexico, a study by Mitchell (2015) showed that participation in the production and sale of fish not only improved farm family diets, but also elevated women's economic status and significantly reduced household food expenditures. In Asia, where aquaculture has shown steady growth in recent decades, there is also clear evidence of associated household income and nutritional benefits (Ahmed & Lorica, 2002; Yamamoto, 2013). However, Ahmed and Lorica (2002) conclude that in order for aquaculture to more effectively address food security and poverty among small-scale and subsistence-level farmers in Asia, there is a need for better institutional and infrastructure support. In Eastern Africa, Mwanja and Nyandat (2013) also identified poor infrastructure and poor knowledge mobilization as factors influencing the failure of local fish farming initiatives, as well as the quality of fish fingerlings, the lack of fish food, lack of traditional experience, gender inequality in control of resources, and land tenure insecurity.

Communities of Practice

CoPs reflect the fundamentally social nature of human learning. They are those "groups of people

who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger-Trayner & Wenger-Trayner, 2015, p. 1). Wenger-Trayner and Wenger-Trayner (2015) distinguish a CoP from other groups and communities by three elements. First, there is a shared *domain* of interest and a commitment to that domain, where members share information and learn from each other. Second, the *community* is created in the pursuance of their common interest through joint activities and discussions. Third, the *practice* itself takes time and sustained interaction, whereby members develop shared resources, experiences, stories, tools, and ways of addressing problems. Interventions that can facilitate knowledge exchange and relationship-building can help these groups gain their full potential (Li, Grimshaw, Nielsen, Judd, Coyote, & Graham, 2009). The strength of a CoP lies in the continuous learning and active participation of its members. Participation in a CoP is not always equal, however, as power relations can emerge within and outside the community. One of the benefits of using the CoP approach to research is that one can observe different levels of participation, group dynamics, and knowledge exchange among multiple stakeholders to solve problems and innovate (Cullen et al., 2014).

Within a CoP analysis, Wenger, White, and Smith (2009) refer to *orientations* of CoPs as the typical patterns of activities and connections through which members experience being a community. Communities may rely on meetings, open-ended conversations, or may organize themselves around common projects. They may also focus on the creation and sharing of content, rely on expert advice, relationship building, community cultivation, or serving a common cause in a specific context. These orientations are described in Table 1 in further detail.

Methods

This study takes a qualitative research approach to examine how CoPs are formed and maintained around sustainable food production. Qualitative data were obtained in the field with CoP members through participatory rural appraisal (PRA) (Table 2), semistructured interviews (Table 3), and

Table 1. Orientations of Communities of Practice

Orientation	Description
Meetings	Members engage in shared activities for a specific time. Regular face-to-face, well-attended meetings, with enthusiasm to participate, connection to others, and useful outcomes to ensure the communities' existence.
Open-ended Conversations	Members rarely meet formally, but instead maintain ongoing conversations as their primary way of learning.
Projects	Organized around a particular project; members participate in activities together.
Content	Interest in creating, sharing, and providing access to documents, tools, and other content. Valuable and well-organized content is useful for members to attract new members and makes it possible to offer a community's expertise to others.
Access to Expertise	Reliance on expertise (internal or external) to answer questions, fulfill requests for advice, or to engage in collaborative, just-in-time problem-solving.
Relationships	Emphasis on the interpersonal aspect of learning together. Involves networking, trust-building, and mutual discovery.
Individual Participation	Individuals experience learning through participation, personalized exchange, and individual development.
Community Cultivation	Need to reflect on the effectiveness and health of the communities to make things better. Activities are well planned, reference materials are well produced and organized, and members find that someone is always responsive to their requests, contributions, and changing needs.
Serving a Context	Outward-facing mission as a key driver of community evolution.

Adapted from Wenger, White, & Smith, 2009, pp. 69–100.

participant observation. Participant observation included events such as a children's summer computer class, videoconferencing of health information, cooking demonstrations, training for coffee farmers, and a fish harvest demonstration, as well as a farmer research group meeting for paddy variety trials. Fieldwork consisted of the first author spending two and a half months (April to July 2013) and the third author spending two weeks (April 2013) in the Kolli Hills region. Participants in this research were recruited using purposive intermediary snowball sampling. MSSRF served as the intermediary in this process as it had good knowledge of existing relationships with most of the farmers in the project area.

The PRA method was used so that community members could be involved actively in the research process. The continuous critical (and self-) reflection that this method requires can empower local people to actively analyze their own living

conditions, problems, and potentials for change (FAO, 1999). PRA activities and the location and number of male and female participants are presented in Table 2. The PRA activities that were inspired by Wenger, White, and Smith's (2009) orientations (Table 2, # 11 and 12) were of particular value for this study. Both fish farmers and nutrition gardeners were asked to place a circle on a diagram showing the relevance of each orientation along a continuum, from least important to most important. This rating system allowed for open dialogue among practitioners as they decided what was most relevant for their particular CoP.

PRA gatherings and interviews took place early in the morning or in the evening, as to not interfere with farmers' daily work, in locations convenient for participants, such as a village meeting area (see Figures 2 and 3). There was no financial incentive offered for participation, although refreshments were served at each PRA meeting and small gifts

Table 2. Participatory Rural Appraisal (PRA) Activities

#	Name of PRA	No. of Participants		Location
		Men	Women	
1	Seasonal Cycle of Millet, Cassava, and Rice	3	1	Thurapallam
2	Timeline for Nutrition Garden Cycle	3	1	Thurapallam
3	Times for Fish Farming Cycle	1	0	Semmedu
4	Training Aspirations Spider Diagram #1	17	0	Oyankulipatty
5	Training Aspirations Spider Diagram #2	0	9	Oyankulipatty
6	Training Aspirations Spider Diagram #3	11	0	Odakatupatty
7	Training Aspiration Spider Diagram #4	0	12	Odakatupatty
8	Orientations PRA with Nutrition Gardeners	0	4	Oyankulipatty
9	Orientations PRA with Fish Farmers	4	2	Asakattupatty
10	Knowledge about Nutrition Gardening #1	0	14	Puduvalavu
11	Knowledge about Nutrition Gardening #2	1	13	Manjalpatty
12	Knowledge about Pond Fish Farming #1	4	1	Ththandipatty
13	Knowledge about Pond Fish Farming #2	4	3	Thurapallam
14	Conversation PRA with Nutrition Gardeners #1	3	6	Asakattupatty
15	Conversation PRA with Nutrition Gardeners #2	6	10	Odakatupatty
16	ICT PRA: Women Most Common VKC Users	0	7	Alavadipatty
17	ICT PRA: Men Most Common VKC Users	6	0	Asakattupatty
18	Technology Use Timeline	5	12	Oyankulipatty
19	Media Footprint Diagram	2	6	Oyankulipatty
20	Media Footprint Diagram	4	6	Oyankulipatty

were given to those we interviewed individually. We conducted individual interviews with 20 men

Figure 2. Participatory Rural Appraisal (PRA) to Characterize Knowledge About Nutrition Gardening



and women community leaders to further substantiate findings from the PRAs and gain a more in-depth understanding of food production activities that took place in the Kolli Hills, and of the inner workings and relationships that exist within CoPs. A translator was used for data collection and transcription.

Findings

In this research we examined CoPs that formed around nutrition gardeners and pond fish farmers in order to understand how each emerged, how the characteristics of members differed, what quali-

ties leaders within each community had, and what factors allowed the CoP to maintain itself. We were mindful of the development of the *shared domain*, *community*, and *practice* of each, which are the essen-

Figure 3. Participatory Rural Appraisal (PRA) with Fish Farmers in Thathandipatti



tial components of a CoP, as well as the various orientations—patterns of activities and connections—utilized by each CoP (Wenger-Trayner & Wenger-Trayner, 2015). The following section summarizes the findings for each of the CoPs.

Nutrition Gardening

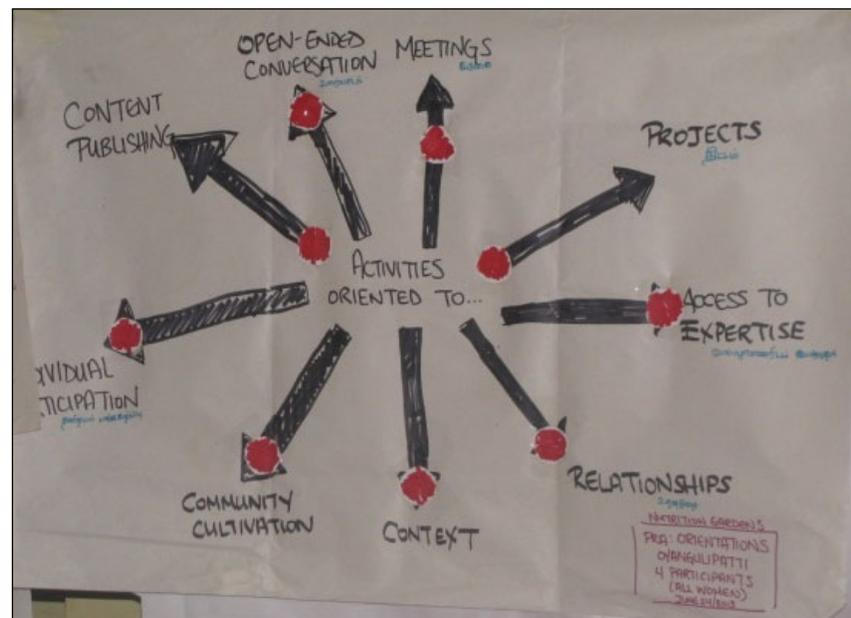
Nutrition gardeners placed equal importance on six orientations they identified as most relevant to this practice: individual participation; access to expertise; open-ended conversation; community relationships; community cultivation; and serving a context (Figure 4). Group meetings were considered to be more important in the initial stages of formation, whereas creating and sharing written content on how to do the practice and being part of group projects were not seen to be central to this community. In the following paragraphs, we examine these orientations and how they related to both CoPs.

Nutrition gardening is a household-level practice whereby individuals and families (mostly women) take on a maximum of 15 minutes of daily responsibilities, such as seeding, weeding, watering, and harvesting. Individual participation was therefore noted as essential. Although MSSRF provided initial training and inputs for gardening, each household ultimately took responsibility for its own garden, from land preparation, to seed selection, to harvest, and to preparing food. As reported by farmers, men took part in some of the more strenuous activities, particularly in preparing the plot for planting between harvests (which required a few hours of work, up to four times per year), whereas women (mostly between the ages of 20 and 60) and children participated in

daily gardening activities, and women cooked the food. Households with the lowest income were likely to be most interested in nutrition gardening, as it reduced the amount of money spent in the market on fresh produce.

Access to expertise was important to nutrition gardeners, even though uncontained gardening has existed for generations in the Kolli Hills. MSSRF staff provided agronomic advice (i.e., plot placement, crop rotation within the garden, intercropping for purposes of integrated pest management, and vermicomposting) and demonstrated food preservation (drying, pickling) and cooking techniques. Village volunteers (both men and women) were also recruited to support the development of these CoPs and serve as liaisons between the community and the project staff. These volunteers had to have a minimum of 10th standard education, which generally compares to the completion of a high school diploma in North America; basic knowledge about computers (as they also ran the village knowledge centers²); and strong links to their communities. Initial training lasted one to two

Figure 4. Orientations Participatory Rural Appraisal (PRA) Diagram with Nutrition Gardeners in Oyangulipatti



² Village knowledge centers were set up by MSSRF as resource hubs for community members to access and share agricultural information, gain skills training (e.g., computer classes), and serve as venues for community meetings.

days, but there were ongoing learning opportunities throughout the year about nutrition, agricultural practices, and government schemes to provide financial aid to farmers. Villagers could contact village volunteers to access supplies for their gardens and gain advice on pest management and irrigation. Volunteers explained that they enjoyed the opportunities for learning, being of service to others, and the small monthly honorarium provided by APM.

Community members identified *meetings* as somewhat important for the initial introduction of gardening techniques and for the regular cooking demonstrations, which were attended by both men and women. After several regular face-to-face visits from community volunteers and MSSRF field staff members, formal public meetings became less necessary. Most participants commented that they only accessed MSSRF staff when they needed more seeds or other supplies.

Gardeners placed importance on learning from each other through *open-ended conversations*, which aided in the formation and maintenance of *community relationships*, both of which were key to exchanging information and learning from each other's experiences. Discussion about fertilizer use, pest control, and the lack of water (due to drought) were common conversation topics at the house-

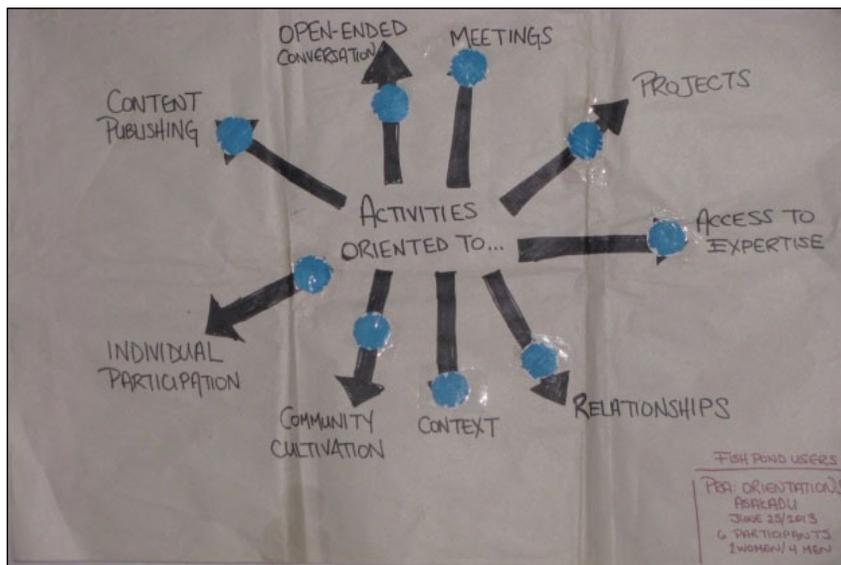
hold and community level. Nutrition gardeners, especially women, often shared recipes and excess produce with family and neighbors. These verbal and material exchanges took place most commonly in the workplace, in the market, in villages in the evenings, and at the numerous religious festivals that take place throughout the year. These exchanges bolster relationships of reciprocity and mutual trust (Miller, Van Esterik & Van Esterik, 2009). Similar to what Torquebiau (1992) found, nutrition gardeners emphasized the importance of *community cultivation*—working together to empower their communities to become more food secure. Community teamwork was evident as they prepared food together at festivals.

Community members agreed that participation in nutrition gardening was beneficial because it served a specific *common context*. Similar to other case studies on nutrition gardening, the most significant benefit identified was improvements to general family health and nutrition (Mitchell & Hanstad, 2004). The second most important benefit, also identified by Mitchell and Hanstad (2004), was the opportunity to save money due to reduced spending on food at the market. Families in the Kolli Hills with gardens saved an average of 200 rupees (approximately CA\$3.70 or US\$2.82) per week. Due to the small size of the gardens, production volume was relatively low; and hence, selling surplus produce in the marketplace was not a viable option during the time of the fieldwork.

Pond Fish Farming

Group fish farmers placed the greatest importance on access to expertise, serving a context, group meetings, and content publishing (Figure 5). Open-ended conversations, projects, relationship-building, and community cultivation were identified as being slightly less important, whereas individual participation was considered least important to the way that this CoP functioned.

Figure 5. Orientations Participatory Rural Appraisal (PRA) Diagram with Fish Farmers in Oyangulipatti



MSSRF initiated village-level meetings to inform farmers about pond fish farming and the potential benefits. MSSRF identified four usable community ponds (which were otherwise used for bathing, washing clothes, and as drinking water for cattle), eight individual fish ponds in the project area, and 50 group ponds outside the project area. Although river fishing existed historically among the Malayali people, pond fish farming as an enterprise and communal activity was a novel practice introduced by MSSRF. Therefore *access to expertise* was named as an essential community orientation, particularly since most of the groups had only experienced one harvest at the time of this research. The fish farmers used the expertise of the MSSRF fish scientist to establish and maintain the community fish ponds, obtain the necessary permits from the government, access inputs such as fishlings and nets for harvest, and learn about cleaning and cooking the fish.

The APM project initiated community pond fish farming primarily as a way to address nutritional deficiencies prevalent among farmers in the Kolli Hills, and also for potential income generation. The farmers believed that *servicing a context*—for the health and nutrition of their families—was one of the most important reasons to participate in the practice. They learned about the nutritional benefits of consuming fish to address the protein and iron deficiencies that are prevalent in the population and are linked to certain diseases. Participants also learned that fish farming has the potential to generate income through the selling of surplus product in the marketplace. As this was a new practice, fish production at the time of data collection only provided enough fish for the participating families' own consumption. People were eager to increase yields so that they could sell excess fish and were also interested in starting hatcheries in order to produce fishlings locally, as many had died during transport.

Involvement in pond fish farming was voluntary, but the APM project attempted to address gender equality by encouraging equal membership of men and women. Each group consisted of six men and six women and had a formal self-governing structure whereby monthly *group meetings* were held to collect the monthly fee, maintain

records, decide what investments needed to be made, and create schedules for fish feeding. Meetings were also open to outsiders who were able to listen or ask questions. Most decision-making happened in this formal meeting context, but *open-ended conversations* were identified as relatively important for ensuring that all members took care of their allocated responsibilities throughout the month, dealing with potential problems such as drought or pest control, and monitoring accountability of members' investments. All members contributed 100 rupees (approximately CA\$1.85 or US\$1.41 USD) per month, most of which was used to purchase ingredients for making the fish feed. Two group members worked approximately one hour each day to feed the fish, and the responsibilities ran in two-week cycles. The only reason for a member to leave the group was if they had to temporarily move for work away from the Kolli Hills.

Leadership roles (president, secretary, and treasurer) within the group were determined by consensus. Roles could change after every harvest to allow new members to learn different responsibilities. A common quality of the leaders was that they had relatively higher levels of education than the other members, and one group explained that they also ensured that an elder with experience took on one of the leadership roles. All leadership roles within the fish farming groups were occupied by men during the data collection period, although one group had nominated a woman to be its next president. When asked about personal motivations for taking on leadership roles, farmers explained that it created good learning opportunities with regard to banking, teamwork, and nurturing a personal interest in fish ponds, but improving the health of their families surpassed these. Consistent with the fish farming studies by Ahmed and Lorica (2002) and Yamamoto (2013), the nutritional contributions to diet garnered by fish farming was the strongest motivator for participation.

The importance of *community cultivation* (the well-being of the community as a whole) and *relationship building* (through teamwork needed for this type of joint venture) were also viewed as important. Care of the ponds was a new skill for most members, and they relied on each other to

maintain the ponds and share the responsibility of dealing with problems, which is why farmers rated the *projects* orientation (members participating in activities together) as relatively important. Cleaning the pond, preparing food for the fish, controlling pests, preventing thefts, harvesting, and preparing fish are all projects that were essential to the maintenance of this food production practice and were carried out by all members; however, women's roles were mostly limited to preparing fish and cooking the fish after harvest. The entire group agreed upon all labor divisions and other decisions. In this CoP, there was little focus on the individual, which is why *individual participation* was placed at the bottom of the spectrum, save for the individual group members who cleaned and cooked fish after the harvest.

Discussion and Conclusion

Having presented the data in relation to the CoP *orientations*, we now return to the three elements of CoPs in relation to the social practices of nutrition gardening and fish farming: a shared *domain* of interest, whereby members are competent in contributing to it as they share information and learn from each other; *community* is created as members engage in activities and discussion in order to pursue their interests; and *practice* develops from sustained interaction among the members as they develop shared resources, experiences, stories, tools, and ways of addressing problems (Wegner-Trayner & Wenger-Trayner, 2015).

The *domain* of interest for the members of each of the CoPs examined here is reflected in their common goals and commitment to achieving them through the practice in which they participate. Improving the health and nutrition of their families was identified by both nutrition gardeners and pond fish farmers as their primary goal for participating in these practices, but the financial benefits (e.g., decreased spending on food purchases and potential income generation) were also identified as important. These findings are consistent with other studies of home gardening and small-scale aquaculture that identify the contribution of these practices to food security and improved economic status for the participants (e.g., Galhena et al., 2013; Townsey, 2013).

The *community* of nutrition gardeners was created as members regularly attended cooking demonstrations, cooked together at local festivals, exchanged recipes, and shared excess produce. They also compared yields and shared information about establishing and maintaining a garden through fertilizing, crop rotation, and pest control. *Serving a context, individual participation, access to expertise, community cultivation, relationships, and open-ended conversations* were identified as the most important orientations by nutrition gardeners. In contrast, the orientations relevant to fish farmers as they build their community were *serving a context, group meetings, content publishing, and access to expertise*. The *community* of fish farmers was supported more formally, as members learned how to collectively take part in pond fish farming, invest money equally, maintain books and records, do banking, create a system for selecting people for leadership roles, and participate in regular and democratically run meetings.

The *practice* of gardening involved individual households, and although a CoP was developing during the time this fieldwork took place, the long-term implementation of this practice failed. The authors learned subsequently from MSSRF staff that nutrition gardening has been unsuccessful due to a prolonged drought, limited access to seeds, and a lack of technical support following the end of the APM project. Although home gardens in other areas have had long-term success in improving food and nutritional security for small-scale farmers (Buchmann, 2009; Torquebiau, 1992), the contexts in which they exist (environmental conditions, access to resources) and the preferences and skills of practitioners influence the sustainability of the practice (Galhena et al., 2013; Márquez & Schwartz, 2008). Nutrition gardening in the Kolli Hills has not proven to be a sustainable practice, but many gardeners indicated that learning about these practices was useful and meaningful, particularly as they related to developing an understanding of the nutritional benefits of fresh produce.

By contrast, pond fish farming has become a sustained *practice* in the Kolli Hills, but like nutrition gardening, there have been challenges, including one pond failing due to drought. Participation is a challenge for members of the group fish ponds who must travel a distance from surrounding

villages to take part. Women involved with one of the collective fish ponds located near to a temple also face challenges in participating, as Hindu tradition does not allow women who are menstruating to approach the area. The costs of transporting fishlings to the Kolli Hills are high, and there is also a significant loss of fishlings during transport. The hope of creating hatcheries in the area failed because of the lack of water; however, farmers have identified other fish hatcheries in the region and regularly access them on their own. Furthermore, after getting help from professional fishermen from the surrounding plains during initial harvests, pond fish farmers now have the skills to carry out their own harvests.

Despite these explanations provided to us regarding the ongoing sustainability of one food production practice and the discontinuation of the other practice, the question remains as to why this outcome occurred, given that both CoPs experienced the prolonged drought and the termination of access to inputs and expertise provided by the APM project. Perhaps the answer lies in the predominantly gendered nature of these two practices and the higher potential of fish farming for income generation. The novelty of fish farming collectives as a more formal and structured initiative with viable income and employment opportunities, and the prevalence of men in leadership and other key roles, may have drawn higher community value than the household and individual nature of nutrition gardening, which was primarily women and children's work. Furthermore, being part of a fish farming collective provides access to new market channels and distributes the associated costs and risks among participants (Yamamoto, 2013).

Both nutrition gardening and pond fish farming were selected to be introduced by the APM project because they built upon traditional practices of uncontained gardening and river fishing. The APM project provided resources to help improve

upon these traditional practices through the development of CoPs. The sustainability of these practices and the CoPs depended on factors internal to the communities (e.g., leadership and knowledge mobilization) as well as external factors (e.g., rainfall and market potential). Most importantly, what makes a CoP succeed depends on both the individual interests and resources of the members, and the goals and objectives of the community as a whole. Wenger (2000) reminds us that a successful CoP is dynamic, involving open dialogue within and outside the community, and with oscillations in the level of participation. If a CoP maintains a focus on shared values and creates excitement about the communal learning that exists, the group can weather difficulties (Wenger, McDermott, & Snyder, 2002).

The contribution of small-scale agriculture to food security is undeniable. In order to ensure that this practice continues to thrive, it is essential that farmers have access to relevant information as well as social spaces and opportunities in which their accumulated knowledge can be mobilized. The CoP approach allows researchers to understand how farmers come together to learn and mobilize knowledge for sustainable food production. Researchers and development workers need to be aware of the importance of knowledge co-creation and sharing and the fluidity and adaptability of a learning community, and be sensitive to changing physical and social contexts in different communities.



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Accessing local foods: Households using SNAP double bucks and financial incentives at a Midwestern farmers market

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Abstract

Farmers markets have flourished in recent decades as alternative distribution outlets for small-scale, organic producers. However, one persistent challenge for farmers markets is attracting a diverse range of patrons across the wide socio-economic spectrum. This issue is even more critical when focused on individuals with a limited budget for

food expenditures. Thus, we surveyed SNAP and non-SNAP users who attend a Midwestern farmers market in order to investigate motivations for attendance, local food values, and the role that financial incentives play in affecting attendance. Additionally, we compared our findings with our previous research on households who receive SNAP and do not attend the farmers market. Our results underscore that the SNAP users at the market have much in common with their non-SNAP market-going counterparts. There are also several critical differences between market-going SNAP users and the non-going SNAP users. In conclusion, while our results show financial incen-

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tives work to reduce the reproduction of economic privilege at the farmers market, additional initiatives are required to address other food access barriers and to promote food justice in this important and expanding space.

Keywords

Farmers Markets, Local Food, SNAP, Double Market Bucks, Financial Incentives, Parks Department

Introduction

The number of farmers markets nearly doubled between 2008-2014, from 4,685 to 8,497 (USDA AMS, 2015). These direct-to-consumer food markets have long been touted as a method to increase community food security (Kantor, 2001); while consumers have better access to fresh, healthy, and organic foods, producers gain economic and social support from their local communities.

Scholars point to a number of benefits, both individual and communal, derived from thriving farmers markets. For example, farmers capture more revenue in direct-selling schemes (La Trobe, 2001; Mann et al., 2018), local and regional food systems can enhance food security (Allen, 1999), markets allow consumers to signal a desire for sustainable consumption options (Seyfang, 2006), shoppers attend markets for both food purchasing and entertainment (Farmer, Chancellor, Gooding, Shubowitz, & Bryant, 2011), health benefits can accrue from increased fresh fruit and vegetable consumption (Herman, Harrison, Afifi, & Jenks, 2008), and the environment benefits from increased caloric reliance on fruits and vegetables (Godfray et al., 2010) that supplant animal-based products; these are all touted benefits.

Community development is also seen as an indirect benefit from a successful farmers market, particularly those markets that cater to a diverse swatch of a community's population. As noted by Mann et al. (2018) and others, the acceptance of Supplemental Nutrition Assistance Program (SNAP) benefits within the local food sector is perceived as a way to enhance community development via economic development benefits (Bell, Mora, Hagan, Rubin & Karpyn, 2013). A second

and related example includes the spillover effects of consumer spending. This is the idea that certain consumers who attend farmers markets are the same individuals who will shop at nearby establishments as they venture to and from the market (Cummings, Kora, & Murray, 1999). This has been used as evidence to support positioning markets in areas that need visitor bolstering. Other scholars have found that markets are a means for the production of social and community capital as patrons are able to visit with friends, acquaintances, and community leaders (Oberholtzer & Grow, 2003). Finally, market location can provide community benefits in locales with few other food outlets, such as the case in Flint, Michigan (Sadler, 2016).

Unfortunately, farmers markets can also have negative consequences: they have frequently been charged with serving primarily affluent and white users while neglecting the needs of those living in poverty and minority populations (Farmer, Chancellor, Robinson, West, & Weddell, 2014; Markowitz, 2010; Hinrichs & Kremer, 2002). Critics also caution against overly optimistic interpretations of the local food effects that farmers markets can have on communities (Hinrichs, 2000; Hinrichs & Kremer, 2002). Especially with regard to low-income populations, local foods can be more expensive than conventionally produced foods. The privilege of eating local (Farmer et al., 2014) has meant that farmers markets often remain inaccessible to many low-income households. The price of foods at farmers markets are complicated and often highly debated as comparing prices in and outside of farmers markets is difficult. Several researchers have found farmers market prices to be higher than the price of similar items at surrounding supermarkets (Garrett, 2014; Lucan, Maroko, Sanon, Frias, & Schechter, 2015). However, other reports point to the prices being quite parallel (Vermont Agency of Agriculture, Food and Markets, 2016; McDaniel, 2014). The accuracy of such arguments are likely quite contextual to the farmers markets in question. Other barriers include the geographic location of the markets and market open times. Farmers markets are most commonly positioned in affluent, white areas (Singleton, Sen, & Affuso, 2015), and potential low-income participants experience a range of access barriers, includ-

ing lack of time and inadequate transportation (Walker, Keane, & Burke, 2010). Local foods are also limited by season and are more labor intensive to locate and prepare; thus, they may be perceived as an impractical food solution for many potential consumers (Leone et al., 2012). In addition to physical and economic barriers, several socio-cultural factors may deter the patronage of some populations, including SNAP recipients (Guthman, 2008). Characterized by the actual bodies present at the market (Slocum, 2008) and the cultural and environmental values of market founders and managers (Alkon, 2012), farmers markets can be unwelcoming or inadequate to subpopulations within a community (DeLind, 2006).

In an attempt to remedy economic issues, farmers markets across the U.S. have engaged in initiatives to increase equitable access to local foods among households with low income, particularly among participants of the Supplemental Nutrition Assistance Program (SNAP), the Senior Farmers Market Nutrition Program (SFMNP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). These are fairly recent developments, beginning circa 2005 (Winch, 2008); hence, little research has been done to assess the efficacy of these financial incentives and their impact on the affordability and accessibility of farmers markets to households with low income. While recent scholarship has highlighted the benefits of economic incentive programs to specific segments of farmers markets (Oberholtzer, Dimitri, & Schumacher, 2012), few have assessed these initiatives within a framework that also considers the embedded socio-cultural values of participants and demographic privilege. Thus, the overarching question of this study is: *to what extent does the implementation of financial incentives at farmers markets work to mitigate food insecurity by reducing barriers between low-income households and local foods distributed at farmers markets?*

Consumers participating in local food networks, such as farmers markets, cite several motivations, barriers, and disincentives for participation. Recreation and leisure were the most frequently reported reasons for participation amongst farmers market shoppers in Indiana, USA (Farmer et al., 2011). These shoppers also reported that

they valued supporting local farmers and were motivated by the quality, freshness, and variety of foods available at farmers markets, as well as the ability to know where and how the food was produced. Major constraints to participation, as reported by these shoppers, were the monetary cost of food and the lack of convenience, relative to surrounding supermarkets. During 2012, low-income households in Bloomington, Indiana, claimed essentially the same motivations—quality, freshness, and variety of foods—similar barriers to participation—cost and inconvenience—as well as a general lack of information about the farmers market (Babb, 2013).

A study by Farmer et al. (2014) systematically compared the food values of farmers market participants with that of nonparticipants. The researchers looked at 12 categories of food values collected from the literature: environment, nutrition, local farmers, fewer chemicals, local economy, fresh food, hormone free, organic, whole foods, humane, seasonal, local (within 100 miles [161 km]), and costs of food. Farmers market participants ranked all food-value motivations higher overall than non-farmers market participants. Environmental and nutritional motivations ranked the highest among participants. These two motivations ranked fifth and twelfth, respectively, among nonparticipants. This illustrates a connection between food values and participation in local food networks.

Also illustrated are the complex social barriers that may exclude many from participating, including gender, education, income, social connectedness, and ethnicity. Wolf, Spittler, and Ahern (2005) found that farmers market goers were generally younger, were more likely to be female, were more likely to be married, had a higher educational attainment status, and had a higher income level compared to the general population. Zepeda (2009) found that those not going to farmers markets were more interested in the convenience of purchasing food, were single, and in a single-parent household; Zepeda (2009) found no difference in income between market shoppers and non-attendees. Yet, others have found that location and facilities, the market atmosphere, and time constraints pivotally affect participation in farmers

markets, acting as either barriers or disincentives (Colasanti, Conner, & Smalley, 2010). Specifically, Calasanti et al. (2010) found that female Latinas were most likely to find the aforementioned variables to be critical components in making the decision to shop or not to shop at a farmers market.

The SNAP has increased food security for millions across the U.S. while alleviating the severity of poverty among low-income households, particularly those with children (Tiehen, Jolliffe, & Gunderson, 2012). Specifically, the acceptance of SNAP benefits at farmers markets has been shown to *reduce* nutritional disparities within communities (Jones & Bhatia, 2011), but physical barriers have deterred SNAP use at these outlets. Food stamp redemption at farmers markets decreased drastically during the 1990s as states transitioned to electronic benefits transfer (EBT) systems (Kantor, 2001). EBT cards, which function like debit cards, have posed a problem for farmers markets that do not have a telephone line, internet, or electricity to process EBT transactions (Markowitz, 2010). To promote equitable access to farmers markets, the 2008 U.S. Farm Bill allocated 10.0% of funds in the Farmers Market Promotion Program to helping farmers markets acquire the means to accept EBT cards. In San Francisco, the acceptance of EBT was mandated for all farmers markets in 2006. Since then, SNAP receipts have increased on average 57.0% each year, with a 91.0% increase between 2009 and 2010 (Jones & Bhatia, 2011). Still, even when SNAP transactions are enabled at farmers markets, the cost of foods remains another barrier to participation.

While a consensus has not yet been reached (Mann et al., 2018), some researchers have found the price of foods at farmers markets to be higher than the price of similar items at surrounding supermarkets (Garrett, 2014; Lucan et al., 2015). Thus, in 2005, private and non-governmental organizations began offering financial incentives that double the value of SNAP, WIC, and SFMNP coupons at farmers markets (Winch, 2008). Financial incentives at farmers markets in New York City, Boston, and San Diego have impacted the vegetable consumption of some mothers (Dimitri, 2015). Hicks and Lambert-Pennington (2014) also found similar patterns with SNAP being accepted

at markets, thus driving engagement amongst those with low socio-economic status. Indeed, participants with limited access to fresh fruit and vegetables in their communities and whose consumption averages less than two servings of vegetables each day were more likely to increase vegetable consumption using the incentives at the farmers market. This research suggests that financial incentives may help low-income consumers who already attend or are interested in the market; but, further research is needed to understand how to incentivize the most vulnerable consumers—those with the most limited access to fresh fruits and vegetables and households using emergency food outlets, such as food banks and pantries.

Multiple studies have purported positive outcomes from matched farmers market incentive programs. Lindsay et al. (2013) found that participants in matched programs reported nearly a 16-fold increase in eating *healthy* or *very healthy* when compared to their eating behavior prior to being part of an incentive match program. Participants were almost unanimous (93.0%) in stating that the matched program was vital to their decision to shop at a farmers market. Studies that looked at similar market buck programs found that participants reported eating more fruits and vegetables due to such programs (Bowling, Moretti, Ringelheim, Tran, Davison, 2016; Payne et al., 2013).

In this paper, we perform an exploratory comparison of SNAP and non-SNAP users at the Bloomington Community Farmers' Market (BCFM), as well as a comparison between SNAP market users and SNAP users not attending the market. We did this comparison to assess the efficacy and importance of financial incentives for SNAP participants at the BCFM. In doing so, we ask the following research questions:

1. What are the similarities and differences between SNAP and non-SNAP households at the farmers market?
2. What are the similarities and differences between SNAP users attending the BCFM and SNAP users who do not?
3. How important are financial incentives, particularly the double market bucks program, to SNAP households attending the farmers

market and for bringing new SNAP households to the farmers market?

We understand that farmers markets are not the panacea for food insecurity; rather, they are just one outlet for promoting both household and regional food security. Because farmers markets are not necessarily culturally appropriate for all communities, we expect to find that individuals with similar motivations and values attend farmers markets. Therefore, we hypothesize that, while household income levels and educational attainment will differ between SNAP and non-SNAP users, few, if any, other differences (food values, value for local food and farmers, market behaviors) will exist between the two groups. Additionally, we hypothesize that the double market bucks program will be an important consequence to SNAP users already attending the BCFM; however, we hypothesize that this financial incentive is not vital to bringing new, diverse populations to the market, particularly those who have no prior interest in shopping at the BCFM and those who face more than just economic barriers to participation.

Methods

This study is part of a larger community-based participatory research (CBPR) project that has sought to improve food security in and around Bloomington, IN, through the use of local foods. We chose the CBPR approach because it combines the knowledge, skills, and assets of local people and organizations and those of professional scientists to develop practical and applied solutions to pressing issues (Fortmann, 2008) that work toward a socially just end (Strand, Marullo, Cutforth, Stoecker, & Donohue, 2003). Consequently, we had three community partners that collaborated with the professional researchers on the overall project. These included Monroe County United Ministries, the Local Growers Guild, and Bloomington Parks and Recreation.

The current study is the final phase of a four-

part study.¹ In this paper, we discuss Phase 4, with highlights from Phase 1 (Farmer, Minard, & Edens, 2016). The current manuscript predominantly includes results from a questionnaire used to survey SNAP and non-SNAP users attending the BCFM. Phase 1 was a door-to-door survey in neighborhoods that are characterized as low and mixed income in the City of Bloomington. We use overlapping questions and corresponding data from the two phases as part of our analysis.

Study Site

This survey was administered at the Saturday BCFM in Bloomington, Indiana. Bloomington is a town of approximately 83,300 residents (City of Bloomington, 2016) and is located in south-central Indiana approximately 60 miles (96 kilometers) from the state capital, Indianapolis. Bloomington is located in Monroe County, population 137,974. The population of Bloomington has a median age of 23.4 years and is 83.0% White, 4.6% Black or African American, 8.0% Asian, and 3.5% Hispanic (of any race). Indiana University's flagship campus is located in Bloomington, which does have a significant effect on the city's economy, demographics, and culture.

The BCFM was established in 1975 and is the state's largest farmers market by number of vendors and visitors. Counts for the attendance at the Saturday farmers market during the summer have often exceeded 10,000 visitors in recent years. The City of Bloomington's Parks and Recreation Department manages the market, which is located in the heart of the city adjacent to the Shower's Building (i.e., the headquarters for the city government). Positioned a few steps from the city's main urban trail corridor, the market draws patrons on bike, foot, bus, or arriving in private cars. The 75+ vendors sell products beginning in early April through late November. Common products include Indiana classics such as sweet corn, tomatoes, squash, and green beans, while also tapping into international cuisine items such as kohlrabi,

¹ Phase 1 included door-to-door structured interviews of residents in neighborhoods characterized as low and mixed income. Phase 2 entailed a mail survey to farmers servicing the local community. Phase 3 included informal, in-depth interviews with key informants working for social service and food and/or agricultural agencies. Phase 4 included a questionnaire used to survey SNAP and non-SNAP users at the Bloomington Community Farmers' Market.

Asian greens, “pet” food dairy products (cow and goat products being legally sold for pet consumption only; however, they are often consumed by humans), honey, hot peppers, and a variety of ready-made hot items. Beyond patrons and farmers, the market is home to musicians busking for dollars, a few clowns on occasion, and folks attending for a morning coffee, scone, and visit with friends.

The Double Market Bucks Program (DMBP) began in the summer of 2013 and is funded by private donations. Once per week, SNAP participants can trade up to US\$18 in SNAP benefits for double the value (up to US\$36) in Market Bucks. Market Bucks are issued in US\$3 increments and are used like cash by market goers, except vendors cannot give change for Market Bucks. At the end of market hours, vendors redeem the Market Bucks they received for cash. After one year of the DMBP, the receipt of Market Bucks increased five-fold and EBT transactions more than doubled at the BCFM (Wooten, 2013). Market Bucks receipts increased another 17.0% in 2014 before decreasing by 4.0% during 2015 (Lay, 2015).

As of 2012, the majority of households with low incomes surveyed in Bloomington were interested in shopping at the community farmers market but were experiencing a range of economic, physical, and cultural barriers; at that time, food pantries were the main connection between low-income households and local foods in Bloomington (Babb, 2013). The DMBP was implemented at the BCFM in 2013, and during that season, SNAP receipts more than doubled (Wooten, 2013), indicating that this financial incentive has been successful in some regard. Overall, these financial incentives are relatively new, and few studies have assessed the utility of such initiatives implemented at farmers markets. Moreover, the cost of foods at farmers markets is just one potential barrier to participation. In this paper, we assess the utility of the DMBP from the perception of SNAP participants. In an exploratory fashion, we compare the demographics, values, motivations, and behaviors of SNAP participants at the farmers market with those of non-SNAP participants. We consider the aforementioned variables as explanatory and question whether the DMBP works to negate such

variables at the BCFM. We do this by comparing market SNAP users to market non-SNAP users; we also compare market going SNAP users to our previous research results conducted in neighborhoods dominated by low-income households who use SNAP benefits.

Data Collection

The 28-item survey instrument was developed in partnership with representatives from our collaborating agencies, BCFM, the Local Growers Guild, and Monroe County United Ministries. BCFM was particularly invested in this, as the survey also served to query shoppers’ perspectives on current offerings. A prior market survey from 2010 helped inform the creation of the current instrument, which was designed to survey both SNAP and non-SNAP market shoppers and included a four-question section that pertained only to SNAP shoppers. The 28 items were a mix of multiple-choice, ranking, and fill-in-the-blank questions covering three categories of inquiry: farmers market experience, food values and household behavior, and demographics (see Appendix B). The instrument was piloted three times to clarify the wording and to make the questions more precise. SNAP and non-SNAP data collection mainly took place over four weekends in June and July of 2015, with an additional early August weekend used for SNAP data collection.

We used a convenience sampling approach with incentives. Non-SNAP users were offered a US\$5 market gift certificate as an incentive to participate in the 10-minute survey. SNAP users redeeming SNAP dollars for Market Bucks were asked if they would be willing to participate in BCFM research and were offered a US\$10 market gift certificate as an incentive. Our research team approached 278 non-SNAP users, of which 172 filled out a market survey. Of the 103 SNAP users approached, 89 filled out the survey. In 2014, the BCFM tallied 247 unique SNAP users attending the market.

Statistical Analysis

Descriptive results are presented in Appendix A, along with an analysis of variance (ANOVA) and chi-square comparisons between SNAP and non-

SNAP users. These analyses compare scores between the groups, testing for differences. ANOVAs were used to test for differences between the groups using continuous data, such as Likert scales, age, etc. Chi-square was used to compare categorical data, such as gender, educational attainment, etc. Between-group comparisons are included in Tables 1, 2, and 3, which encompass prompts from Questions 3 (commonly purchased products), 9 (motives for attending the farmers market), 10 (benefits from attending the farmers market), and 17 (values for local foods). We then used principal-components analysis (PCA) for questions 9, 10, and 17 in order to evaluate the relationship between prompts and across answers (Tables 2 and 3). The PCA allowed us to determine if relationships exist between various prompts and to combine prompt scores and develop composite means for later use in the regression analyses (Table 4). PCA statistics were developed and presented for questions 9, 10, and 17, and further consideration of each component was made using Cronbach's alpha scores for each component. Cronbach's alpha scores were used to determine the strength of a relationship between items. Components with a Cronbach's alpha level above 0.700 were used in further analysis, which is the common acceptable threshold (Field, 2013). We also delved specifically into SNAP user data in order to discern the importance of Market Bucks to their participation at the market; we also graphed beginning attendance at the BCFM, comparing SNAP vs. non-SNAP consumers.

Finally, we used regression analysis to understand what variables best predicted if someone was or was not a SNAP user. Fifteen different independent variables (see Table 4) were included in the analysis to determine the strongest predictors for distinguishing between SNAP (=1) and non-SNAP (=0) users. Regression analysis provides a basis for understanding how independent variables relate to a dependent variable (SNAP vs. non-SNAP in the current case).

Results

We present our results in three sections, starting with a description of the response rate and demographic results. Next, we review market behaviors,

motivations for attending the market and for engaging in local food systems, and the importance of Market Bucks for SNAP users. The final section presents a regression model used to better understand the differences in SNAP and non-SNAP market goers.

Survey Response Overview and BCFM Participant Profile

Our overall response rate was 68.4%, with SNAP users responding at 86.3% and non-SNAP users responding at 61.8%. Overall, participants were mostly female, White, about 42.5 years of age, had at least one child in the household, and attended religious services at least once a year (Appendix A). Market goers generally attended the BCFM 2.54 times each month during the season, had been attending for 8.5 years, and spent over US\$23 per visit. SNAP users at the market were more often female, younger, and with more children in the household; not surprisingly, they also had lower educational attainment, lower household incomes, and were more likely to be people of color (Appendix A). The SNAP users we surveyed at the farmers market were more likely to be female, to have attained a higher educational level, to have a higher income, to have less difficulty in getting to the grocery store, and to participate less frequently in religious services compared to the SNAP users from our Phase 1 study.

Market Behaviors

Little difference was found to exist in the market behaviors between the two populations surveyed. SNAP users attended the market 2.55 times per month, while non-SNAP users attended the market 2.53 times per month. Non-SNAP users had been attending the market on average 9.10 years, with SNAP users attending for the past 7.28 years. This was not statistically different. Similarly, the two populations spend fairly equitable amounts of out-of-pocket money per week, not including SNAP benefits (SNAP=US\$20.43; non-SNAP=US\$24.80; $p=.051$). Though duly noted, a p -value of .051 is marginally significant and on the cusp of being statistically significant beyond random chance). As a result of shopping at the market, no difference was found in the *amount* of fresh fruits

and vegetables purchased out of pocket between the two groups. However, a statistical difference was found in the *variety* of fruits and vegetables consumed. SNAP users indicated that attending the market increased the variety of their fruit and vegetable consumption more so than the non-SNAP users.

SNAP users also noted that shopping at the farmers market increased the amount of fresh fruits and vegetables that they consume (mean of 1.93 out of 5.00; 1=increased greatly, 2=increased some, 3=stayed the same, 4=decreased some, 5=decreased greatly). Participants were asked to report the foods they most commonly purchased while shopping at the farmers market. Food groups included fruits, vegetables, breads, honey, meat, cheese, other dairy, and eggs.

SNAP users reported buying all of these items, except breads and vegetables, more often than non-SNAP users (Table 1). Both groups used similar transportation methods for getting to market, with personal automobile transportation ranking highest followed by walking (although to a much lesser extent). Finally, we asked study participants how difficult it was getting to the grocery store. We had them rate the difficulty on a scale of 1 to 4 (1=very difficult, 2=difficult, 3=easy; 4=very easy). Difficulty in getting to the grocery store is used as a proxy for transportation as a barrier (Farmer et al., 2017). SNAP users responded with an average score of 3.11 (easy), which was statistically different from the average response of non-SNAP users: 3.47 (even easier).

Motive-Values

We also asked all study participants to rate their level of agreement regarding common motivations and values, as defined by the literature, pertaining to why one might attend a farmers market (see Table 2). The Likert-style scale was a 1-to-5, 1=

Table 1. Purchasing Behaviors of SNAP and Non-SNAP Users

	% Purchase	SNAP %	Non-SNAP %	Difference	P value
Fruits*	84%	91%	80%	11%	0.028
Vegetables	92%	94%	91%	3%	0.319
Breads*	22%	17%	35%	18%	0.042
Honey*	44%	55%	38%	17%	0.013
Meat***	26%	41%	22%	19%	0.000
Cheese*	18%	25%	15%	10%	0.047
Other Dairy***	5%	11%	1%	10%	0.000
Eggs**	32%	44%	26%	18%	0.003

* $p < .05$; ** $p < .01$; *** $p < .001$

strongly disagree to 5=strongly agree. The ratings of two motive-values were significantly different between the two groups: the desire *to learn about farming and gardening* and the desire *to purchase food inexpensively*. SNAP users scored these items significantly higher (at the $p < .05$ and $p < .001$ levels, respectively).

We conducted a PCA on the results of the motive-values to evaluate the relationship between the 12 items in this scale, as well as to be able to combine related variables into composite mean scores for later use in the regression analyses (which involved predicting what variables best identify the SNAP users vs. the non-SNAP users). The results detected the presence of one component with an Eigenvalue greater than one. The PCA met statistical rules and assumptions. The component is named based on the items grouping together at .400 or greater, as are the proceeding components discussed further on. Component 1 had a Cronbach's alpha score of .886 and explained 49.7% of the variance. This component included all items on the scale and was entitled *Market Motivations*.

Using a similar approach, we evaluated the motive-values for why individuals partake in local food systems. This battery of questions included 13 items and also used a 1–5 Likert-style scale of “strongly disagree” to “strongly agree” (Table 3). Five items returned significantly different results between SNAP and non-SNAP users, with SNAP users assigning higher scores—*I give preference to foods that are grown with few chemical applications* ($p < .05$), *The*

Table 2. Agreement with Common Motivations for Attending a Farmers Market: Overall and Group Mean Scores as Well as PCA Results from Q9 of the Survey (1=strongly disagree to 5=strongly agree)

I go to the FM because I want...	Overall	SNAP	Non-SNAP	Component 1 ("Market Motivations")
Fresh food	4.66	4.62	4.68	.713
Food with higher nutritional value	4.35	4.54	4.25	.734
Food with fewer synthetic chemicals	4.48	4.58	4.42	.809
More variety	4.00	4.05	3.97	.677
Easier access to fresh food	4.15	4.24	4.11	.641
To purchase food inexpensively***	3.29	3.84	2.97	.417
To learn about farming and gardening*	3.25	3.56	3.07	.498
Recreation opportunities	3.65	3.80	3.57	.486
To consume foods grown sustainably	4.29	4.34	4.26	.793
To support sustainable farming practices	4.46	4.47	4.45	.823
To support a local food system	4.60	4.63	4.59	.852
To support local farmers	4.65	4.64	4.65	.838
Overall		3.5	3.2	

* $p < .05$; *** $p < .001$

Table 3. Local Food Motive-Values from Survey Question 17 (1=strongly disagree through 5=strongly agree)

	Overall	SNAP	Non-SNAP	Comp. 1	Comp. 2	Comp. 3
Purchasing organically grown food is very important to me.	4.27	4.40	4.20	.868	.174	.032
I give preference to foods that are grown with few chemical applications.*	4.46	4.60	4.38	.853	.220	.113
I give preference to foods that were picked just a few days before my purchase.	4.34	4.47	4.28	.580	.437	-.195
The nutritional value of a food is an important part of my purchasing decisions.**	4.43	4.61	4.33	.725	.314	.049
I give preference to animal products that have been derived in a humane manner.	4.03	4.20	3.94	.221	.095	.805
I give preference to animal products that are free from growth hormones.	4.44	4.43	4.45	.629	.469	.469
The expense of fresh local produce deters me from purchasing it as often as I would like.*	3.55	3.78	3.42	-.049	.092	.548
I generally purchase whole foods, rather than processed foods.	4.08	4.16	4.04	.594	.278	.161
I give preference to purchasing foods that come from within 100 miles of my location.	4.13	4.23	4.08	.351	.687	-.011
I give preference to eating foods that are in season. For example, tomatoes in July-October.	4.23	4.17	4.26	.141	.724	.150
I give preference to food purchase decisions that support the local economy.*	4.48	4.63	4.40	.221	.844	.090
I give preference to food purchase decisions that support local farmers.	4.55	4.60	4.52	.306	.802	.116
I believe consuming food produced locally is better for the environment.*	4.56	4.68	4.50	.281	.696	.279

* $p < .05$; ** $p < .01$; *** $p < .001$

nutritional value is an important part of my purchasing decisions ($p < .01$), *The expense of fresh, local produce deters me from purchasing it as often as I would like* ($p < .05$), *I give preference to food purchase decisions that support the local economy* ($p < .05$), and *I believe consuming food produced locally is better for the environment* ($p < .05$). To test the statistical relationship between these results and to build composite variables for use in logistic regression, we performed a PCA on the 13 items in the battery. The results detected the presence of two useable components. The PCA again met statistical rules and assumptions. Component 1 had a Cronbach's alpha score of .855 and explained 44.6% of the variance. Component 1 included six items that focused on the preference of organic and/or chemical-free foods, fresh foods, nutritional foods, hormone-free foods, and whole foods. We entitled Component 1 as *Pure Food*. Component 2 had a Cronbach's alpha score of .860, an Eigenvalue of 1.305, and explained 10.0% of the variance. This component comprised items concerning fresh, hormone-free, locally produced, seasonal, and environmentally sound foods, as well as foods supporting local farmers and the local economy. We entitled Component 2 as *Locally Good Food*.

Utility of the Double Market Bucks Program

SNAP participants use Market Bucks on average 2.8 times a month and find them to be very important in one's decision to spend SNAP benefits at the Saturday BCFM (1.14 on a 1–4 scale with 1=very important and 4=not important). Surprisingly, 63 of 88 SNAP participants indicate that they would continue to shop at the BCFM if SNAP benefits were not accepted. SNAP users and non-SNAP users followed a parallel trajectory in participating in the farmers

market, with no statistical difference detected on either groups' rate of increased attendance over time. A statistical difference was not found. We also asked participants "How did you learn about the double market bucks program?" Nearly 42% of SNAP users learned about the program while in attendance at the farmers market; 17.2% learned about the program through their social network and another 17.2% through a social service agency.

Another battery of questions sought information as to the importance of the various benefits of attending the market (Table 4). We asked participants to indicate their level of agreement on the importance of eight different benefits gained from market attendance. The acquisition of *fresh food* ranked highest, followed by *safe food*, and *knowing how the food was grown*. When testing for differences between SNAP users and non-SNAP users, we found no statistical differences. In addition, we conducted a PCA to measure the relationship between the eight items and to develop composite variables for later use in the regression analysis. The results detected the presence of one component with an Eigenvalue greater than one. Again, this PCA met the statistical rules and assumptions warranting the combination of these variables into a single composite variable. Component 1 had a Cronbach's alpha score of .833 and explained 52.3% of the variance. We named this component *market benefits* (Table 4).

Table 4. Benefits of Attending the Farmers Market (1=strongly disagree to 5= strongly agree)

	Overall	SNAP	Non-SNAP	Comp. 1 ^a "Market Benefits"
Nutritional food	4.51	4.64	4.45	.806
Sense of belonging	4.13	4.18	4.11	.674
Fresh food	4.62	4.69	4.58	.762
Convenience	3.83	3.92	3.77	.601
Opportunity for recreation	3.92	3.95	3.90	.673
Social interaction with friends	4.04	3.94	4.09	.708
Knowing how my food was grown	4.23	4.37	4.15	.743
Safe food	4.32	4.44	4.25	.798

* $p < .05$; ** $p < .01$; *** $p < .001$

^aKMO: .882, Sig: .000, Chi-S: 932.285, CrA: .854, % of var: 52.364, Eig: 4.138 varimax

Finally, we conducted a binary logistic regression analysis in order to further explore the differences between SNAP and non-SNAP users at the farmers market (Table 4). Model 1 included 15 independent variables detailed in Table 5. We regressed the model on 1=SNAP user and 0= non-SNAP user. The model fit the data well, was significant at the .015 level, and met the parameters needed to justify interpretation. Four variables were significant, including money spent at the market (outside of SNAP benefits), the *market motivations* composite variable from Table 2, the number of children in the household, and the ease of getting to the grocery store. As scores changed in these four variables, the likelihood of being a

SNAP user did as well. This relationship is quantified via the odds ratio. For example, for one unit decrease in the ease of getting to the grocery store, the likelihood of someone being a SNAP user increased. Thus, the probability that a respondent will be a SNAP user increased by 43.5% for every unit decrease reported in the ease of getting to the grocery store. For the Q9 composite variable (market motivations), for each point higher (on the Likert scale) one's score moves, one is 10.9% more likely to be a SNAP user. Alternatively, for each dollar less (out of pocket) someone spent at the farmers market, he or she is 29.7% more likely to be a SNAP user. Finally, for each additional child in the household, one is 18.1% more likely to be a SNAP user.

Table 5. Summary Statistics of the Binary Logistic Regression Model to Predict SNAP User Status Among Farmers Market Goers

Model 1 (Step 4)	
Model Sign	.015
Hosmer Lemeshow	.369
Chi-Square	35.916
-2 Log Likelihood	228.104
Nagelkerke	.223
Percentage Accuracy	70.9% (87.8% FM; 40.3% SNAP)
Variables	B (S.E.; Exp(B))
Money spent at the farmers market	-.029 (.012; .972)*
Q9 Overall Component: Market Motivations	.743 (.324; 2.101)*
Ease of getting to the grocery store	-.730 (.231; .482)**
# of children in house	.454 (.231; 1.574)**
Attendance at FM as a youth	n.s.
Frequency in shopping at BCFM	n.s.
Q10 Overall Component: Benefits of shopping at the FM	n.s.
Q17 Component 1: Pure food	n.s.
Q17 Component 2: Locally good food	n.s.
Usual transportation mode to grocery	n.s.
Number of household members	n.s.
Gender	n.s.
Age	n.s.
Religiosity	n.s.
Miles to market	n.s.
Constant	-1.063 (1.572; .345)
AIC	236.104

S.E. Standard Error; *** $p < .001$; ** $p < .01$; * $p < .05$; n.s.=not significant

Discussion

This article centers on the nexus of demographics, motives, and experiential similarities and differences between farmers market SNAP and non-SNAP users, as well as SNAP users who do and do not go to the farmers market. Our results provide five salient points for further consideration and discussion.

First, the demographics of our survey respondents support some common findings in the literature while also shedding light on new insights: BCFM shoppers are predominantly female, White, and middle-aged. We also find that the majority have at least one child in the household and are likely to attend religious services at least once per year. A key difference in our current work compared to the

literature is the potential utility of religiosity in food justice movements. We found that SNAP users not attending the market participated more frequently in religious services than those SNAP users who frequent the farmers market. This finding is critical as religious affiliation can provide an avenue for communication; information about the farmers market—e.g., hours, location, foods available, SNAP use, prices, etc.—can be distributed through religious networks. Additionally, our comparison of SNAP and non-SNAP users at the farmers market, a new addition to the literature, reveals anticipated differences in educational attainment, ethnicity, and household income, as well as significant differences in gender, age, household size, and the number of children in the household. SNAP users at the market are younger, have more children, a larger household size, and are even more likely to be female. As expected, SNAP users that do not attend the market have lower household incomes and lower educational attainment and represent a more racially and ethnically diverse demographic. Of critical importance are the results highlighting the similarities and difference between SNAP users who attend the BCFM and those who live in the same city but do not attend. Specifically, the difference in the educational attainment and income results between SNAP users who attend the farmers market and those who do not is stark. The number of market-going SNAP users with degrees above a high school diploma (or equivalent) is quite large compared to non-market attending SNAP users. This is a critical finding for consideration as it suggests that education is a strong correlate to market attendance, at least at the BCFM. Likewise, the income level of the two groups is also vastly different. While both SNAP groups have relatively low-income levels, the results for those attending the BCFM show uniformity across low-income brackets than SNAP users not attending the market (which are grouped towards the lower end of the economic spectrum).

Second, transportation issues appear to be a challenge or barrier for both SNAP groups when compared to the non-SNAP users attending the market. The lack of a personal automobile is a recurring factor contributing to food insecurity among low-income households located relatively

far from food outlets (Walker et al., 2010). We used the question on the *difficulty of getting to the grocery store* as a proxy for transportation as a barrier. There were significant differences between non-market going SNAP users, market going SNAP, and non-SNAP users. Non-SNAP users found it easiest to get to the grocery, and market-going SNAP users followed suit. Our regression results (Table 5) show that the *ease of getting to the grocery store* was a major influence distinguishing SNAP users from non-SNAP users. Some research has found market attendees to be willing to travel farther to get to a market compared to those shopping solely at grocery stores (Parks et al., 2018); thus, we posit transportation as a critical barrier to examine when considering market placement and barriers to accessing local foods (Markowitz, 2010).

Third, SNAP users reported a greater variety of fresh fruits and vegetables consumed at home as a result of their participation in the farmers market. Our comparative analysis of SNAP and non-SNAP users reveals that only the SNAP group has increased their fresh fruit and vegetable consumption. Additionally, the *variety* within the food groups has also increased for the SNAP population. Moreover, SNAP users report that the DMBP has been “very important” for them and contributes to their decision to spend SNAP benefits at the BCFM. This suggests that financial incentives are increasing the health and food security of SNAP users in attendance at the farmers market. Interestingly, the vast majority of the SNAP users we surveyed claim that they would still participate in the BCFM even if SNAP were no longer accepted.

Both market-attending groups have similar out-of-pocket expenses (not including SNAP or matching funds). Considering the additional use of Market Bucks, this implies that SNAP users are spending more at the market in total. In fact, SNAP users purchased significantly more fruits, meat, dairy, eggs, honey, and other dairy products than their non-SNAP counterparts. Only bread was purchased less often by SNAP users, and vegetable purchases were not significantly different between the two groups. Thus, it is assumed that cascading nutritional benefits exist due to the increase in take-home products from the market

due to the DMBP. These findings corroborate the claim of many SNAP users that the DMBP is “very important” as an influencer to spend SNAP benefits at the market. These findings also suggest that the farmers market has become an important food outlet for SNAP users who attend the market.

Fourth, with regard to motivations for participation, there were more similarities than differences between SNAP and non-SNAP users at the farmers market. This underlines the importance of local, organic, sustainable foods to farmers market shoppers, regardless of household income. Motives for attending the market were all similar, with two initial exceptions. First, SNAP users claimed “learning about farming and gardening” to be a motivation significantly more often than non-SNAP users. This reveals that the farmers market is more than simply a food outlet; it is also an educational resource and a community of practice. Second, SNAP users claimed more often to attend the market “to purchase food inexpensively.” One possible explanation for this is that the SNAP benefits and the doubling of SNAP benefits drives down the prices for SNAP recipients by subsidizing their purchases.

Finally, we found SNAP users to report strong values for items often associated with purchasing food from farmers markets. Although not significant for all categories, SNAP users ranked the majority of these values (e.g., organic, freshness, humaneness) higher than non-SNAP users who attended the market. One statistically significant difference between the two groups was the belief that “consuming foods produced locally is better for the environment.” This was valued higher by SNAP users. Considering the greater number and severity of the challenges experienced by SNAP users attending the farmers market, we consider it likely that their participation requires higher values attributed to the foods available there. It may be necessary for SNAP households to value local foods in order to overcome the disproportionately higher number of access barriers they experience compared to non-SNAP households (e.g., transportation, price, etc.). Overall, the lack of differences in values of the two groups again reveals the importance of local food for both SNAP and non-SNAP users. This suggests that the implementation

of financial incentives at farmers markets may reduce certain access barriers for SNAP participants but may not attract SNAP users that do not have a high value for local foods.

There are key limitations of this study that merit further discussion. First, this research relies solely on survey work; we did not observe the behavior of participants at the market or conduct interviews, both of which would provide more depth to complement the breadth of our results. Participant observation and in-depth interviews would help us further assess the individual barriers people face as well as how to facilitate engagement. Along these same lines, we performed this research in a small Midwestern city with a single, dominant market. While this is helpful to understand how such a scenario attracts and retains different types of users, research that includes numerous sites from across a city or larger metro area would also be beneficial. Finally, future research should further address the ease of getting to the grocery store as a proxy for transportation barriers. Items such as transportation issues, store preference, and hours of operation could comprise a broader factor.

Conclusion

Overall, this study found that the acceptance of SNAP benefits at the farmers market benefits a segment of the SNAP population. Those using SNAP at farmers markets share many similarities with non-SNAP farmers market customers. There are also several differences between SNAP recipients who attend the market and those who do not. Additionally, we found that SNAP users are able to acquire similar or greater amounts of fresh, farmers market products compared to non-SNAP market attendees while spending about 17.7% less out-of-pocket than non-SNAP market attendees. Finally, we contend that transportation, or alternatively geographic placement, is a critical issue for SNAP recipients, particularly in a city with a single focal market that is centrally located away from and not adjacent to residential areas characterized by low-income households.

Our results have four primary professional implications for those working on farmers market participation (and local food systems), particularly

pertaining to the inclusion of low-income households. First, the results underscore, at least for this population, how economic incentives are a critical means for enhancing access to local fresh fruits and vegetables by subsidizing further purchasing power for low-income individuals. The majority of our respondents would attend the market without the acceptance of SNAP benefits (albeit likely going home with less product). Thus, if market organizers are interested in recruiting individuals who would normally not attend the market, our results point to transportation ease and geographic placement as critical elements for consideration. Offering smaller, satellite markets may help alleviate this barrier. Second, our results, particularly when compared against our earlier neighborhood survey (Phase 1), indicate that the market-attending SNAP users are more similar (with respect to specific variables) to the market-attending non-SNAP users than they are to SNAP users who do not frequent the market. This notion implicates the need to consider cultural fit at the market and how the market's own culture may attract or repel individuals. That said, farmers markets are not panacea-marketing ventures for attracting all individuals, and a diversity of distribution and procurement options are critical to bolstering accessibility and inclusion in a local food system. Third, this research highlights the nutritional benefit and impact of market bucks programs. Having a double-buck program suppresses financial barriers while simultaneously prompting people to purchase local, healthy food. Finally, food system professionals may want to consider how to network with and through faith-based organizations. In this way, they can take advantage of the systems already in place that are serving as critical safety nets for food

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security for low-income households. One prime example is the Fresh Stop Market organized out of the Shawnee Presbyterian Church in Louisville, Kentucky. Fresh Stop runs a host of fresh-food pop-up markets that distribute through institutions located in food-insecure neighborhoods. Churches are a common venue for this organization.

Working within a food justice framework requires more than simply increasing financial access to food; managers must also consider the types of food available at the market and the values advertised and addressed by the managers of this food space. While recognizing that farmers markets may not be culturally appropriate or desirable for all households, communities should continue to assess both the accessibility of farmers markets to interested households and the acceptability of other localization strategies to those not interested in the farmers market. Therefore, we encourage professionals and researchers to collaboratively work with low-income neighborhoods as part of any food localization initiative. Doing such will allow residents to share their views about which food values are important. It also allows professionals and researchers to consider other desirable connections between low-income households and local foods. As every community differs in needs, resources, and culture, we contend that the Community Based Participatory Research approach remains a critical way forward. 

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Appendix A. Demographic Results and Comparison between Neighborhood Groups

Variables	Overall	FM SNAP Users (<i>n</i> =89)	Non-SNAP Users (<i>n</i> =160)	Phase 1 SNAP Users (<i>n</i> =50) ^a	<i>p</i> -value between FM SNAP & Non-SNAP	<i>p</i> -value between FM SNAP & Phase 1 SNAP
Gender					.165	.000****
Male	25.2%	17.98%	29.38%	33.33%		
Female	73.6%	79.78%	69.38%	66.70%		
Other	1.2%	0.00%	1.25%	0%		
Mean Age	42.54	39.68	44.08	43.20	.070*	.377
Household Size	2.68	3	2.53	2.75	.065*	.601
Children in household	44.5%	1.34	.62	.52	.000****	.839
Educational Attainment					.000****	.000****
Did Not Finish High School	2.8%	5.62%	1.25%	35.30%		
High School or GED	9.2%	13.48%	6.88%	33.30%		
Some College	18.4%	24.72%	15.00%	17.60%		
Associate's or Technical Degree	10.8%	15.73%	8.13%	5.90%		
Bachelor's Degree	27.6%	24.72%	28.75%	5.90%		
Master's Degree	22.8%	12.36%	28.75%	2.00%		
Professional/Doctoral Degree	8.4%	2.25%	11.25%	0.00%		
Ethnicity					.082*	.530
African American or Black	4.0%	6.74%	2.50%	13.70%		
American Indian or Alaska Native	0.8%	2.25%	0%	2.00%		
Asian	4.8%	3.37%	5.63%	3.90%		
Hispanic	3.6%	5.62%	2.50%	3.90%		
White	86.0%	80.90%	88.13%	74.5%		
Other	0.8%	0%	1.25%	2.00%		
Household Income Level (all US\$)					.000***	.002***
\$0-\$15,000	24.6%	44.94%	11.88%	74.50%		
\$15,001-\$30,000	23.3%	41.57%	11.25%	11.70%		
\$30,001-\$45,000	12.9%	11.24%	13.13%	2.00%		
\$45,001-\$60,000	8.8%	0%	12.50%	0%		
\$60,001-\$75,000	7.9%	0%	11.25%	0%		
\$75,001-\$90,000	3.8%	0%	5.00%	0%		
\$90,001-\$120,000	7.9%	0%	11.88%	0%		
\$120,001-\$150,000	3.8%	0%	5.63%	0%		
\$150,001-\$180,000	2.5%	0%	3.75%	0%		
\$180,001-\$250,000	3.3%	0%	5.00%	0%		
\$250,001+	1.3%	0%	1.88%	0%		
Religiosity					.92	.000****
Weekly Attendance	22.4%	20.22%	23.13%	30.20%		
2 to 3 Times per Month	4.9%	3.37%	5.00%	0.00%		
Monthly	5.3%	5.62%	5.00%	7.50%		
Several Times a Year	12.2%	15.73%	10.00%	11.30%		
Yearly	12.2%	12.36%	11.88%	5.70%		
Never	43.1%	37.08%	45.00%	45.30%		

(continued)

Variables	Overall	FM SNAP Users (n=89)	Non-SNAP Users (n=160)	Phase 1 SNAP Users (n=50) ^a	p-value between FM SNAP & Non-SNAP	p-value between FM SNAP & Phase 1 SNAP
Difficulty in getting to grocery store					.003***	.012**
Very Difficult	2.0%	4.5%	0.00%	20.80%		
Difficult	9.9%	18.2%	5.60%	24.50%		
Easy	39.3%	38.6%	40.10%	35.80%		
Very Easy	48.0%	36.3%	54.30%	18.90%		
Mean	3.34	3.11	3.47	2.53		

^a Phase 1 SNAP user data was derived from a neighborhood survey conducted in three locales in Bloomington, IN. Further details on this phase of the study can be found in Author Paper (Farmer et al., 2016).

* $p < .1$; ** $p < .05$; *** $p < .01$; **** $p < .001$

Appendix B. Survey Instrument: 2015 Bloomington Community Farmers' Market Survey
(following pages)

2015 Bloomington Community Farmers' Market Survey

Section 1: Farmers' market experience

1. While you were growing up, how often did you or your family shop at the following:

	Never	Yearly	Quarterly	Monthly	Couple X a Month	Weekly
Farmers' Market						
Roadside Stand						
U-pick Farm						

2. How many times per month do you shop at the Bloomington Community Farmers' Market (BCFM)?

3. What products do you most commonly purchase at the BCFM? (Select all that apply)

<input type="checkbox"/> Fruits	<input type="checkbox"/> Meat	<input type="checkbox"/> Ready-made foods
<input type="checkbox"/> Vegetables	<input type="checkbox"/> Cheese	<input type="checkbox"/> Other:
<input type="checkbox"/> Bread	<input type="checkbox"/> Other Dairy	<input type="checkbox"/> Other:
<input type="checkbox"/> Honey	<input type="checkbox"/> Eggs	<input type="checkbox"/> Other:

4. As a result of shopping at the farmers' market, the:

	Increased Greatly	Increased Some	Stayed the same	Decreased Some	Decreased Greatly
... amount of fresh fruits and vegetables I eat has					
... variety of fresh fruits and vegetables I eat has					

5. Do you find enough vendors selling the foods you want?

YES

NO

6. How many years have you been attending the BCFM?

PID: _____

2015 Bloomington Community Farmers' Market Survey

7. Are you satisfied with the variety of foods available for purchase? YES NO

If no, what additional foods would you like to see for sale?

8. How much money do you generally spend at the BCFM each visit (excluding SNAP or WIC benefits)? _____

9. Please indicate your level of agreement for the following statements on a scale from Strongly Disagree (**SD**), Disagree (**D**), Neutral (**N**), Agree (**A**), to Strongly Agree (**SA**).

I go to the farmers' market because I want...	SD	D	N	A	SA
Fresh food					
Food with higher nutritional value					
Food with fewer synthetic chemicals					
More variety					
Easier access to buying fresh food					
To purchase foods inexpensively					
To learn about farming or gardening					
Recreation opportunities					
To consume foods grown sustainably					
To support sustainable farming practices					
To support a local food system					
To support local farmers					

10. Please indicate your level of agreement for the following statements on a scale from Strongly Disagree (**SD**), Disagree (**D**), Neutral (**N**), Agree (**A**), to Strongly Agree (**SA**).

The benefits I receive from attending the farmers' market include:	SD	D	N	A	SA
Nutritional food					
Sense of belonging					
Fresh food					
Convenience					
Opportunity for recreation					
Social interaction with friends					
Knowing how my food was grown					
Safe food					

2015 Bloomington Community Farmers' Market Survey

11. Do you receive SNAP benefits (food stamps)?

No (Please move on to question #17)

Yes

12. About how many times per month do you use Market Bucks at the Saturday BCFM?
(check one)

This is my first time

Once a month

2-3 times a month

Every Saturday

13. How important is the Double Market Bucks program in your decision to spend SNAP benefits at this farmers' market?

Very

Moderately important

Slightly important

Not important

14. If SNAP benefits were not accepted at the market, would you continue to shop at the BCFM?

No

Yes

15. How many SNAP/EBT dollars do you redeem each month at the BCFM? _____
(do not include Market Bucks in this number)

16. How did you learn about Double Market Bucks program?

At the farmers' market (from staff or poster/advertisement)

Farmers' market website or Facebook

A friend or family member

Newspaper or radio

Local soup kitchen or food pantry

From a social service agency

Other:

2015 Bloomington Community Farmers' Market Survey

Section 2: Food Values and Household Behavior

17. Please rate your level of agreement with the following statements concerning local foods: Strongly Disagree (**SD**), Disagree (**D**), Neutral (**N**), Agree (**A**), to Strongly Agree (**SA**).

	SD	D	N	A	SA
	▼	▼	▼	▼	▼
Purchasing organically grown food is very important to me.	<input type="checkbox"/>				
I give preference to foods that are grown with few chemical applications.	<input type="checkbox"/>				
I give preference to foods that were picked just a few days before my purchase.	<input type="checkbox"/>				
I would prefer that all Genetically Modified Organism (GMO) foods sold at the Bloomington Community Farmers' Market be labeled.	<input type="checkbox"/>				
The nutritional value of a food is an important part of my purchasing decisions.	<input type="checkbox"/>				
I give preference to animal products that have been derived in a humane manner. <input type="checkbox"/> Not applicable (I'm vegan)	<input type="checkbox"/>				
I give preference to animal products that are free from growth hormones.	<input type="checkbox"/>				
The expense of fresh local produce deters me from purchasing it as often as I would like.	<input type="checkbox"/>				
I generally purchase whole foods, rather than processed foods.	<input type="checkbox"/>				
I give preference to purchasing foods that come from within 100 miles of my location.	<input type="checkbox"/>				
I give preference to eating foods that are in season. For example, tomatoes in July-October.	<input type="checkbox"/>				
I give preference to food purchase decisions that support the local economy.	<input type="checkbox"/>				
I give preference to food purchase decisions that support local farmers.	<input type="checkbox"/>				
I believe consuming food produced locally is better for the environment.	<input type="checkbox"/>				

18. Please rate the following in terms of importance for your food purchasing decisions:

	Not a Priority	Low Priority	Neutral	Moderate Priority	High Priority
Chemical Free					
Convenience					
Freshness/Quality					
Locally produced					
Nutrition					
Price					

2015 Bloomington Community Farmers' Market Survey

18. Please indicate your involvement in the following activities (one selection per line):

Activities	Yes	Used to	Never
Food preservation (i.e. freezing, canning, etc.)			
Composting			
Recycling			
Vegetable gardening: at home			
Vegetable gardening: in a community garden plot			
Eating vegetarian/vegan			
Support or belong to an environmental organization(s)			
Reading about food nutrition			
Reading nutrition labels on food packages			

Section 3: Demographics

19. How do you usually get to the grocery store?

- | | |
|---|---|
| <input type="checkbox"/> Personal vehicle | <input type="checkbox"/> Bike |
| <input type="checkbox"/> Walking | <input type="checkbox"/> Shared Carpool |
| <input type="checkbox"/> Bus | <input type="checkbox"/> Other: _____ |

20. How difficult is it for you to get to the store to buy groceries?

- Very difficult
 Difficult
 Easy
 Very Easy

20a. If very difficult or difficult, why? _____

20b. If very easy or easy, why? _____

21. How many people, including yourself, live in your household **full time**? _____

Of these, how many are below the age of 18? _____

22. What is your gender?

- Female Male Other: _____

23. What year were you born? _____

2015 Bloomington Community Farmers' Market Survey

24. What is your race/ethnicity?

- | | |
|--|--|
| <input type="checkbox"/> African American or Black | <input type="checkbox"/> Native Hawaiian or Other Pacific Islander |
| <input type="checkbox"/> American Indian and Alaska Native | <input type="checkbox"/> White |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Hispanic | |

25. How often do you participate in organized religious services/programs?

- | | |
|--|---|
| <input type="checkbox"/> weekly | <input type="checkbox"/> several times a year |
| <input type="checkbox"/> 2-3 times a month | <input type="checkbox"/> yearly |
| <input type="checkbox"/> monthly | <input type="checkbox"/> never |

26. What is the last grade/degree you completed in school? _____

- | | |
|---|---|
| <input type="checkbox"/> 1 st -4 th grade | <input type="checkbox"/> Some college no degree |
| <input type="checkbox"/> 5 th -6 th grade | <input type="checkbox"/> Associate's degree |
| <input type="checkbox"/> 7 th -8 th grade | <input type="checkbox"/> Bachelor's degree |
| <input type="checkbox"/> 9 th grade | <input type="checkbox"/> Master's degree |
| <input type="checkbox"/> 10 th grade | <input type="checkbox"/> Professional degree |
| <input type="checkbox"/> 11 th grade | <input type="checkbox"/> Doctoral degree |
| <input type="checkbox"/> HS / GED | |

27. What was your gross household income last year?

- | | |
|--|--|
| <input type="checkbox"/> \$0-\$15,000 | <input type="checkbox"/> \$90,000-\$120,000 |
| <input type="checkbox"/> \$15,000-\$30,000 | <input type="checkbox"/> \$120,000-\$150,000 |
| <input type="checkbox"/> \$30,000-\$45,000 | <input type="checkbox"/> \$150,000-\$180,000 |
| <input type="checkbox"/> \$45,000-\$60,000 | <input type="checkbox"/> \$180,000-\$250,000 |
| <input type="checkbox"/> \$60,000-\$75,000 | <input type="checkbox"/> \$250,000+ |
| <input type="checkbox"/> \$75,000-\$90,000 | |

28. What cross streets are closest to your house (closest intersection)?

a) _____

b) _____

Net yield efficiency: Comparing salad and vegetable waste between community supported agriculture and supermarkets in the UK

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Abstract

Food security is high on the global agenda. Two factors make it particularly pressing: the continuing rise in the global population, and the failure to adequately feed the current one. An area that has been the focus of much recent attention has been food waste; the Food and Agriculture Organization of the United Nations (FAO) estimates that as much as a third of all food is lost or wasted. This

paper argues that by taking a food system approach that accounts for yields as well as loss and waste in distribution and consumption, we can compare the contribution of different food systems to food security. A novel concept of “net yield efficiency” (NYE) is introduced that accounts for this. We present an illustrative case study of the levels of fresh vegetable and salad waste in the supermarket-controlled food system compared with a community supported agriculture (CSA) scheme. This case

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Authors Note

This paper is based on Nigel Baker’s Masters of Science thesis. Nigel had been further developing the ideas in this paper as a Ph.D. student before he passed away. His wish and that of his wife was to see his work published.

study explores whether the CSA and its members are less wasteful than the supermarket system. The study found that when all stages of the food system were measured for waste, the CSA dramatically outperformed the supermarket system, wasting only 6.71% by weight compared to 40.7–47.7%. Even accounting for difficulties in estimating waste, the findings underline the differences between these systems. On this basis, the paper argues that the NYE measure provides a more accurate picture of food system performance than current measures, which tend to focus on yield alone.

Keywords

Case Study; Community Supported Agriculture; Food Loss; Food System; Food Waste; Supermarkets; United Kingdom; Yield

Introduction and Background

Global food security is a high priority among food and agriculture experts and the world's governments, politicians, and media (Carrington, 2014; FIAN International, 2014). The 1996 World Food Summit defined food security as “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (WFS, 1996, Plan of Action, para. 1). Looking ahead, global food demand is set to double by 2050. Yet increasing production is constrained by slowing yield growth, limited arable land, global warming, and other environmental constraints (Ray, Mueller, West, & Foley, 2013; Tilman, Balzer, Hill, & Bafort, 2011).

Given these constraints on increased production, reducing food loss and waste (FLW) is an important step in addressing the world's food security concerns (Alexander, Brown, Arneth, Finnigan, Moran, & Rounsevall, 2017; Smith, 2013). The FAO suggests that one-third of food produced for human consumption is lost or wasted annually (FAO, 2011). Waste is particularly high for fresh fruits and vegetables, up to a third of which never reach supermarket shelves because of (often aesthetically driven) supermarket standards (Institution of Mechanical Engineers, 2013; Porter, Reay, Bomberg, & Higgins, 2018). Such levels of

FLW not only represent wasted resources such as land, water, and energy, but also contribute to greenhouse gas emissions.

The drivers of FLW are complex and multifaceted, with loss and waste occurring on-farm, in supply chains, and in households. Indeed, “The very extent of food losses and waste invites us to consider them not as an accident but as an integral part of food systems” (High Level Panel of Experts on Food Security and Nutrition [HLPE], 2014, p. 11). Food systems are increasingly complex and global, dominated by powerful corporate bodies motivated primarily by profit (McMichael, 2013). In this context, supply chain waste is driven by a combination of regulations, private grading standards, power differentials between farmers and retailers, and the expectations and behaviors of consumers (Porter et al., 2018). Household waste is similarly driven by a complex range of factors, including ambivalent attitudes toward waste; preferences regarding safety, taste, and freshness; age of household members; household size; and wider social, economic, and cultural structures (Schanes, Dobernig, & Gözet, 2018).

Given the complexity of food security, there is a need to re-examine the food system *as a whole* if food security priorities are to be achieved (Ingram, 2011). As conventionally grown food is almost all tied to the supermarket-controlled food system with high levels of FLW, this paper explores the idea that “alternative” systems, with organic production *and* closer producer-consumer relations, may be more efficient overall. Organic and low-input farming has a variety of recognized environmental benefits, including building long-term soil fertility (Rosset & Altieri, 2017). However, an extensive meta-analysis by de Ponti, Rijk, and van Ittersum (2012) suggests that organic agriculture yields are only 80% of those achieved by conventional farming (albeit with large variation). A key question for alternative food systems, therefore, is whether efficiencies in the rest of the system can compensate for a 20% field-yield deficit.

This paper introduces the concept of Net Yield Efficiency (NYE) as a tool for measuring the efficiency of food systems in both producing and distributing food. Specifically, we combine data on yield with data on FLW to estimate how much

food is actually consumed from a given farm area. We illustrate NYE by applying it to the case of Canalside, an organic CSA scheme in the UK. Data on farm and household FLW from the Canalside CSA and its members are compared with national averages in the UK for salad and vegetables. Because of the effective absence of a supply chain in the CSA model (as consumers collect their produce from the farm), our CSA data collection focused on household waste. The findings suggest that the CSA system generates less FLW in comparison to the supermarket-led system. We then combine the FLW data with the 20% yield deficit to show that the FLW reductions in the CSA system can compensate for lower yields, leading to a more efficient system overall. Although this case study is very small, it illustrates how NYE can help develop an improved, comparative understanding of the performance of different food systems.

Loss and Waste in Food Systems

Food loss and waste (FLW) has been defined as “a decrease at all stages of the food chain from harvest to consumption, in mass, of food that was originally intended for human consumption, regardless of the cause” (HLPE, 2014, p. 11). Food losses occur prior to the point of consumption, while waste occurs at the point of consumption. This definition can be widened to include potential food diverted to other purposes, such as meat production, biofuels, and other industrial needs. It can also include overconsumption and the consumption of highly processed, nutrient-deficient “empty calories.”

There are fundamental conceptual problems with FLW, which we can only address briefly here. These particularly concern how waste frequently re-enters ecological processes as organic matter, replenishing the soil and re-entering production. On-farm waste is commonly used in this way, and some supply chain and household FLW in the UK is returned to farming systems. It is also important to recognize that supply chain losses in the Waste and Resources Action Programme (WRAP) (2011) study (which we use below) include produce being sent to “an alternative market to the one intended,” composted, used for energy recovery, and sent to a landfill. Although some of these channels mean

that food is not completely wasted, much FLW still constitutes a real loss in terms of the land, labor, and other resources allocated to producing and distributing food that is never eaten.

Most attempts to measure FLW begin with all food grown or raised for human consumption. Tracking down such data is complex. At its most basic level, it involves knowing what is grown, how much leaves the farm, how much reaches the food processor, how much reaches the market, and how much is wasted by consumers. In measuring FLW along the food supply chain, an important consideration is to avoid including material that is genuinely inedible. Sometimes that is straightforward—cereal stalks left as stubble, for example. However, edible crops left in the field for economic, logistical, and/or retailing reasons are harder to track.

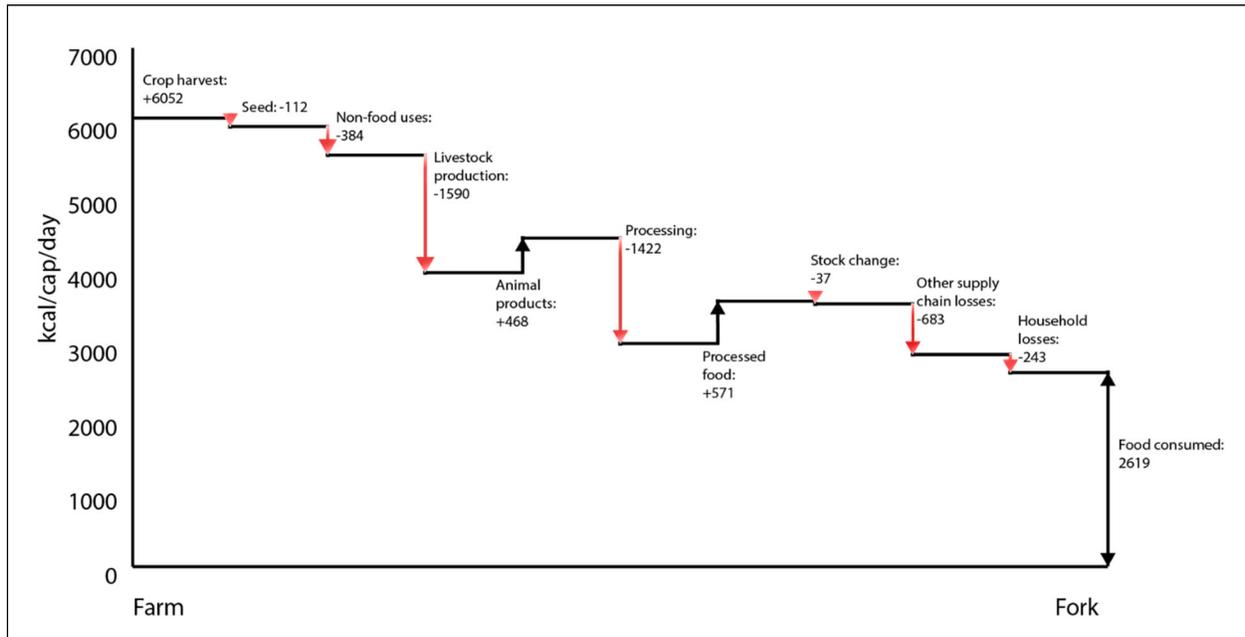
A very large proportion of primary biomass in agricultural systems does not enter the supply chain. This proportion of primary biomass makes up roughly 66% of the total energy value (Alexander et al., 2017). This consists mainly of agricultural residues in addition to unharvested crops and losses in the harvesting process. Figure 1 is a schematic demonstration of the major losses in the global post-harvest food system. It follows the transformations and losses of food as harvests move from farm to fork.

Food Loss and Waste in the UK

The UK’s Waste and Resources Action Programme (WRAP) has produced increasingly detailed and well-evidenced data throughout the UK food system, as well as standard definitions of different types of FLW (Table 1). The 2013 WRAP report, *Household Food and Drink Waste in the United Kingdom 2012*, is one of the most comprehensive studies of household food waste in the UK. A compositional analysis of food waste from 1,800 households was combined with waste audit data from local authorities and other studies to generate estimates of waste and its “avoidability.”

Supermarket-driven supply chain and household waste

Supermarket practices are arguably the biggest driver of FLW in the UK (Stuart, 2009). Supermarkets aim to sell as much food as possible, with the highest possible mark-up. Maximizing repeat

Figure 1. Schematic of Global Post-harvest Food Loss and Waste (FLW) (kcal per capita per day^a)

Reproduction of a diagram in Lundqvist, de Fraiture, & Molden (2008) based on data from Alexander et al. (2017) for the year 2011. See Alexander et al. (2017) for a more detailed representation in a Sankey diagram. This diagram is based on a world population of 7 billion.

^a Kilocalorie (kcal) is the British term for the U.S. Calorie.

Table 1. Definitions of Household Food Waste

Terms	Definition	Examples
Avoidable Food Waste (AFW)	Food and drink thrown away that was, at some point prior to disposal, edible.	Bread, apples, meat
Possibly Avoidable Food Waste	Food and drink that some people eat and others do not or that can be eaten when a food is prepared in one way but not in another	Bread crusts, potato skins
Unavoidable Food Waste	Waste arising from food or drink preparation that is not, and has not been, edible under normal circumstances	Meat bones, egg shells, pineapple skin, tea bags

From Waste and Resources Action Programme [WRAP], 2009, p. 4.

business is their main goal, and in this sense it could be argued that consumer wastefulness is actually beneficial to supermarkets. Household food waste of 22% by volume (WRAP, 2009) potentially equates to 22% more sales.

The supermarket-led system is analogous to an industrial process, characterized by uniformity, standardization, and long, often complex, supply chains. Fresh fruit and vegetables in particular do not conform easily to these systems. They are not naturally uniform, standardized, or suited to a long

supply chain; offer little opportunity for added value; have a short shelf life and an unpredictable supply; and less favorable produce is often rejected by consumers. These qualities mean that they are not the sort of food supermarkets prefer to sell. As noted by the HLPE (2014), “the standardization of the products offered to consumers is a major cause of food losses and waste in modern retailing systems” (p. 15). Blythman (2004) quotes one supplier saying, “supermarkets would stop selling fresh, unprocessed food entirely if they thought they

could get away with it [. . .] They stock it because they have to, because people expect it” (p. 69).

Because supermarkets must sell fresh fruit and vegetables, much ingenuity and expense have gone into ensuring that the produce is easy to manage. Packaging systems and temperature-controlled supply chains allowed Tesco (a large UK-based supermarket chain), for example, to increase the shelf life of their fresh vegetables from five days in 1987 to 11 days in 2002 (Gustafsson, Jonson, Smith, & Sparks, 2009). While such processes ought to reduce FLW, the restrictions on size and shape that come with them do not. Meeting supermarket quality standards is consistently reported as the dominant factor in supply chain waste in the UK. For example, supermarkets will reject tomatoes for a 5% size variation, light scarring or blemishing, imperfect shape, and variation in color or ripeness (Blythman, 2004). Although EU standards have been cited in the popular press as drivers of this type of waste, UK supermarket standards tend to far exceed these (WRAP, 2011).

Even the most technologically aware grower cannot produce near identical vegetables. Nonetheless, the complete control that supermarkets have over growers enables them to impose severe contractual terms. This includes making growers responsible for meeting “quality” standards and “take-back” clauses that allow retailers to return produce to suppliers. Thus, in order to attempt to meet supermarket demands, the first thing a grower will do is to overproduce. As noted in

WRAP (2011), “no supplier wishes to be ‘short’ and will trade off delivery to their customers ‘in full’ (as well as on time) for high levels of field waste” (p. 36). According to one National Farmers Union (NFU) official, planting 140% of the contracted amount is “not an unstandard example of the industry being inefficient to avoid shortfall” (Stuart, 2009, p. 109).

Table 2 illustrates data from a 2009 study of fruit and vegetable supply chain waste in the UK. While total supply chain waste varies considerably by crop (15–42%), the waste that results from grading—largely a matter of supermarket standards—is consistently a high proportion (50–80%) of that amount. The levels of fruit and vegetable supply chain losses provided here are also comparable with a Europe-wide figure of 33% (FAO, 2011).

In response to the supermarket-driven standardization of produce, over the last 30 years consumers have come to expect and then demand the same set of criteria. This expectation of perfection means that consumers have little tolerance once fruit and vegetables begin to lose their superficial luster after purchasing. Consumers are also extremely unlikely to purchase “substandard”-looking vegetables from other sources, making such produce unmarketable. Supermarkets also encourage excess purchasing through special offers. To a limited extent, this can help move seasonal gluts, although there is little relationship between special offers and the seasons. Smaller

Table 2. Examples of Losses in the UK Fruit and Vegetable Supply Chain (S/C)

Product	Field losses	Initial grading	Storage	Grading at packing stage	Retail	Average S/C losses	Average % loss due to grading
Onion	3–5%	9–20%	3–10%	2–3%	0.5–1%	28.3%	61.0%
Potato	1–2%	3–13%	3–5%	20–25%	1.5–3%	38.3%	79.7%
Apple	5–25%	5–25%	3–4%	3–8%	2–3%	41.5%	49.4%
Broccoli	3% ^a	10% ^a	0%	0%	1.5–3%	15.3%	65.6%
Average	5.9%	11.9%	3.5%	7.6%	1.9%	30.8%	63.3%

Adapted from WRAP (2011, p. 72) using UK-grown fresh fruit and vegetables where all supply chain figures were available. Averages (in bold) are the authors’ calculations. These are based on simple averages that do not take into account the relative quantities produced. Where a range of figures is given, the midpoint was taken.

^a WRAP data give field losses for broccoli as 10%, and initial grading as 3%, but they note that “grading is primarily done at picking; hence, there is a high proportion of field waste” (2011, p. 55). We have taken a high proportion as 70% and therefore re-allocated seven percentage points from field losses to initial grading.

households, who usually waste a higher proportion of the food they buy (Brook Lyndhurst, 2007; Parfitt, Barthel, & MacNaughton, 2010) are caught in the dilemma of “missing out” on such special offers. With perishables, in particular, special offers can lead to considerable FLW.

Another issue linking supermarkets to consumer behavior is the use of food labeling. Only about half of consumers understand the meanings of “best before” and “use by” labels (Brook Lyndhurst, 2011). Another study suggests that 34% of consumers “attributed food waste to food going past the date on the label and 21% will not take a risk with a product close to its date, even if it appears fine” (Brook Lyndhurst, 2007, p. 15). Supermarkets are naturally risk-averse. Consequently, the safety margin on much date labeling is often overly cautious and difficult to justify in consumer protection terms (HLPE, 2014). Despite not being legally required, “best before” date labels are frequently appended to packaged fruit and vegetables (Stuart, 2009). However, some supermarkets in the UK have recently begun to change how they date and sell fresh produce (BBC News, 2018).

Community Supported Agriculture (CSA)

CSA is a partnership between farmers and the local community, providing mutual benefits and reconnecting people to the land where their food is grown (Community Supported Agriculture, 2018). CSAs exist in many forms, but their basis is that there is an element of risk-sharing between producer and consumer, as well as direct connectivity between consumers and how and where their food is grown. They are primarily products of post-industrial societies, reflecting consumer and producer dissatisfaction with the dominant food paradigm under which they are disconnected from the land and from each other. CSA members typically commit to paying for a share of the harvest over a long period of time, rather than purchasing specific items of produce. For farmers and growers, CSAs can offer greater financial security because of the commitment given by CSA members. Sharing the financial risks of crop failure with the community (as well as the bonuses of bountiful harvests) also provides a degree of financial security. In addition, CSAs offer farmers an escape from the vagaries of

the supermarket supply chain and very often the chance to farm without damaging the sustainability of the soil and the environment. For consumers, being a CSA member is about reconnecting with food, knowing where it comes from, how it was grown, and that it is healthy and usually organic.

In 2011, the number of CSAs in England stood at 80, providing fresh food (primarily vegetable and salad crops) to 5,000 households. Their total area is around 3,200 acres (1,295 hectares), and annual sales are £7 million (about US\$9 million) (Saltmarsh, Meldrum, & Longhurst, 2011).

The relationship in a CSA between the consumer and the producer, as well as between the crop and the land, is entirely different to that between a supermarket shopper and the source of his or her basket of goods (Kneafsey, Cox, Holloway, Dowler, Venn, & Tuomainen, 2008). In terms of overall FLW, what is potentially most significant is the absence of a complex, retailer-dictated supply chain. In essence, there is no supply chain for a CSA; there are only the producer(s) and the consumers. There remain certain points in the CSA system where waste is possible—specifically in regard to the harvesting process, storage, and what is not collected by CSA members. The absence of a formal grading process seems to be the CSA’s main advantage in reducing supply chain waste. Any waste that does arise is generated on the farm itself, and it can directly re-enter the ecosystem through composting (as with on-farm losses in the supermarket system). The lack of a complex supply chain may also help to explain why CSAs can supply food at a lower cost to consumers, especially for organic food (Cooley & Lass, 1998; Pinkerton & Hopkins, 2009).

The direct relationship between producer and consumer entails an effective absence of supply-chain waste. What is less clear is whether and how participation in a CSA affects household waste. While supermarkets drive FLW through all the mechanisms discussed above, CSAs also have the potential to encourage FLW, for example, by giving consumers less choice over what they receive. This study, therefore, focuses on whether CSA members are less wasteful than typical supermarket shoppers, leading to a more efficient system overall.

Methodology

The Concept of Net Yield Efficiency

This paper proposes Net Yield Efficiency (NYE) as an important indicator of the efficiency of food systems. NYE is a measure of the yield actually consumed—not simply what is grown. In other words, it combines farm productivity data with FLW data to arrive at a figure that describes a food system’s effectiveness at producing food and delivering it to the fork.

$$\text{NYE} = \text{yield} - \text{supply chain waste} - \text{household waste}$$

Canalside

Canalside Community Food is an organic CSA scheme situated just outside Leamington Spa in Warwickshire, UK. Launched in 2007, the scheme provides vegetable shares for around 150 households, all year round. Canalside grows all the produce that goes into their vegetable shares; that is, they do not purchase produce to supplement their harvest. Table 3 shows approximate yield data for selected crops produced organically at Canalside, which uses intensive and protective cropping. The produce is overwhelmingly seasonal, supplemented by produce that can be stored (usually root vegetables). Inevitably, the amount and type of produce vary significantly throughout the year. At seasonal peaks, members receive large quantities of certain vegetables, and it is common for members to give surplus produce to friends and family. Members also understand that there are times when the size of the share will be relatively small.

Table 3. Estimated Yields Produced per Crop at Canalside CSA

Crop	Planted area (m ²)	Total yield	Equivalent per hectare
Squash	840	3000kg	36 tons
Beetroot	580	2500kg	43 tons
Celeriac	360	600kg	17 tons
Carrot	1000	3600kg	36 tons

Estimated yields of selected produce by Canalside CSA using intensive and protective cropping. Source: Canalside CSA, 2013.

Members collect their shares directly from the farm, selecting, weighing and bagging up their own vegetables according to the size of their share (small, medium, or large). The very act of handling and weighing out the produce enhances the sense of connection. Most produce is picked on the day it is collected; however, produce in winter and spring often includes a significant amount of stored late-autumn harvest.

This study gathered household vegetable and salad waste data from 28 of Canalside CSA’s 150 members (18.7%) in June and July 2014. We used this data to estimate levels of avoidable food waste (AFW) that could be compared with the UK-wide WRAP data for vegetable and salad FLW.¹ Although conducted on a smaller scale and at a different time of year, the methodological approach to measuring waste in our study is sufficiently similar to the WRAP study to make valid and illustrative comparisons.

Calculating CSA Household FLW and Comparable WRAP Figures

Data were collected across two groups. The first group (15 participants) received kitchen caddies and were asked to collect any waste from their CSA shares over a period of two weeks. Participants were not asked to self-sort the waste and instead returned the caddies at the end of each week for waste to be weighed and analyzed (by Baker). After the second week, the caddies were redistributed to the second group (13 participants), and the process was repeated. A brief exit interview conducted after the food waste collection was complete collected data on household size, whether they

consumed fresh vegetables from other sources (besides the CSA), consumption preferences (vegetarian or not), and whether they thought participating in the CSA affected their levels of household waste. Data from the two groups were combined and treated as a single sample. This approach kept costs low and allowed more participants to be included.

¹ WRAP FLW data were collected in September–November 2007 for WRAP (2009) and April 2013 for WRAP (2013).

Canalside CSA shares are typically allocated by the weight of each type of produce. This means that when members arrive to collect their produce, they are told, for example, that they are entitled to 1 kg (2.2 lbs.) of potatoes. We took these allocated weights as the basis for each participant's actual shares (rather than weighing each participant's share as they collected it). Occasionally, the share would include "one or two of" an item. This was the case with cucumbers, fennel, and calabrese during the study. For these crops, average-sized examples were weighed to give a fair weight-value.

To ensure comparability with the WRAP data on AFW, inedible portions of both the share and the returned waste were removed from the calculations. The share was considered 80% edible. This figure was reached by preparing a sample medium share over four weeks and cross-referencing it against the Ministry of Defence (2014) guidelines for conversion factors of purchase weights to edible weights of produce. Edible waste was distinguished from inedible waste through a direct examination of the returned waste. Potentially avoidable waste and potentially inedible elements of the share (e.g., root vegetable skins) were excluded from the calculations to ensure a comparable estimate of AFW. The combined weight of edible vegetable and salad waste was compared to the weight of the edible share to calculate the rate of household waste.

For comparison with the household WRAP data, adjustments were needed to reflect the different types and quantities of fresh vegetables and salads between the WRAP study and this study. This meant using disaggregated figures of salad waste and vegetable waste from WRAP (2009) and combining them in accordance with the proportion of salads and vegetables in the CSA share (which had a higher proportion of salad than the WRAP study).² Unfortunately, disaggregated data were not published in the WRAP (2013) study, so we could not make the same adjustment. As such, we have presented below (Table 4) both the unadjusted

figure for the 2013 study (21%, Figure 2) and our adjusted figure for the 2009 study (30.3%).

Calculating CSA On-farm Waste

The Canalside food chain is very simple, comprising on-farm waste and household waste only. Using the HLPE (2014) definition of FLW cited above, the on-farm FLW comprises unharvested edible crops, storage losses, and harvested crop (excluding very poor quality pest-damaged and undersized produce) not distributed to members. This study was unable to collect data on unharvested edible crops and storage losses, although they are assumed to be low. In general, the only produce that does not reach the consumer is the lowest quality, small, or badly damaged produce, storage losses, and occasionally perishable leafy vegetables at times of peak supply.

At Canalside, if there is a surplus of produce, it is made available to members as extras. When not all extras are taken, they become waste and are composted on-site (we classified these as on-farm waste). The extras will occasionally include lower quality or undersized vegetables, which in a supermarket-led system would not reach the retailer. During the four-week study period, the researchers recorded the total harvest (for all shares) and weighed and recorded the on-farm waste (i.e., extras which were not taken by any CSA members). In-field losses (e.g., unharvested produce or produce damaged in harvest) were not recorded. Despite the very low quality of the untaken extras, their composition was analyzed and found to have a *lower* proportion of inedible waste than the household shares.³ Ninety percent of the on-farm waste was found to be edible and, thus, avoidable.

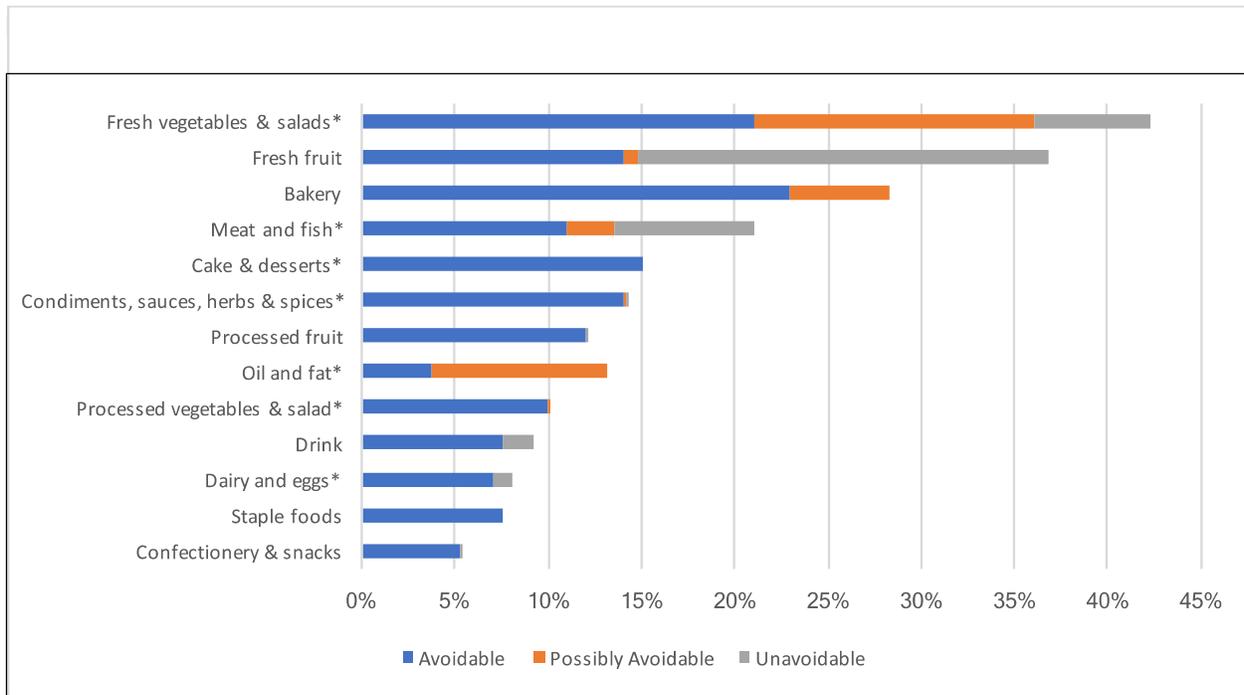
Results and Discussion

Avoidable Food Waste in Canalside

Participants were predominantly two-adult households, four of which had children; four participants

² The adjusted figure is derived from the rate of vegetable waste (19.1%) and the rate of salad waste (45.4%) in WRAP (2009) and the average relative amounts of vegetables (57.4%) and salad (42.5%) in the CSA shares. The unadjusted figure in WRAP (2009) is 20.7%. This figure is very similar to the one in WRAP (2013).

³ This was due to waste mainly coming from entirely edible salad produce.



* Indicates relatively low confidence in the % estimate, mainly due to food changing category between purchase and disposal. Note that for fresh vegetables and salads, the % is considered an underestimate.

Source: Waste and Resources Action Programme [WRAP], (2014).

were single-adult households. Only two households reported being vegetarian or vegan. The average household avoidable food waste (AFW) for Canalside members by weight was 6.1%. This is more than threefold lower than the unadjusted WRAP (2013) figure of 21%, and almost five times lower than the adjusted WRAP (2009) figure of 30.3%. Although this result must be treated cautiously (for reasons discussed below), it is a substantial difference. Individual participants' waste did vary considerably, with AFW values ranging from 0.4% to 16.6% of the edible share (Figure 3). There was no clear pattern across the different share sizes (15 households were receiving a medium share, 12 a small share, and one a large share). The average total household waste (including all avoidable, potentially avoidable, and unavoidable waste) from the Canalside CSA share was still only 19.1%.

At the same time, on-farm AFW accounted for only 0.65% of the edible harvest. Total on-farm waste over the four-week period was 11.7 kg (25.8 lbs.), 10.5 kg (23.1 lbs.) of which was considered edible. Total production was just over two tons (4,409 lbs.), of which 1,610 kg (3,550

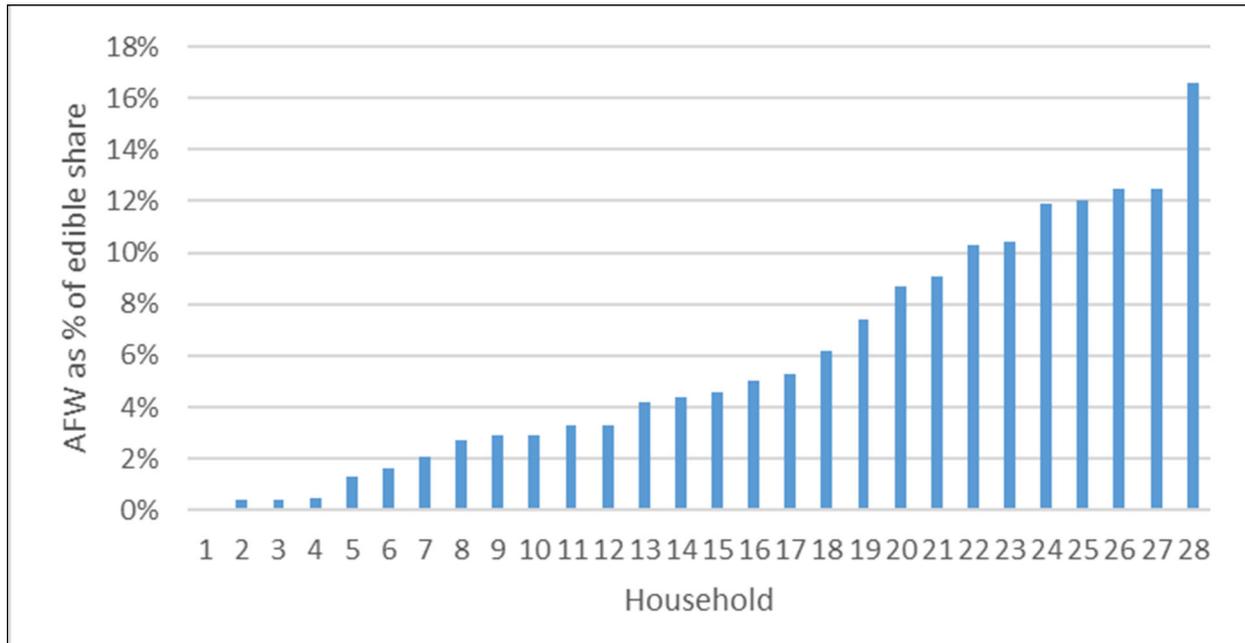
lbs.) were considered edible. The extremely low figure of on-farm waste reflects the very limited grading that takes place before the food reaches the consumer. These results are summarized in Table 4.

As a food system, we estimate food loss and waste (FLW) in the supermarket-led system as being between 40.7% and 47.7%, compared to only 6.71% for Canalside. Levels of both supply-chain and household FLW are much lower for the CSA than for the supermarket-led system.

NYE in Canalside

Net Yield Efficiency (NYE) aims to reflect that food production and consumption do not exist in isolation of each other; they are part of interlinked processes within a food system. The question that this research posed was: Allowing for yield differences between conventional and organic production methods, could an alternative food system (such as a CSA) still outperform the supermarket food system in terms of yield by taking food losses into account? The evidence displayed in Table 5 suggests that this is so. Organic food systems, on

Figure 3. Canalside Members' Avoidable Food Waste (AFW) by Household



average, produce a field yield of only 80% of that of conventional systems (Ponti et al., 2012). However, the supply chain and household waste in the CSA system are substantially lower than that in the supermarket system. The lower level of FLW in the CSA system more than offsets the yield deficit. This suggests that from the same (hypothetical) hectare, the CSA system (exemplified by the Canalside CSA) is substantially more efficient than conventional farming and the supermarket food system overall.

Another way to express the data in Table 5 is to say that, given the levels of waste in the two systems, the conventional (supermarket) yield must be between 1.57 and 1.78 times that of the organic (CSA) yield for the NYEs to be equal. This is well beyond de Ponti et al.'s (2012) yield difference of 1.25.

Interpreting the Results

This study illustrates the value of a food systems approach and NYE in comparing conventional and alternative food systems. By looking at the food system as a whole, we can add less FLW and a higher NYE as potentially important advantages of alternative food systems.

We have suggested that a CSA, through its short supply chain and lower household waste, can be more productive overall than a supermarket-led system. However, the data on which we based the comparison are limited. We stress that, in using a

Table 4. Complete Food Chain Comparison of Food Loss and Waste (FLW)

Food system	Supply chain FLW (% of food grown)	Household AFW (% of purchased food)	Total food chain FLW (% of food grown) ^a
Canalside CSA	0.65%	6.1%	6.71%
Supermarket (WRAP 2013)	24.9% ^b	21%	40.7%
Supermarket (adjusted WRAP 2009) ^c	24.9% ^c	30.3%	47.7%

^b Total food chain FLW is cumulative, rather than the simple addition of supply chain and household FLW. For example, Canalside CSA total FLW was calculated as $0.0065 + (1 - 0.0065) * 0.061 = 0.0671$.

^c This figure excludes in-field losses (5.8%, see table 2), as no comparable figures were gathered for the CSA. In Table 5, field losses are estimated at 5% for both food systems.

^d See methodology section.

Table 5. Community Supported Agriculture (Canalside CSA) and Supermarket Net Yield Efficiency (NYE)

Farm type	Hypothetical field yield (tons/hectare) ^a	Field losses (%) and crop left (t/ha)		Supply chain losses (%) and food remaining (t/ha)		Consumer AFW (%)	NYE (t/ha)
CSA (Canalside data)	8	5%	7.6	0.65%	7.55	6.1%	7.09
Supermarket (WRAP 2013)	10	5%	9.5	24.9%	7.13	21.0%	5.63
Supermarket (adjusted WRAP 2009)	10	5%	9.5	24.9%	7.13	30.3%	4.97

^a The hypothetical field yield (metric tons/hectare) is not meant to represent actual yields for any crop, but to represent that organic yields are on average 80% of those on conventional farms, as reported by de Ponti et al. (2012).

single case study with a small number of participants, we can only illustrate the application of the NYE approach rather than make claims about the wider applicability of the findings. Generally speaking, estimates have been used both from the CSA data and in the form of extrapolations from the WRAP study, which make a number of assumptions. In particular, the estimates of supply chain losses in the supermarket system (WRAP, 2011) are based on interviews with suppliers rather than a systematic collection of quantitative data along supply chains. We have also simplified the WRAP data ranges to simple averages. For the CSA data, we are confident that, in most cases, estimates are cautious and over-, rather than underestimate AFW. Nonetheless, we collected data from a small sample of self-selected CSA members, which may not be representative of the entire membership. Although the WRAP study was intended to be representative of England and Wales, it is based on the collection of waste over just one week. The CSA study presented here covered two weeks of waste (for each study group). Waste levels are likely to be highly dependent on the varieties and quantities produced, particularly for the CSA, where members have little choice in what they receive. While the WRAP data was seasonally adjusted, the CSA data was not.

Although the Canalside CSA operates in a very similar way to other CSAs, and so might be considered typical, the data here is not representative of all CSAs. Some CSAs operate more like “box-schemes,” involving partial supply chains where the produce from multiple farms is distributed with varying degrees of directness to the end consumer.

Furthermore, the CSA is a specific form of a food system, and not all organic production systems have associated short supply chains. Other systems may create more distance between the producer and the consumer, creating the possibility of additional FLW.

As far as we are aware, no other study has been conducted with the same methodology. Studying additional CSAs would have been beneficial but was beyond the practical resources available. Nevertheless, there is reason to believe that the WRAP data on AFW is robust and suitable to be used for comparative purposes.

Clearly, attributing any causal effect of supermarket-led and CSA food systems on household waste is problematic. The behavior and attitude of study participants cannot be solely attributed to their membership in Canalside. Those joining a CSA (and, further, those choosing to participate in this study) likely have an above-average understanding of food and environmental issues, including food waste. However, participation in the CSA appears to have reinforced any self-selecting predisposition. The exit interview revealed that 85% of participants thought that being part of Canalside positively influenced their attitude toward waste, with just over half suggesting it was a major influence. This echoes the findings of a study of another CSA: “Over the duration of their involvement they had become increasingly enrolled into, and motivated by, the wider value system in which the CSA is situated” (Kneafsey et al., 2008, p. 64). The exit interview also identified that most households bought fresh vegetables from other sources (ranging from 0% to 100% more than what

they received from the CSA) over the study period. Although we did not look at the waste arising from this, it would be interesting to look at how different sources of produce affect household waste practices.

From discussions with participants, it was clear that being a member of Canalside increased the amount and range of produce they consumed. Due to advice from Canalside staff and conversations with others, they were also eating more parts of the produce—which would come under WRAP’s definition of potentially avoidable food waste. Because the produce was organic, members knew that if they washed off the dirt, root vegetables did not need to be peeled (although some members still did so), while parts like brassica leaves and stalks were eaten by many. As all harvested edible produce was made available either within their share or from the extras box, Canalside members were eating a large amount of produce that would not have been acceptable according to supermarket standards. It would be interesting, as part of a further study, to estimate just how much of that produce would meet the “cosmetic” standards required by supermarkets.

Conclusions

This small study, looking at one local food scheme feeding 150 families, gives a glimpse of a way of producing and distributing food that minimizes associated food loss and waste (FLW). The tiny amount of waste on the supply side at the Canalside CSA demonstrates how much of an impact standards concerning edibility and marketability can have on FLW in the mainstream supply chain. Food losses on the farm are of no benefit to the farmer. For the most part, they represent a real financial loss. The only beneficiaries of FLW are supermarkets. Similarly, consumer AFW in the UK costs the average household £470 (about US\$608) annually. This figure represents a considerable amount of extra sales for supermarkets: 19% extra sales by weight and 14% by value (WRAP, 2013). It is perhaps this more than anything else that tells the story.

Understanding food systems in their entirety includes looking at production and distribution, as well as consumer actions and behaviors. The concept of Net Yield Efficiency (NYE) developed here offers a simple way to combine yield and FLW. It contributes to the need for studies that explore structural elements in food waste and use objective measures of household waste (i.e., sorting waste) (Schanes et al., 2018). It may also serve as a starting point for further development of a measure of systemwide efficiency, for example by including nutrient losses through food processing and incorporating overconsumption.⁴ We have demonstrated how the community supported agriculture model, by taking into account production yield and the waste generated by supply chains and households, can be more efficient than supermarket-led systems. Attaining such efficiencies will be crucial to attaining food security in the future.

Of course, improving the efficiency of food systems is only one element of food security. Many questions remain about the CSA model, including its causal role in consumer behavior and whether it can be scaled up to meet the needs of the world’s highly urbanized populations. There are also questions about whether CSAs are representative of broader society, specifically regarding their inclusion of marginalized groups. Race, income, and class-based inequalities are often (inadvertently) reproduced in local alternative food systems (Allen, 2010), such that those who are food insecure do not have the opportunity to benefit from them.

It is clear that current global food systems are in need of radical re-appraisal. The CSA model is just one of many alternative food systems, and it must be considered alongside other short, local supply chain models. We suggest that the NYE framework offers a useful tool for comparing these models. Further research that deploys the NYE framework to CSAs and similar models, both in different contexts and at larger scales, is needed. 

⁴ This was Nigel Baker’s original intention.

Acknowledgments

This paper is based on the late Nigel Baker's Masters of Science thesis. Nigel had been writing this paper and had begun to further develop the ideas for his Ph.D. before he passed away. His wish

was for this work to be published.

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Challenges and sustainability of wheat production in a Levantine breadbasket: The case of the West Bekaa, Lebanon

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Abstract

The farming sector in Lebanon, particularly grains production, is threatened by environmental, socio-economic, and political factors that have led to a high dependence on food imports, thereby undermining national food security. This study focuses on wheat production in its natural Mediterranean habitat (the Levant) and its sustainability in the West Bekaa through value chain analysis that aims

to identify constraints and opportunities in the production system. The analysis is based on a survey at the level of the producers to identify the planted wheat varieties, wheat production systems, land tenure systems, marketing channels, socio-economic factors of farmers, and different types of wheat by-products. This study reveals important challenges facing the sustainability of wheat production, including farmers resorting to hybrid

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Authors' Contributions

S. T. T. and S. H. designed the study. A. C. designed the sampling method and analyzed the data statistically. S. T. T. and M. C. analyzed the data and wrote the manuscript. A. C. and S. H. contributed in improving the data analysis and discussion sections. S. K. contributed in improving the manuscript.

wheat varieties, the dependence of farmers on wheat subsidies as an incentive, the lack of land tenure security, and the virtual absence of well-organized cooperatives. On the other hand, our evidence suggests a strong dependence among wheat farmers on integrated production systems that promote agricultural sustainability. We conclude this report with recommendations to secure the sustainability of wheat production in West Bekaa in particular, and in Lebanon in general.

Keywords

Farming Systems, Levant, Lebanon, Subsidy, Sustainability, Wheat

Introduction

Sustainable Food Production

Our food system has become highly globalized and industrialized, and the way our food is produced, distributed, and consumed has become unsustainable. This has thus contributed to unsustainable economies, environmental damage, and health problems (Caraher, Dixon, Lang, & Carr-Hill, 1999). In response to such constraints, localism has been proposed as a form of resistance against the homogenizing effects of globalization (Gottlieb & Joseph, 1997), and locally based food systems have become indispensable for attaining sustainable agriculture and food security (Allen, 2010).

Local food systems (LFS) are those in which the production, processing, trading, and consumption of food are integrated to promote the environmental, economic, social, and nutritional health of a specific geographic area (Fisher, 1997). That being said, understanding the production value chains of crops, which is the primary aim of this study, can aid in the promotion of LFS by facilitating the identification of leverage points to effectively valorize local products and support local farmers.

The Near East, an area characterized by a rich topographical diversity with an abundance of contrasting and changing environments, is home to both rich plant diversity and rich cultural innovations (McCorrison & Hole, 1991). It is one of the regions where numerous types of temperate-zone agriculture originated 10,000 years ago and where wild relatives and landraces¹ of enormous genetic diversity can still be found (McCorrison & Hole, 1991). Cereal culture, including cultivated strains of wheat and barley, originated in the Levant² and expanded northward from its natural Mediterranean habitats into central Europe in the 6th millennium B.C (Kislev, 1984). It traversed from the Fertile Crescent through northern Iran to central Asia, and westward to Europe through southwestern Anatolia (Quitta, 1971), and it expanded to the islands of Cyprus, Crete, and Malta in the 6th and 5th millennia B.C. (Follieri, 1973). However, the genetic diversity of many of the major crops and forage species in this region is threatened (Chalak & Sabra, 2015). In Lebanon, several wild relatives and landraces of important crops, including wheat, barley, food and forage legumes, and fruits trees, have been reported (Chalak & Sabra, 2015). Their conservation is crucial to sustain agricultural biodiversity and food security at the local and global level, as well as to sustain the livelihoods of local communities which are the main guardians of valuable agrobiodiversity (Anderson, 2003; Assi, 2005). In addition, these wild relatives and landraces are some of the main ingredients in a wide variety of traditional Lebanese processed foods, such as *kishk* (made of durum wheat and milk from local breed goats), *shankleesh* (a yogurt-based cheese), *dibs el roumman* (pomegranate molasses), dried fruits (figs, cherries, etc.), and edible wild plants commonly used in traditional cuisine. Investing in research that contributes to sustaining these landraces is therefore crucial to secure Lebanese culinary heritage, food security,

¹ A landrace is “a dynamic population(s) of a cultivated plant that has historical origin, distinct identity and lacks formal crop improvement, as well as often being genetically diverse, locally adapted and associated with traditional farming systems” (Camacho Villa, Maxted, Scholten, & Ford-Lloyd, 2005, p. 373).

² The Levant is considered to be part of southwestern Asia; it ranges from the southern borders of the Taurus Mountains in Turkey into the Sinai Peninsula. Its eastern border comprises the Middle Euphrates Valley, Palmyra basin, Gebel ed-Druz, and Azraq, as well as the El-Jafr basins (Bar-Yosef & Belfer-Cohen, 1989).

and farmers' livelihoods.

The sustainability of a certain product is assessed using three main criteria: environmental, social, and economic sustainability (Ohlsson, 2014). The social aspect of sustainable production addresses human rights, access to assets, and working conditions. The economic aspect considers a sustainable return on investment. Lastly, the environmental aspect involves the contribution to climate change and loss of diversity (Ohlsson, 2014). For the purpose of assessing the sustainability of wheat production in West Bekaa, this study examines the cultivated wheat varieties, production systems, and cultural practices adopted by farmers that affect environmental health. Additionally, this study explores the land tenure systems, marketing strategies, and socio-economic factors reflecting the socio-economic status of farmers who play a significant role in ensuring wheat sustainability. Finally, the study examines wheat by-products to highlight the importance of sustaining wheat for the conservation of Lebanese culinary heritage.

Wheat Production

Wheat is a dominant staple grain, providing up to one third of the calories consumed in the Middle East and North Africa (MENA) region (World Bank, 2009). Although this region is the largest net importer of wheat in the world, wheat is the largest field crop by area in the region by far and is currently cultivated on about 26 million hectares (64 million acres) (Ahmed, Hamrick, Guinn, Abdulsamad, & Gereffi, 2013; Nigatu & Motamed, 2015). This area is expected to increase by about 0.4% annually through 2024 (Nigatu & Motamed, 2015).

Wheat plays an important role in the Lebanese diet and is used, depending on the variety, to make different types of *borghol* (cracked wheat), *kishk* (cracked wheat fermented in yogurt), and flour (for *saj* bread). The total yearly consumption of wheat in Lebanon ranges between 400,000 to 450,000 tons (Harrigan, 2014), of which only about 130,000 tons are locally produced, and the rest imported (Food and Agriculture Organization of the United Nations [FAO], 2018). The region of Bekaa (Central and West) yields the highest production of

wheat (44% of the national total), followed by Baalbeck and Hermel (14%). Zero percent of production is reported in Mount Lebanon (Ministry of Agriculture [MoA] & FAO, 2012). Farmers identify landraces of wheat morphologically and by their culinary use. Farmers typically give these landraces local names that differ between regions. However, no research has investigated the in-situ preservation of wheat landraces and related it to the sustainability of the wheat production value chain.

On the basis of the above-mentioned lack of research, this research analyzes the production value chain of the locally produced wheat and its sustainability.

Methodology

This research surveys and evaluates wheat production and processing in West Bekaa. The methodology relies on the value chain analysis (Hellin & Meijer, 2006; Tohmé Tawk, Moussa, Hamadeh, & Abi Saïid, 2011; Tohmé Tawk, Abi Saïid, & Hamadeh, 2014) of wheat production, which includes a description of the agricultural practices used, the wheat varieties grown, and the marketing channels used by farmers. This value chain analysis reveals different constraints and opportunities in the production system, resulting in the assessment of its sustainability. Wheat varieties were identified based on the local terminology. However, it is worth noting that these varietal names might differ from one region to another and are not accurate indicators of the varieties; only DNA tests, which were not within the scope of this study, can help when comparing varieties.

Survey Procedure

A survey was conducted during the summer of 2014 in the West Bekaa, a region known for wheat farming and processing of wheat by-products. A semistructured questionnaire that asked both open-ended and closed-ended questions was developed and comprised sections: (1) Screening questions, (2) Questions of adopted farming practices and farmer's knowledge, (3) Questions on the social sustainability, (4) Economic sustainability, (5) Socio-demographic questions, and (6) Wheat by-products. The questions related to the sustainability of wheat were adapted from the sustainability

indicators of the French model IDEA, Indicateur de Durabilité des Exploitations Agricoles (Zahm, Viaux, Vilain, Girardin, & Mouchet, 2008).

A total of 63 farmers from the West Bekaa were interviewed. All producers were selected by means of snowball or chain sampling since they are sparsely distributed in the regions and no official registers are available for them to provide a sampling framework. It was difficult to achieve an accurate representative sample in the absence of any statistical data; however, respondents were selected in a way to achieve broad geographical coverage of the targeted region in order to avoid any selectivity bias. Wheat producers representing small and large-scale farms, ranging between 2 and 3000 dunums (0.2–300 ha or 0.5–740 acres), were selected with the help of local key informants. Out of the 63 respondents, 54 answered the tenancy question on whether they own or rent the land. Therefore, the nine who did not answer this question were dropped from the final sample used for analysis because this tenure data was essential to understand the wheat value chain. Collected quantitative and qualitative data were analyzed using STATA version 12.

Results

The survey's results reveal that wheat is still a crop commonly planted in the West Bekaa on farms between 0.2 and 300 ha (0.5–740 acres) in size.

Environmental Sustainability

Cultivated wheat varieties

The names farmers use for wheat differ among regions and are not accurate indicators of the wheat varieties. Local wheat is specified as Baladi (local), Bekaii (referring to the Bekaa region), Asmar (brown wheat), Salamouneh (having elongated form), Howraneh (referring to the volcanic plateau Hawran in Syria), Ahmar (brown), Biyadi (white). Most traditional by-products—namely *bulgur*, *kishk*, and flour for traditional *saj* flat bread—are produced using these local varieties. Durum wheat (*kasi*) and soft wheat (*tareh*) are also planted.

Farmers are offered improved wheat variety seeds from the Lebanese Agricultural Research

Institute (LARI) at subsidized prices (LARI & MoA, 2014). Based on the survey, 55% of producers in West Bekaa get their wheat seeds from LARI; the others buy their seeds from commercial agricultural suppliers in the area. The main varieties available at LARI (used by 18 producers) are called Miki, Lahen 2, and Lahen 3 (LARI & MoA, 2014), and Masara, introduced in 2000. Farmers also mentioned other names of wheat varieties provided by LARI: Saragolla and Italian. The varieties bought from commercial suppliers are Shem 1, Shem 2, and Shem 3. All producers mentioned that the hybrid varieties from LARI and commercial suppliers have higher yields than landraces and that landraces are rarely used due to their low yield.

Wheat production

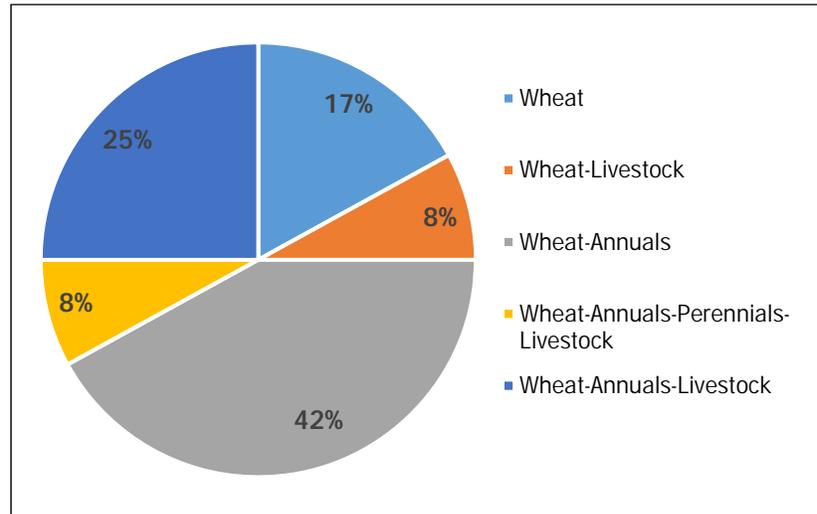
Wheat production systems. As defined by Madry et al. (2013), homogeneous farms are classified as one group or type of farm, representing a single farming or production system. In order to identify the different wheat-based production farms, we developed a typology based on selected criteria related to the crop sequence and the integration of other agricultural activities, such as crops and animal production. Five wheat-based production systems were identified:

1. **Wheat-fallow** (17%): Wheat monoculture system where only wheat is produced, and the land is kept fallow after harvest;
2. **Rotation of wheat and annuals** (42%): This is the prevailing system where wheat production is part of a crop rotation involving other annual crops, mainly chickpeas, potato, and other vegetables (tomato, cucumber, pepper, zucchini, etc.);
3. **Integrated wheat-livestock systems** (8%): Integrated livestock-wheat production system where only wheat is grown on the land and livestock production, mainly cow and/or small ruminants, is integrated with it;
4. **Integrated crop-livestock systems** (33%) including 2 subsystems:
 - a. **Rotation of wheat with annuals combined with animal production** (25%): Integrated crop-livestock system where wheat is combined with other annual

crops, such as pulses or vegetables and animal production;

- b. **Rotation of wheat with annuals combined with perennial crops and animal production (8%):** Integrated crop-livestock system where wheat is combined with annuals and orchards (fruit trees such as olives, apples, almonds, and vineyards), as well as animal production.

Figure 1. Wheat-based Production Systems in the West Bekaa



Wheat production combined with animal production (Types 3 and 4) represents 41% of the sample in West Bekaa (Figure 1). Sheep and goat herds of the West Bekaa leave the mountain rangelands by mid-summer and migrate toward the plain to feed on crop residues (wheat and vegetables). Farmers who do not own animals lease their land to shepherds for an average fee of 3000 LBP/dn (about US\$2/0.1 ha) (US\$1=1,500 LBP; 1 dn [dunum]=0.1 hectare=0.25 acre) of wheat residues and 6000 LBP/dn (about US\$4/0.1 ha) of vegetable residues. From this arrangement, producers benefit from the organic matter left in the form of animal manure, which improves soil fertility. These results show the close links between wheat production and animal-keeping, thereby contributing to each other's sustainability.

According to the results we obtained, the average area of wheat cultivation is 297 dn (30 ha or 73 acres) ranging between as low as 2 dn (0.2 ha or 0.5 acre) up to 3000 dn (300 ha or acres 740 acres).

The average wheat yield is 458 kg/dn (4580 kg/ha or 4,076 lbs./acre), ranging between 100 kg/dn (1000 kg/ha or 890 lbs./acre) and 800 kg/dn (8000 kg/ha or 7,120 lbs./acre), exceeding the average of 300 kg/dn (3000 kg/ha or 2,670 lbs./acre) reported in the latest national census (MOA & FAO, 2012).

Cultural practices. Sixty-two percent of the farmers irrigate once or twice and the rest irrigate 3 or 4 times. The plowing frequency varies between 1 and 3 times, depending on soil quality and the production system. Ninety-two percent of the farmers apply herbicides once per season; the remaining 8% do not apply herbicide. Farmers apply urea (43% nitrogen) once, at a rate of minimum 12 kg/dn (120 kg/ha or 107 lbs./acre) to maximum 80 kg/dn (800 kg/ha or 712 lbs./acre) (33.6 kg of net N/dn/season [336 kg of net N/ha/season or 299 lbs. of net N/acre/season]). Fifty-nine percent

Table 1. Wheat Producers vs. Land Tenure and Land Dedicated to Wheat Production

Land Tenure	Land dedicated to wheat production (%)							
	Part of the land		All of the land		Do not follow the same system every year		Total	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Owner	7	35	1	3	5	83	13	24
Tenant	13	65	24	86	1	17	38	70
Owner-Tenant	0	0	3	11	0	0	3	6
Total	20	100	28	100	6	100	54	100

Table 2. Land Tenure Versus Cropping System

Land Tenure	Cropping System							
	Wheat-fallow		Wheat-annuals		Integrated crop system (wheat; annual; animal)		Total	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
At least part-owner	0	0	3	15	8	40	11	23
Tenant	8	100	17	85	12	60	37	77
Total	8	100	20	100	20	100	48	100

Fisher's exact test p value is 0.000.

Table 3. Type of Marketing Channels Versus Land Tenure

Type of market	Land Tenure							
	Owner		Tenant		Owner-Tenant		Total	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Sold to state	2	29	29	88	2	67	33	77
Direct sales	1	14	0	0	1	33	2	5
Sales through a dealer	4	57	4	12	0	0	8	18
Total	7	100	33	100	3	100	43	100

Table 4. Type of Marketing Channels Versus Mean Cultivated Area in Dunums

Type of market	Mean (cultivated area in dn ha acre)
Sold to state	375 37.5 93
Direct sales	205 20.5 51
Sales through a dealer	148 14.8 37

of the producers do not use pesticides, whereas the remaining 41% spray 1 to 2 applications, which is not intensive compared to the amount used for vegetable production. In addition, 95% of producers do not apply manure.

Socio-Economic Sustainability

Land tenure systems

In the West Bekaa, most of the wheat producers are tenants (70%), and almost 86% of those produce only wheat on the land. Owners represent 24% of producers and tend to grow wheat on just part of their land. Based on the survey results, the remaining land is cultivated with perennial crops such as fruit trees (cherries, apples, grapes, olives, and almonds). Few producers (6%) are tenants and owners simultaneously and tend to cultivate only

wheat. Owner-tenants are farmers who own part of their tended land and rent additional land. In addition, 6 producers reported that they do not follow a regular system every year (Table 1). Land tenure is not significantly correlated with the size of the farm.

A Fisher's exact test looked into the potential relationship between land tenure and cropping system. Farmers that are owners on all or part of their tended lands are grouped into one category, "at least part owner" (Table 2). Results show that integrated crop system farmers (i.e., farmers who combine animal production with wheat and possibly annuals) are significantly less likely to be tenants than either wheat-fallow or wheat-annuals farmers (p value=0.000). This is somewhat expected, as integrated cropping systems are more demanding in terms of investment and have potentially longer return periods than either of the other two systems; therefore, they would require more secure access to land. The results come from 48 respondents, as 6 out of 54 did not answer this question.

Marketing strategies

Most wheat growers (94%) produce wheat for

Table 5. Number of Household Income Earning Members and Agriculture as Only Source of Revenue

Agriculture as the only source of revenue	Number of income-earning household members						Total	
	1 member		2 members		3 or more		Frequency	%
	Frequency	%	Frequency	%	Frequency	%		
Yes	7	37	2	14	1	11	10	24
No	12	63	12	86	8	89	32	76
Total	19	100	14	100	9	100	42	100

Fisher's exact test p value is 0.258

Table 6. Agriculture as the Only Source of Revenue With Respect to Total Surface of Area Cultivated

Agriculture as the only source of revenue	Frequency	Total Surface Area cultivated (Mean) (dn)	Standard deviation
Yes	12	169.1	197.1
No	35	348.8	709.9

Wilcoxon rank-sum test p value is 0.48

commercial purposes. Almost half market more than 50% of the yield, while the other half sells their entire yield. The marketing channels vary according to the land tenure system adopted by the farmer (Table 3) whereby tenants tend to sell to the state more than to owners. The results are from 43 respondents, as 11 out of 54 did not answer this question.

Moreover, when looking at the type of marketing versus the mean cultivated area, we found that the producers with the largest areas tend to sell to the state (Table 4). This is likely because the payment is delayed for few months after the harvest, and only large-scale or well-capitalized farmers can sustain themselves without relying on immediate cash. Hence, small-scale farmers tend to sell to dealers or traders at lower prices (sometimes at only a third of the state price) in order to receive payment quickly and before the quality of the product deteriorates.

In addition, most farmers are not organized in cooperatives. Only 15% are members of an agricultural cooperative, and not necessarily a wheat production cooperative.

Socio-economic Factors

Age. Our results show that the majority of farmers are older than 40 years of age: 52% are older than

60, 40% are between 40 and 59 years of age, and only 8% are younger than 40.

Agriculture as the only source of revenue.

Twenty-four percent of interviewed wheat producers rely on agriculture as

their only source of revenue. The contribution of family members to the household income (Table 5) reveals that when the farmer (head of the family) specializes in agriculture, there are fewer household members involved in other economic activities. However, Fisher's exact test returns a p value of 0.258, indicating that the above trend is not significant. Note that these results pertain to 42 respondents out of 54 for either of the two questions "number of household members" and "agriculture as the only source of revenue" as the nonrespondents may have judged the information to be personal and confidential.

Furthermore, we looked at how agriculture as the only source of income relates to the total surface area cultivated by the farmer. Table 6 shows that, on average, a farmer who relies solely on agriculture for income cultivates a smaller surface area than a farmer who does not. One can speculate that full-time farmers as a category tend to be smaller. This said, a two-sample Wilcoxon rank-sum (Mann-Whitney) test indicates that the difference between the two average surface areas is not significant ($p=0.48$).

Subsidy. The government of Lebanon assists local wheat farmers in the form of subsidies. The subsidy is handled by the General Directorate of

Cereals and Sugar Beet Subsidy (GDCS), which is under the jurisdiction of the Ministry of Economy and Trade. According to the GDCs, “The subsidy was designed to shield farmers from the fluctuations of international wheat prices” (Blominvest Bank, 2016, p. 5). The GDCS purchases the wheat from the farmers at a set price and then sells it at international market prices.

When producers were asked whether they would continue cultivating wheat if the government no longer subsidized the wheat production in Lebanon, about 42% of them answered that they might or definitely would stop growing wheat. Among all producers, only 9% responded that they would “definitely continue” growing it, and 17% answered that they would “maybe continue” growing it (Table 7).

For the majority of surveyed farmers (75%), wheat is planted is mainly for rotation purposes to rest the land. This means that wheat production is rotated with annuals and may also involve animal production. This is encouraged by the subsidy that compensates for part of the production cost.

By-products of wheat

Wheat by-products include bulgur and kishk. Bulgur is dry cracked wheat and is a traditional product heavily used in the Lebanese diet. Kishk is a traditional dairy product prepared with bulgur fermented in milk or yogurt. Among the wheat producers from the West Bekaa, 51% do not process their wheat, while the remaining 49% transform it into kishk alone or bulgur alone, or both kishk and bulgur (60%, 10%, and 30%, respectively).

Women are mainly involved in food processing activities rather than wheat production activities. In fact, nearly all of the surveyed wheat producers are males (98%). However, females are involved in kishk processing.

Bulgur production

Our results show that bulgur is either purchased from mills or produced at the household level. Most of the processors used similar practices in the

Table 7. Decision Taken by Producers for Growing Wheat if Subsidy Is Stopped

Decision of producer	Frequency	%
Definitely continue growing	4	9
May continue growing	7	17
Hope will be able to continue growing	11	26
Might stop growing	9	21
Will definitely stop growing	9	21
Will try growing in a year	2	4
Don't know	1	2
Total	43	100

processing of bulgur. Of the producers, 69% process bulgur indoors, while the rest process it outdoors. Most of the producers (83%) market less than 50% of their total bulgur and retain the rest for home consumption, as bulgur is a main ingredient in the traditional Lebanese cuisine.

Kishk production

Kishk is mainly produced by women. Kishk production is a major constituent of household traditional food preservation and diet. It is a traditional, artisanal product and is a family activity carried out at the household level and led by women. None of the producers is 100% commercial, since kishk is a traditional preserve for home consumption. Based on our data, the average production of kishk ranges between 5 to 500 kg (11 to 1,102 lbs.) per year per producer or group of producers.

Discussion

Environmental Sustainability

Wheat varieties

The current study reveals the strong dependence of wheat farmers on improved wheat varieties. None of the identified farmers reported using local landraces. Further investigation and research are needed to identify producers using landraces, the origin of these seeds, and the reasons for continued use. Conserving the diversity of wild relatives has become a priority for promoting food security in the face of the devastating impacts of climate change. Crop wild relatives are adapted to a diverse

range of habitats and hold genetically important traits, such as biotic and abiotic stress resistance, and thus able to enhance yield and production stability (FAO, 2008; Guarino & Lobell, 2011; Maxted, Ford-Lloyd, Jury, Kell, & Scholten., 2006; Vollbrecht & Sigmon, 2005). Therefore, conserving wheat landraces is vital for the enhancement and stability of wheat production. Wheat landraces—considered a reservoir of genes that plant breeders need in their wheat improvement programs—could be conserved through both *ex situ* and *in situ* preservation methods.³ Although *ex situ* holds potential for safeguarding genetic resources, it must be complemented by *in situ* conservation that maintains the evolutionary dynamics of the wild varieties (Esquinas-Alcázar, 2005). Acknowledging the roles of peasants, farmers, pastoralists, and their traditional knowledge is vital for conserving agrobiodiversity. In addition, if farmers lose access to their wild crop relatives, they lose control over their heritage, as well as have reduced potential for benefiting from sustainable and highly productive agricultural practices, which are both a cause and a consequence of biodiversity (Grain, 1996). Therefore, considering *in-situ* preservation would ensure the conservation of precious genetic resources for future generations.

Few projects have been implemented to support *in-situ* conservation and sustainable use of biodiversity in Lebanon. Most studies follow the community-based approach and work with local communities, farmers, and NGOs with a focus on crops of global significance for food and agriculture (Tohmé Tawk et al., 2014). Assi (2005) conducted agro-ecological and eco-geographic studies, as well as socio-economic, indigenous knowledge, and botanical surveys in some rural villages and found the presence of several wild relatives of wheat, such as *Aegilops spp.*, *Triticum dicoccoides*, *T. urartu*, and *T. boeoticum* species in two sites in the Bekaa Valley, Ham and Maarabon. These wild species are the ancestors of the currently used local landraces of durum wheat such as *Hourani*, *Bekaii*, *Salamouni*, *Douchani*, and *Nabeljamal*. However, as revealed by farmers in the current study, the hybrid

varieties from LARI and commercial suppliers have higher yields than landraces, which are rarely used due to their low yield. Therefore, providing the right incentives for planting and conserving wheat landraces and considering *in-situ* conservation of wild crop varieties as a national priority hold significant potential for managing agrobiodiversity, preserving Lebanese cultural heritage, and enhancing food security.

Wheat production systems

The current study reveals the close interaction between wheat production and animal husbandry, in which 41% of the farmers integrate the two production systems. According to the IDEA method, production systems combining crops and livestock are more sustainable than other systems (Zahm et al., 2008). A sustainable agricultural production system must address five main factors: (1) supplying consumers' needs, (2) preserving the environment through the stewardship of resources such as land and water, (3) using on-farm resources efficiently, (4) sustaining the economic viability of farmers, and (5) improving the quality of life for producers and society (Sassenrath et al., 2009; Walters et al., 2016). Integrated agricultural production techniques are one way to accomplish these sustainability goals. The integrated production system combines crop and livestock inputs and outputs to promote environmentally beneficial farming practices (Boller et al., 2004; Hendrickson, Hanson, Tanaka, & Sassenrath, 2008). In addition, it minimizes farmers' risks by diversifying activities, hence permitting farmers to expand their marketing channels (Hendrickson et al., 2008).

Cultural practices

Agrochemical use is common among wheat farmers (92% apply herbicides and 41% apply other pesticides). Agrochemicals, while applied to enhance crop yields and protect crops from pests, also increase the costs of food production and cause serious undesired side effects, including environmental contamination and health problems (Carvalho, 2006).

³ *Ex situ* refers to the conservation of genetic resources off-site, such as in gene banks. *In situ* refers to the conservation of genetic resources in the wild and on farms, and it is often associated with traditional subsistence agriculture (Altieri & Merrick, 1988).

On the other hand, manure plays an important role in crop production and soil improvement. It promotes microbiological activities and phosphorus cycling in the soil, as well as reduces runoffs and decreases soil loss (Gilley & Risse, 2000; Parham, Deng, Raun, & Johnson, 2002). Yet only 5% of surveyed wheat farmers apply manure.

All wheat farmers plow their fields, and some even practice excessive plowing. However, the no-till agricultural approach has been proven very efficient in minimizing soil and crop residue disturbance, minimizing erosion losses, controlling soil evaporation, sequestering carbon in soil, and reducing energy needs (Lal, Reicosky, & Hanson, 2007). Soil management is vital for the sustainability of production systems.

Among the drivers that affect production systems and cultural practices is knowledge. In Lebanon, farmers lack access to effective extension services (Qamar, 2012). Access to knowledge would be vital to reducing the application of agrochemicals and promoting organic farming, both of which would be promising for environmental and public health. Knowledge management and sharing as well as adequate extension services in Lebanon can effectively enhance the efficiencies of the farmers' agricultural production systems and sustain local wheat production.

Socio-Economic Sustainability

Land tenure systems

Land tenure plays a vital role in farmers' livelihoods and livelihood strategies because the size of holdings shapes resource use and its allocative efficiency. Ownership additionally shapes land-based power in the society, the distribution of material wealth and income, and the right to transfer property (Sadr, 1972).

Land tenure systems in Lebanon have not benefitted the majority of farmers since 19th-century Ottoman rule, followed by the French mandatory powers. Since then, collective ownership was suppressed, often at the behest of real estate interests. This then facilitated mortgage lending by marketing the land and making it a real commercial commodity that is officially sold and licensed, hence allowing individuals and foreign companies to freely

trade land. As soon as the collective types of ownership and semi-nomadic farms vanished, cultivators were exposed to excessive risks and resorted to borrowing, in which they lacked any guarantee or security of tenure (Daher, 1974; Sadr, 1972). In addition, as governments invariably aim to ensure participation of agriculture in the global trade and economy, the result has been the concentration of land ownership with national or foreign capital in the most productive areas. These areas are subject to more mechanized, irrigated, and specialized forms of production, open to long value chains, and driven by exports and large-scale distribution. This has resulted in further fragmentation of smaller holdings and the emergence of landless farmers (Bush, 2016). Today, big landowners, representing only 2% of this sector, control over 30% of agricultural land. However, small farmers, who represent over 95%, occupy only half the agricultural area (Zurayk, 2012a). This is reflected in the current study, where only 24% of surveyed farmers own land. In addition, tenants, lacking security over land, are more likely to adopt monoculture production (85% of surveyed tenants produce wheat on all their land) while owners, representing 16% of producers, tend to grow integrated wheat with other perennial crops (see Table 1). Offering farmers guarantee over land tenure would permit them to invest in sustainable production systems.

Marketing

The GDSC in Lebanon purchases wheat produced by local farmers at a guaranteed price and sells it at international market prices to the 13 mills operating in the country (Ministry of Finance [MoF] & United Nations Development Programme [UNDP], 2012). However, as this study reveals, not all farmers sell their wheat to the directorate, despite the encouraging prices, and prefer to sell directly in the market to avoid the bureaucratic procedures and delay in payments by the government. Therefore, poor farmers who lack capital and cannot sustain themselves without relying on immediate cash do not have many marketing choices other than selling at low prices to dealers or traders who end up receiving the highest share of production.

Moreover, farmers are not organized in

cooperatives; the farming sector in Lebanon lacks substantial cooperatives (Markou & Starvi, 2005). This prevents farmers from gaining leverage in purchasing inputs and marketing their products. Cooperatives can play a vital role in supporting farmers' production and marketing strategies.

Socio-economic factors

Farming as a profession has become dominated by the aging; farmers around the world are aged between 50 to 60 years old on average (Global Forum on Agricultural Research [GFAR], 2016). This was reflected in this study, where 90% of surveyed wheat farmers are above 40 years old. Farming needs a change in image to attract young people. Young people must understand the value of farming and must be encouraged to become the future of agriculture (GFAR, 2016; Vargas-Lundius, 2011).

Disguised under the façade of food security and modernization, policies undertaken in the MENA region in general have tended to ignore local rural conditions of poor people, especially farmers, landless people, and females, hence challenging rural well-being. Moreover, farmers' voices have always been absent from the family farming debate and the policies shaping agriculture and food security (Bush, 2016). In addition, protecting local agricultural production in Lebanon through quotas, tariffs, licensing procedures, etc., has been restrained because of Lebanon's participation in all international treaties and organizations advocating free trade (Markou & Starvi, 2005). Lebanese farmers as a result have been trapped in poverty.

The Lebanese government has been trying to promote farmers' activities by subsidizing loans and subsidizing specific agricultural products such as wheat. The extent of wheat producers' dependence on government subsidies is affected by international markets and climatic conditions. In 2007 and 2008, for instance, when the price of wheat on the international market was high enough that the farmers sold their entire production directly to the market, no subsidy was made by the treasury to the General Directorate of Cereal and Sugar Beet (GDSC) (MoF & UNDP, 2012) leading to a decrease in the number of farmers who benefited. However, in 2010, poor climatic conditions and

floods affecting wheat yields, especially in the Bekaa region, were a major factor in decreasing the national wheat production. This put farmers in more need of government support than ever. Therefore, government support is vital, especially since wheat is a sensitive product, highly affected by international markets and climate change. The importance of government support for the sustainability of wheat production is revealed in this study, where only 8.5% of the producers said they would continue growing wheat if the government were to refrain from subsidizing wheat production.

However, such subsidies are not enough to secure farmers' livelihoods and sustain the Lebanese farming sector. This is clearly reflected in the current study by the large number of farmers specializing in agriculture, complemented by a large number of their family members involved in off-farm activities (Table 3). Wheat production in particular, and the agricultural sector in general, are under threat in Lebanon; ensuring their sustainability requires action.

Promoting farmers—especially the poorest small-scale producers who face extensive threats and are trapped in poverty—is a prerequisite for ensuring agricultural sustainability. Farming in Lebanon could be supported by targeted policies addressing small producers, farmers, workers, and local society. The *laissez-faire* economy of Lebanon, which has been deployed since the independence, has been shaping agrarian change and imposing serious challenges to farmers, and has been exacerbated by the lack of policies securing their livelihood strategies (Zurayk, 2012a). Farmers would benefit greatly from policies focusing on (1) access to resources; (2) organization of the farming sector, allowing farmers to gain a substantial portion of added value; and (3) collective organization of small-scale family farmers through associations, cooperatives, and informal groups. Together these policies would support the farmers' access to economies of scale for some of their activities as well as their participation in social and political dialogue (Bush, 2016). In addition, enhancing the social policies would offer small-scale farmers more security and empowerment. Such policies would include protecting farmers, including the right to retirement for old farmers (both men and women) and

their access to quality education and healthcare, as well as provision for value systems (e.g., child labor, gender equality, access to cultural services). Regional rural development policies including the emergence of secondary towns, roads, social and cultural infrastructure in rural areas, and safety for people and property would also promote rural and cultural sustainability.

By-products of Wheat

Among the surveyed wheat producers from the West Bekaa, 49% process their wheat into either kishk alone, bulgur alone, or both kishk and bulgur. Bulgur and kishk are produced mainly for home consumption, which indicates that these production chains can, or are, playing a role in food security and income-generating activities. These products are traditional food reflecting culture and history, but their conservation has been threatened by commercially produced products (Chedid, Tawk, Chalak, Karam, & Hamadeh, 2018). Chedid et al. (2018) investigate the production chain of traditional kishk in the West Bekaa, revealing that kishk production has not been affected by the changes that have occurred in the wheat sector, including the introduction of new wheat varieties. Replacing the traditional wheat landraces with improved hybrid varieties might deprive these traditional products of their original identity and added value. Thus wheat sustainability is essential for sustaining Lebanese culinary heritage. More attention should be given to the analysis and conservation of these traditional foods.

Sustainability of Wheat Production

Agricultural production, especially of cereals, faces significant constraints in the MENA region (Al Masah Capital Limited, 2012) due to a shortage of arable land (less than 4%) and water, and unfavorable weather conditions in many countries. MENA is considered one of the most water-scarce regions in the world, having an average water availability of 1,200 m³ (42,400 ft³)/person/year in comparison to a global average of about 7,000 to 10,000 m³ (247,000 ft³ to 353,000 ft³)/person/year (Siddiqui & Anandon, 2011; World Bank, 2006). In addition, the regional average is estimated to drop to about 500 m³ (17,700 ft³) per person by 2025 (Siddiqui &

Anandon, 2011). In Central and West Bekaa, 50% of the planted wheat area is irrigated. Farmers usually irrigate wheat 2 to 3 times per season to supplement rain shortage during the spring (April–May). In 2005, 143,700 tons of wheat were produced on 49,500 ha (122,300 acres); this production increased to 150,000 tons (over 38,000 ha [93,900 acres] of land) in 2012 to dropped to 140,000 tons on 37,000 ha (91,400 acres) in 2013 (Ministry of Environment, 2011). Therefore, wheat yield did not change in relation to the cultivated land surface, as the highest yields of 2012 were not obtained from the largest surface, and the wheat productivity changed from 2.9 t/ha (1.2 t/acre) to 3.95 t/ha (1.6 t/acre) to 3.58 t/ha (1.45 t/acre). Instead, this could be due to rain instability, supplemental irrigation, and even fluctuating temperatures (maxima and minima), as they seriously affect wheat yields. Therefore, the exacerbation of climate change, which is already felt and will be further felt in the future with increasing temperatures and fluctuating rainfalls, will influence wheat production in Lebanon and requires active strategies, focusing on mitigating water shortages, improving storage, diversifying the supply, and regulating usage (Ahmed et al., 2013).

In addition to their main role in promoting rural livelihoods, agricultural landscapes play a vital role as habitat for biodiversity and natural resources, especially landscapes managed by small-scale farmers promoting ecofriendly agricultural practices (Lockie & Carpenter, 2010). However, agriculture in Lebanon is facing numerous economic, demographic, and climatic challenges, resulting in a loss of resources, structures, and assets. A high population growth rate—the highest in the region (6%)—is imposing serious urbanization in Lebanon, thereby decreasing the limited agricultural land due to expanding cities (UN Data, 2017). Urban centers in Lebanon traditionally have been built strategically near water resources and fertile lands. But as the population expanded, more land was used for residential areas and less land has remained for farming (Zurayk, 2012a). In addition, considerable emigration has been occurring due to internal and external conflicts since the 19th century, and rural-to-urban migration has been a strong social force within Lebanon. Peasants have

moved to the cities to pursue improved living conditions or to escape the horrors of war and poverty (Abu Khalil, 1989). These demographic shifts have resulted in a reduction in farming and a transformation of the production patterns and agricultural and rural landscapes. Supporting farmers—especially small-scale farmers, who are the stewards of the land and natural resources—is important in order to sustain traditional farming practices and preserve the cultural landscapes. The Lebanese government, as well as the private sector (e.g., NGOs and research and development institutions), can play a vital role in this respect. Access to finance, markets, and knowledge must be promoted for wheat farmers to support the traditional production of wheat and its by-products.

In addition, food and landscape are very closely interrelated and represent the two sides of a heritage (Zurayk, 2012a; Zurayk, 2012b); if one of these two is subject to change, the second is affected. Concurrently, according to Muchnik and De Sainte Marie (2010), the landscape evolves with the diet and eating habits of people, and the demand for traditional and local food production can have a positive impact on landscape and agrobiodiversity. On the contrary, however, an increased demand for processed and imported food can have damaging effects on preserving landscape and agrobiodiversity. Therefore, in addition to supporting farmers, influencing consumers plays an important role in preserving wheat production and its traditional by-products.

Conclusion and Recommendations

Wheat is a staple grain in the Lebanese diet and the Levantine breadbasket. This study reveals that integrated production systems in West Bekaa are adopted by a considerable number of farmers, and such systems hold substantial potential for sustainability. Wheat production in particular, and the agricultural sector in general, are under serious threat. The important challenges faced by farmers are revealed in this study. Farmers in West Bekaa are highly dependent on improved wheat varieties and have abandoned landraces. They have been suffering from a lack of tenure security, where most wheat producers are tenants in a country characterized by a *laissez-faire* agricultural policy

that constrains their agricultural development and innovation. In addition, they lack access to substantial cooperatives, hindering their marketing strategies. The future of wheat production in Lebanon is critically threatened since wheat farmers are an aging demographic and most wheat farmers rely on government subsidies. In order to promote the sustainability of wheat production in Lebanon, further investigation and research are needed to identify producers using landraces because conserving landraces is vital for retaining agrobiodiversity and promoting food security. In addition, wheat landraces are important for the sustainability of original identity and the added value of their by-products, *kishk* and *bulgur*. Being an essential raw material for different traditional products, sustaining wheat is crucial for sustaining Lebanese culinary heritage. Certification and quality control could play an important role in this respect, such as by urging producers to use wheat landraces in the production of these by-products. The promotion of cooperatives would result in organizing and linking farmers to producers, hence also increasing the demand for local wheat varieties.

More attention should be given to analyzing and conserving these traditional foods. Giving farmers the right incentives for planting and conserving wheat landraces from the Levant, where they originated, and preserving buffer zones for wild crop relatives holds significant potential in this respect. Knowledge management, knowledge sharing, and extension services could effectively promote sustainability in agriculture, and offering farmers security over land tenure would permit them to invest in sustainable production systems. Moreover, developing strong cooperatives would aid farmers in purchasing inputs and marketing their products. Spreading awareness of the benefits of local food systems and the challenges that wheat farmers face would encourage consumers to eat locally produced food. In addition, supporting Lebanese culinary heritage through tourism and other cultural activities would aid in sustaining traditional products, such as the traditional *kishk* and *bulgur*.

Threatened by climate change, wheat production sustainability requires specific strategies that focus on mitigating water shortages and improving

its storage, supply diversification, and regulation. Developing policies to support farmers, their production, and their livelihoods holds great potential for sustaining the entire farming sector in general and wheat production in particular. In order to target such specific policies in a specific context, it would be very valuable and beneficial to conduct comprehensive studies and collect information on the diversity of small-scale family farms, their sources of income, their performance, and their livelihood strategies (Bush, 2016). The current study manifests a first step in assessing the state of

wheat farmers in the West Bekaa. Further studies are recommended to encompass all wheat farmers across Lebanon. 

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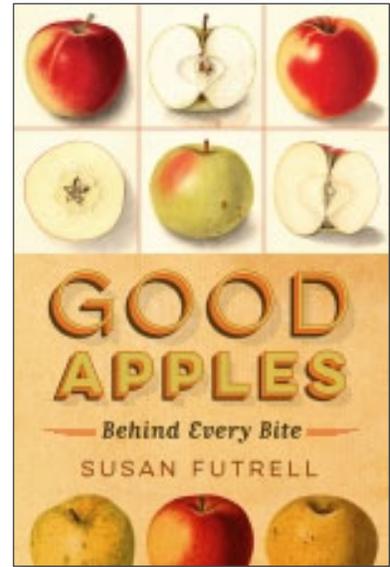
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Finding a middle way to sustainable food systems

Review by Danielle Robinson *
 University of Guelph

Review of *Good Apples: Behind Every Bite*, by Susan Futrell. (2017). Published by University of Iowa Press. Available as paperback and ebook; 262 pages. Publisher's website: <https://www.uiowa.edu/books/9781609384821/good-apples>



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The premise of Susan Futrell's *Good Apples: Behind Every Bite* is that by understanding the environmental, social, and economic issues affecting apples growers in America, the reader can better appreciate and support sustainable food systems. Futrell's storytelling is grounded in her years of experience working in sustainable food distribution, which includes 25 years in sales and marketing for a cooperatively owned natural food distributor called Blooming Prairie Warehouse in the Midwest, and her current work with Red Tomato, a small nonprofit food hub based in

Massachusetts, where she helped develop the Eco Apple® program.

From the beginning, Futrell resists the pressure to simplify and dichotomize complexities. Chapter 1, *At the Intersection of Apples and Local*, establishes this tone with her contextual consideration of how the term local is defined. Chapter 2, *Immigrant Apples*, reviews the history of apples in America. In it she discusses key historical figures and the emergence of seedling nurseries, apple varieties, growers' associations, and land-grant institutions.

In Chapter 3, *The People Who Grow the Apples We Eat*, Futrell introduces a diverse cast of apple growers from across the United States: from organic to conventional, from Connecticut to Washington state, and from first-generation to long-established farming families. The stories shared by these small and midsized growers are used throughout the book, along with the work of

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sustainability thinkers like Rachel Carson (1962), Aldo Leopold (1949/1970) and Wendell Berry (1977), contemporary food writers like Michael Pollen (2006), and a variety of agricultural resources.

The fourth chapter, *Making Apples*, explores the myriad decisions involved in planting, pruning, managing pests and disease, harvesting, packing, shipping, and storing apples. The factors affecting these decisions are complex, ranging from geographic suitability to market appeal. Chapter 5, *Grafting Remnants*, serves as transition from the past to the present as the concept of grafting is considered literally and figuratively in relation to how knowledge about apples is passed between generations.

Chapter 6, *Give the People What They Want*, covers how apples are bred to meet consumers' tastes and the need for efficient, predictable yield. As the case of Red Delicious apples demonstrates, this unfortunately has meant progressively redder, firmer, but less flavorful apples. Chapter 7, *Keeping the Farm*, illuminates how agricultural and economic changes have shifted economic and market power away from growers and local markets. These issues and trends are examined further in Chapter 8, *The Enterprise of Apples for Sale*, which discusses how the pressure to cut costs has reduced apple diversity and centralized control. The strategies to deal with the pressure for profitability have centered on "get big, get niche, or get out." In Chapter 9, *Working Apples*, Futrell argues that the treatment of agricultural workers intersects issues of race, economics, and immigration politics. Again, Futrell cautions against the trap of antagonistic dichotomies like farmers versus workers, white versus of color, citizen versus immigrant, but encourages the reader to focus on the common goals like workforce development and farm sustainability.

In chapter 10, *Pests and Public Science*, Futrell treats controversial issues of pest management with a similar curiosity and sensitivity. She describes the history of pesticide use, as well as biological and ecological approaches central to organic and Integrated Pest Management (IPM). Organic and IPM approaches are further explored in Chapter eleven, *Marketing the Ideal*, using the Alar case of the late 1980s that focused media and public attention on

the effects of the daminozide pesticide on children. The case marked a powerful cultural shift and resulted in national organic standards but damaged the relationship between the environmental community and apple farmers. Finally, in her closing chapter, *A Democracy of Apples*, Futrell makes clear her call for a middle way "that might more quickly reduce the most egregious harm and find workable solutions over time for the rest" (p. 199).

Good Apples gives voice to farmers on small and midsized family farms and those who grow, pick, study, buy, and sell apples. Although Futrell emphasizes that "their stories are not quick sounds bites" (p. 16), she has a good ear for memorable, honest quotes and finds the commonalities and themes within diverse experiences. She deals with the intricacies and challenges of growing and selling apples—like the risks of fruit rot and brown marmorated stink bug (BMSB)—but does not shy away from the bigger questions about why this all matters. Issues like climate change, equity, and democracy are larger than apples, the agriculture industry, or any individual country, and so although it is written from an American perspective, this book would appeal to any reader who is concerned "about the kind of ecosystem, economy and values we are creating for ourselves and for the next generation" (p. 220).

Futrell takes an appreciative, nuanced approach and stresses the need to consider both what needs to be changed and what needs to be understood and valued. She advocates reframing food as a public good collectively determined through a democratic process characterized by interdependence, diversity, resilience, and respect for philosophical differences. Apples' historic role could be treated more critically, given that although Henry Ward Beecher called apples "the true democratic fruit" they have also been tools of colonization. This is dramatically exemplified by the consequences of major projects like the Grand Coulee Dam, which provides irrigation for extensive apple orchards in Washington state by having flooded over 20,000 acres (8,100 hectares) of land that Indigenous people lived and hunting on for millennia (Harden, 1996). Working through a democratic process needs to include critical food-systems alternatives. Food sovereignty movements

dedicated to decolonization and Indigenous revitalization (Figuroa-Helland, Thomas, & Aguilera, 2018; Grey & Patel, 2015; Skinner, Martens, Cidro, & Burnett, 2018) and feminist agroecological approaches (Shiva, 2016) could provide important perspective.

Good Apples is a poetic call for collective action that seeks a middle way. Futrell convincingly argues that the future of family orchards and democracy depends on working together. She is “fierce about standing in the middle” (p. 208), where complexity replaces certainty, because neither extreme, giant-scale, industrialized agriculture or microscale local

agriculture can address all the complexities and interconnections. Futrell’s position reflects Meadow’s (2008) advice for living in a world of systems: stay humble, stay a learner, and celebrate complexity. In many ways, the greatest strengths of *Good Apples*—its open-mindedness and optimistic humility—are also its greatest weaknesses since, as Futrell recognizes, appreciative, inquiry-based moderation “doesn’t fundraise as well as the rallying cry of the certain” (p. 196). *Good Apples: Behind Every Bite* manages to be both idealistic and realistic about food systems’ change. That is a paradox I suspect Futrell would appreciate. 

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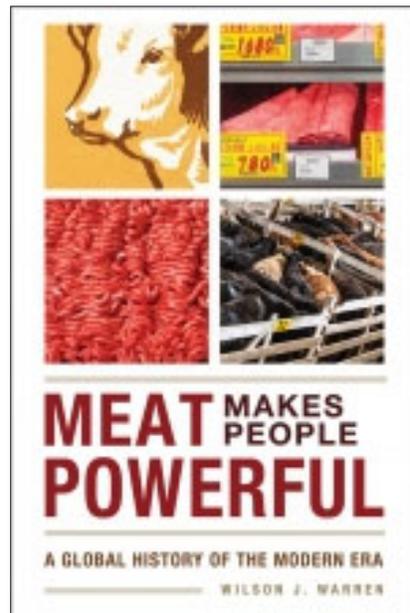
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Why do people eat (so much) meat?— And how can we eat (much) less?

Review by David A. Cleveland *
 University of California, Santa Barbara

Review of *Meat Makes People Powerful: A Global History of the Modern Era*, by Wilson J. Warren. (2018). Published by the University of Iowa Press. Available as paperback and ebook; 264 pages. Publisher’s website:

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Humans eat a lot of meat! According to the Food and Agriculture Organization of the United Nations (FAO), the annual consumption of meat globally in 2013 was 106 lbs. (48 kg) per

capita, up from 56 lbs. (25 kg) in 1961 (FAO, 2018). This amount is projected to increase by between 75% and 145% by 2050 (Godfray et al., 2018), due to the strong correlation between increasing per-capita gross domestic product (GDP) and increasing per-capita meat consumption (Tilman and Clark, 2014). And to provide this meat (along with other animal products), there are about 30 billion livestock animals in the world at any given time—four times the number of humans; over 160 billion livestock are slaughtered annually, half of these poultry (FAO, 2018). No wonder that meat’s impact on our planet and our lives is so large.

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The implied question permeating Wilson Warren’s book is “Why do we eat so much meat?” The title suggests one answer—the belief that *Meat*

Makes People Powerful—and the text makes clear that this is in terms of health, culture, and economics. The final chapters ask a further question—*How can we stop eating so much meat?* They describe the major role that meat is playing in anthropogenic climate change and environmental pollution in general, as well as in the current global noncommunicable disease pandemic. They also discuss the overwhelmingly negative effects of meat consumption on animal welfare and on social equity.

Warren's history of the rapid increase in meat production and consumption in the last two centuries provides an important historical context for exploring answers to these questions. Especially helpful is his comparison throughout of Western meat-culture countries, focusing on the U.S. and western Europe (and, secondarily, countries invaded and colonized by Europeans), with Eastern countries limited-meat-culture countries, focusing on Japan and China.

The book begins with a critique of the dominant explanation for food system change in terms of food regimes, à la Friedmann and McMichael (1989), because it is based on a too-simplistic economic determinism. Warren proposes instead that “political, scientific, and cultural factors well beyond economic issues” (p. 4) are needed to understand the changes in meat production and consumption in recent (19th–21st century) global history—both the rise in consumption and the current evidence of its negative roles in nutrition, the environment, society and animal welfare.

Despite this critique, Warren finds it useful to divide the book into three parts that roughly follow the three historical food regimes: part one, the 19th century (chapters 1–2), part two, the 19th to 20th centuries up to WWII (chapters 3–5), and part three, from WWII to the present (chapters 6–10). The first regime is characterized by Western countries importing grain and meat from their client states; the second regime is characterized by expanding world trade in feed grain and meat dominated by Western nations; the third is characterized by transnational corporations replacing states as the dominant players.

In part one, Warren describes the increasing production and consumption of meat in Western countries with existing meat cultures as a result of

increased affluence, urbanization, transport, and refrigeration and freezing technologies. He argues that these developments allowed the “cultural proclivities” for meat-eating that had already existed in Europe for centuries to be more fully realized.

In contrast, the adherence to Buddhism and Shinto restricted meat consumption in Japan, with the Emperor Tenmu banning beef, horse, and chicken consumption in the 7th century CE. With rising European influence beginning in the 17th century, Western values were embraced, and meat came to be considered necessary for becoming a modern society and for good nutrition. Buddhist beliefs seem to have been co-opted, as temples became frequently located at slaughterhouses to allow ceremonies for the souls of dead animals and for the safety of their slaughterers.

Part two describes the increasing scientific and government support for meat before WWII. Science's main role in promoting meat was to argue for its “foundational role in human diets” (p. 49), especially in providing protein. In Germany, Carl von Voit established the “Voit standard” for protein requirement at 4.2 oz. (118 g) per day (about twice what is now considered optimal), with 50% as animal protein—although we now know animal protein not required. In the U.S., Wilbur Atwater, the experimental nutritionist and inventor of the respiration calorimeter, helped shape federal nutrition policy, especially through his quantification of diet to make feeding the poor “cheaper and easier” via less expensive (salted, canned) meat. There was pushback, however, from those who saw this as elitist and anti-worker, including labor leader Eugene Debs.

In Japan, meat became part of official navy rations as a way to counter beriberi caused by vitamin B1 (thiamine) deficiency. The medical community and government also promoted increased meat consumption to improve the health and strength of the Japanese people, which they believed was needed to avoid racial extermination.

In part three, Warren focuses on the period following WWII to the present, coinciding with the third (neoliberal) food regime characterized by the World Trade Organization (WTO) and “free trade.” This food regime is dominated by transnational corporations that have decimated small-

scale agriculture in countries like Mexico and have seen the U.S. become the dominant feed exporter, instead of the Global South. There have also been major changes in the types of meat consumed. Consumption of poultry meat increased after WWII, as chicken was transformed by public and private research and businesses into “industrial (or technological) chicken” (p. 110). This transformation began in the U.S. and has spread to much of the rest of the world. There also has been a shift of beef from prestige to convenience food, while total consumption has decreased.

Warren also describes the social inequity of the meat system, which is part of a larger food system and social problem. There has traditionally been prejudice against meat workers, and state support in the post-WWII era has not prevented their further marginalization, especially in countries like the U.S., where meat workers have become mostly poorly paid immigrants.

The recent history of meat is increasingly driven by the growing awareness of its negative effects on the environment, human health, animal welfare, and social injustice (Godfray et al., 2018). Warren describes some of these negative effects, including water and air contamination and greenhouse gas emissions from livestock production, and infectious and noncommunicable diseases from meat consumption. Reducing the role of meat in our world has become an existential issue. For example, it is becoming clear that to avoid climate change catastrophe, greatly reduced animal food consumption must be part of our mitigation strategy (Bajželj et al., 2014, Springmann et al., 2018, Willett et al., 2019), and the rise in overweight and obesity, and associated pandemic of diet-related noncommunicable diseases like diabetes, liver disease, heart disease, has huge social

and economic costs (Bloom et al., 2011).

Warren closes by briefly describing various movements to limit meat consumption, including vegetarianism and veganism, as well as efforts to make meat production more sustainable. But the main contribution of *Meat Makes Us Powerful* is the needed insight it provides into the political, economic, and social forces that have shaped the rise of meat consumption—forces that now can help inform how meat consumption might be drastically reduced.

If, as Warren argues, political, scientific and cultural, in addition to economic forces were the key drivers in the rise of meat consumption, how could these same forces serve to do the opposite? There is clearly a role for the state to play in terms of taxes and regulation. The state should also provide education about the negative effects of meat and the positive effects of substituting plant foods, which could contribute to cultural change. If personal economic and supply limitations were a major constraint to meat consumption in the West before the 19th century, could new awareness of global limits to sustainable consumption be a force for reduced consumption? A major obstacle, however, is the economic power of the food industry, which controls so much of our food environment and food information and has a corrupting influence on science (Nestle, 2018). Can our current understanding of meat’s impact on society give new power to arguments from Eastern traditions that call for reduced animal consumption on cultural, religious, and ethical grounds, as well as arguments from Western societies, where leading thinkers have promoted reduced meat consumption for ethical, health, environmental, and social reasons at least since Pythagoras in ancient Greece (Stuart, 2008)? 

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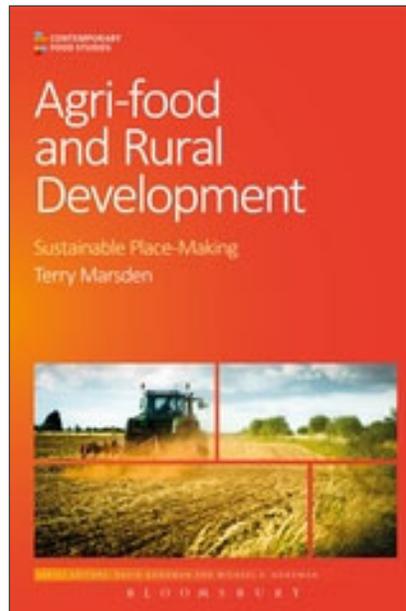
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Contested sustainabilities: The post-carbon future of agri-food, rural development and sustainable place-making

Review by Jennifer Sumner *
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Review of *Agri-food and Rural Development: Sustainable Place-making*, by Terry Marsden. (2017). Published by Bloomsbury. Available as hardcover and paperback; 208 pages. Publisher's website: <https://www.bloomsbury.com/us/agri-food-and-rural-development-9780857857408/>



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Terry Marsden has enormous experience working in the fields of agri-food, rural development, and sustainable place-making. He digs deeply into his experience in this book, looking back over the recent history of food and rural development,

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analyzing current trends in these areas, and looking forward in an age of great uncertainty, both environmental and political, to better understand and promote sustainable food systems.

He begins by positing a significant transition from neoliberalism and production agriculture to a looming choice between what he refers to as the bio-economy and the eco-economy. He describes the former as being “characterized by exogenous development through corporate controlled production of biological products (fuels, mass, technology, enzymes, genomics) for global markets” (p. 92). Backed by the Organization for Economic Cooperation and Development (OECD) and endorsed by the European Union, the bio-economy is the post-carbon offspring of neoliberalism: a little more aware of its shortcomings, but still enmeshed

in a business-as-usual paradigm. In essence, it “incorporates the multiple ways in which rural and urban people and their institutions manage and manipulate the biosphere which sustains their existence and creates economic value out of its non-renewable and renewable resources” (p. 22).

In contrast, he describes the eco-economy as “an alternative and diverse spatial arena for the development of new endogenous production chains and networks” (p. 92). Rather than disrupting and destroying the local and regional ecosystem, the eco-economy is designed to mesh with and enhance it. It consists of “cumulative and nested ‘webs’ of viable businesses and economic activities that utilize the varied and differentiated forms of environmental resources of rural areas in sustainable ways” (p. 66). It follows that the eco-economy does not deplete resources but instead provides net benefits and adds value to both the environment and the community.

Marsden argues that these two paradigms will engender ‘contested sustainabilities’ and have profound effects on agri-food, rural development, and thus on sustainable place-making. One of the vectors for the change he envisions is governance, with a shift away from the debilitating, neoliberal form of governance that is dependent on increasingly unstable and financialized systems to novel, more proactive, reflexive governance networks, including the “decisive and fundamental role of the state and the public realm in resolving contradictions between food security and food sustainability” (pp. 153–154).

This book is focused on agri-food and rural development in the UK, so one might ask how it applies to North America, with its complex mix of farming communities, lumber communities, mining communities, fishing communities, indigenous communities, and northern and remote communities. First, the negative effects of neoliberal globalization are felt around the world, albeit unevenly, and rural communities of all kinds have

been victims of its extreme exploitation (Sumner, 2007). What Marsden sees in the UK translates well to Canada and the United States.

Second, the paradigmatic choice we face is also international, and we are widely familiar with the struggle between the bio-economy that promotes so-called ‘sustainable intensification’ and genetically altered organisms to increase consumerism, and the eco-economy that is championed by alternative food movements and their potential (as yet unrealized) to transform the role of food, support rural communities, and promote sustainable place-making.

And third, instead of dismissing rural communities as marginal to global competitiveness and anachronisms in an urban-focused world, we can clearly recognize Marsden’s argument that rurality is “central to the post-carbon economy and needs refreshed governance frameworks which both recognize and promote this” (p. xii).

This book is aimed at an educated audience and demands attention to nuance and detail. As such, it can act as a springboard for academics to teach, advise and research differently, and relate more comprehensively with rural communities, and for policy-makers to actively engage with the unfolding possibilities of the eco-economic paradigm.

In the end, food matters, rural communities matter, and sustainable place-making matters. Only someone with Marsden’s erudition and conceptual reach can pull these vital spheres of life together into a vibrant and coherent whole. In an era of uncertainty and contested sustainabilities, he is laying out the parameters for “creating new spaces and places of possibility and agency for new forms of empowered and more sustainable forms of resource governance to take hold” (p. 19). We can learn from his ideas and examples and use them to create sustainable food systems for all communities based on “translocal rather than globalized relations and knowledge flow” (p. 155). 

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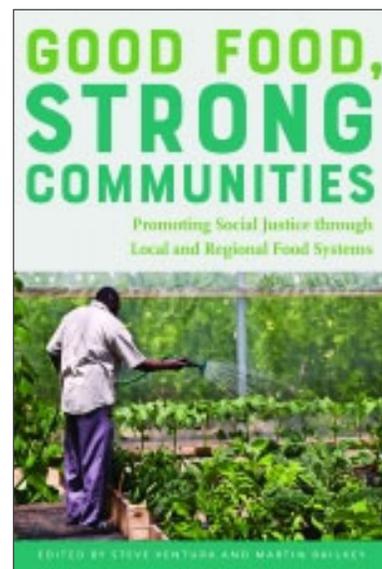
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Strong book on building community through food

Review by Amy Crone *
Maryland Farmers Market Association

Review of *Good Food, Strong Communities: Promoting Social Justice through Local and Regional Food Systems*, edited by Steve Ventura and Martin Bailkey. (2017). Published by University of Iowa Press. Available as paperback and ebook; 304 pages.

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Good Food, Strong Communities: Promoting Social Justice through Local and Regional Food Systems is a book borne out of the Community and Regional Food Systems (CRFS) project, which began in response to a United States Department of Agriculture (USDA) request for proposals regarding food insecurity. Guided by Wisconsin-based aca-

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dem institutions, the CRFS has program participants in seven cities (Madison and Milwaukee, Wisconsin; Boston; Cedar Rapids, Iowa; Chicago; Detroit; and Los Angeles). While the book contains examples from all seven cities, it is primarily focused on efforts in the Midwest. I have participated in a number of such regional efforts, including food policy councils, and have both responded to and reviewed USDA proposals focused on food insecurity. My focus is on the Mid-Atlantic region, but I have traveled across the country working on farmers market and food system efforts that are coupled with social justice. This book was of interest as I hoped to find inspiration for our work in Maryland and the region.

Consistent themes running through and connecting all fourteen chapters are valuable presentations, analyses, and reflections on building equita-

ble community partnerships. These chapters, each written by different authors, cover the topics of food system change, land tenure for urban agriculture, urban food production, food distribution, food processing, markets, the consumer, soil, food justice, collective impact, education, planning, culture, and innovations. One weakness of the book is the lack of inclusion of failed efforts and an analyses thereof; this would be illustrative of how food systems work can evolve over time as conditions change. Furthermore, a few of the examples included have now closed down—most notably Growing Power in Milwaukee.

In each chapter, several perspectives on a given topic are presented, thus allowing the reader to gain sufficiently detailed knowledge to have a fuller sense of the challenges and opportunities on such intransigent food systems issues such as food security, affordable land, food access, regional distribution, healthy food supply and demand, collective impact, policy, and change. A plethora of examples help illustrate how some groups have succeeded in improving their community food systems, while others are still working toward dismantling historical inequities and finding the right framework for change. Monica Theis's chapter on "The Consumer" provides an insightful dissection of the oversimplification of food activists' and writers' messages on what constitutes healthy eating and why it is not enough. Theis then continues to elaborate on the complexities of "the farm-to-table continuum" (p. 126) for distinct consumers, and adeptly defines food literacy in the context of improving healthy eating. The chapter concludes with the successful work of the food pantry at Middleton Outreach Ministry in western Wisconsin. This pantry has accomplished what most do not: providing fresh food and community education while simultaneously moving food quickly to avoid spoilage and work within space limitations.

The chapter on federal policy by Lindsey Day-Farnsworth and Margaret Krome is one of the best and concisely articulated summaries of the creation of federal food policy I have read in recent years.

Including the role of administrative implementation as well as defining the relative authority of federal, state, and local governments leads into an illustrative example. The authors demonstrate how policy interventions in each phase of the food system can affect economic development incentives, licensing and regulations, and programs and services. This chapter should be required reading for anyone working in the pursuit of food systems and policy change.

The book provides a wide variety of perspectives, and readers may find the specific interventions to be most informative. These include but are not limited to the chronicling of the Detroit People's Food Cooperative, NeighborSpace in Chicago, the Los Angeles Food Policy Council, Community GroundWorks Orchard Project, DudleyGrows in Massachusetts, and others. *Good Food, Strong Communities* is a good reference to have on hand as a tool to understand what efforts have been put forth toward community-based food security, even though some of the entities described in the book are no longer in operation.

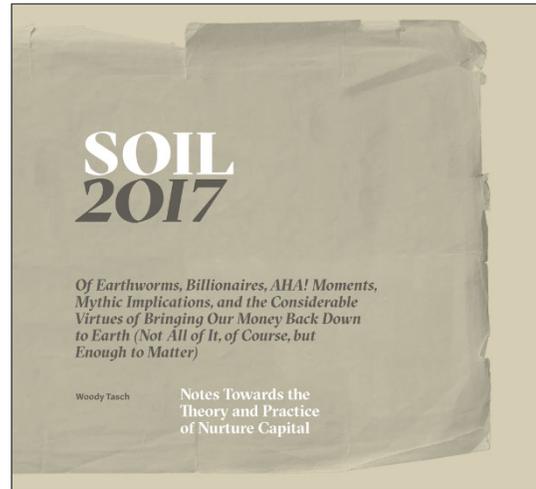
This book is an excellent primer on the various complexities of food systems work, and how there are many links in the food chain that can be improved to sustain a more robust local food economy. The editors have done an outstanding job of providing subject matter experts to cover each topic. The chapter authors do not gloss over the challenges of such work, but rather present them as opportunities for improvement. The only weakness of the book may be that it paints too rosy a picture of social justice through regional food systems; there is little mention of the struggles and failed efforts that have occurred in the area covered. *Good Food, Strong Communities* is an excellent entry point into the complex work of food systems change. It is a worthwhile read for both newcomers to the field and seasoned experts. All readers will benefit from the topical organization of the book, as well as the focus on social values and the conversational tone that is sometimes absent from academic writing.



Investing in local food, investing in local communities

Review by Thomas Bolles *
 Virginia Cooperative Extension

Review of *SOIL: Notes Towards the Theory and Practice of Nurture Capital*, by Woody Tasch. (2017). Published by Slow Money Institute. Available as paperback; 166 pages. Publisher's website: <https://slowmoney.org/publications/soil-notes-towards-the-theory-and-practice-of-nurture-capital>



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SOIL: Notes Toward the Theory and Practice of Nurture is by Woody Tasch, the founder of the Slow Money Institute, which seeks to rebuild the economy from the ground up with an emphasis on sustainable local food systems. This book lays out Tasch's vision for building local food systems.

SOIL is an interesting and entertaining read. It is not a just-can't-put-it-down read, but I think that is the point. Festooned with side notes, the text forces you to break up the read. In many cases, the notes not only tie into the text but also are teaser for the reader to go back and dig deeper. Tasch's writing style is hard to define, but it has a very

literary quality. The text is more a conversation than a formal dissertation. Tasch engages the reader, circling back and tying up his points to weave a plan of hope for the future.

The book is divided into two parts. Part One, *Poetically Incorrect*, is filled with stanzas and stories to get the reader comfortable with the sometimes-nonlinear journey they have embarked upon. It makes it clear this is not your typical book about soil or economics.

Part Two, *Imagination*, is divided into four chapters. It begins with *Whereabouts*, which offers an introduction to what is to come and makes a case for imaginative thinking and balance as we look to the future.

In *Return*, Tasch lays out the importance of giving back—back to the land and back to the community. This chapter is not a call for a socialist

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utopia. It lays out a model for sustainability that fits within a capitalist framework. It starts with the importance of returning carbon to the earth, a task humanity has largely ignored as civilization has advanced. The book offers an eclectic band as part of the solution to our carbon problem—a colonial administrator turned composter, an actor turned philanthropist, and hordes of soil dwellers.

Sir Albert Howard's observations in India led him to understand the stability of the natural cycle of growth and decay. He became the father of farming in concert with nature. He saw the value of working with nature, not against it.

Paul Newman believed we should be like the farmer who puts back into the soil what he or she takes out. He put this into practice by creating a company that donates 100% of its profits to charities. Though Newman's Own is discussed early in the chapter, the book later circles back to how philanthropy has begun to evolve from the make-as-much-money-as-possible-and-give-some-of-it-away model to a model that involves investing locally and slowly in enterprises that are critical to the health of the community, the homes within it, and the soil beneath it.

The importance of soil health has become more evident in recent years. The book discusses the special relationships microbial populations in the soil have with plants. It also references the microbial universe in the gut which were brought to light in *The Hidden Half of Nature* by Montgomery and Bliké. The book shows how fair trade can be a reflection of these natural, symbiotic systems.

Also, within this chapter is a discussion of the modern economy. As life has sped up, the growth of economies has been exponential. The drive for ever increasing returns has moved us to a point where we have made decisions for monetary return without considering the effects. The argument is made that this type of investing tends to pull money and vitality out of communities, as money is concentrated in national and international corporations instead of being retained locally to be reinvested in the communities' health and welfare.

One of the interesting points raised is what gross domestic product measures and, more importantly, what it does not. GDP can show economic growth, but that doesn't always translate to

progress and happiness. GDP relates to the quantity of cash flow, not why it flows. GDP considers money spent cleaning up a toxic spill to be the same as money flowing into school lunch programs. Relying solely on GDP does not give a clear picture of how cash flow affects quality of life and the health of communities.

The third chapter in Part Two, *Nurture*, focuses on the importance of nurture capitalism. A subset of capital expenditure at the intersection of investment and philanthropy, nurture capitalism is the idea that investing in local food systems nurtures the land, the community, and the businesses that support them. This type of investing allows more money to stay in the community and helps the community remain viable.

Nurture capitalism is an investment in more than just businesses. It is an investment in the health and well-being of the land and people that make up a community. It allows for food systems based on sustainable ecological principles to be financially stable. Nurture capitalism is an investment in a quality of life, where the intrinsic returns are shared by the community.

The book does not argue for an economy based solely on local investment. It asserts that as so much of the economy is rooted in the national and global interest of bigger and faster returns that meaningful local investment has been lost. By investing locally, we can achieve more balance in the capitalist system.

The final chapter, *Hereabouts*, discusses how supporting local food systems is complementary to commodity agriculture and global distribution systems. It argues that local food systems allow for more diversity in what is grown as well as more organic farms. This allows for healthier food choices, a healthier environment, and healthier communities.

Included in this chapter are pragmatic steps for putting money back into communities. Individually, things such as patronizing farmers markets, community supported agriculture farms (CSAs), local food retailers, and farm-to-table restaurants help to keep money in the community. Collectively, through nongovernmental organizations (NGOs) and political action, engagement in the community can bring about positive change.

This chapter also includes the case study of Slow Opportunities for Investing Locally (SOIL), a nurture capital group in Colorado. The capital comes from locally generated donations. Anyone who donates receives one vote in decisions made by the group, regardless of how much they donate. SOIL then offers interest-free loans to support local food systems.

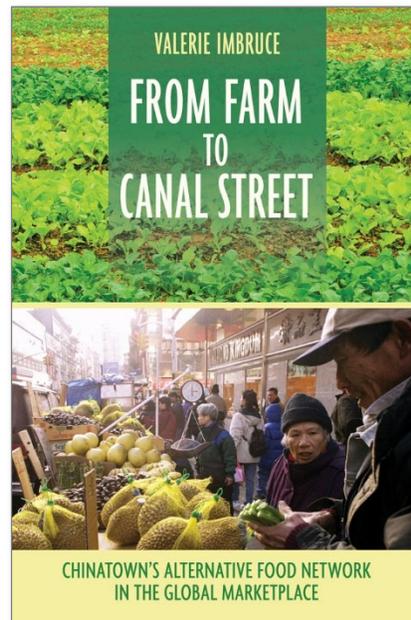
SOIL lays out the principles of slow money in an entertaining and engaging way. It concludes with a call to determine what we value and take action for the betterment of the community. It challenges us to contribute to an economy that is based on restoration and health, rather than consumption and wealth.



Hidden in plain sight: Learning from Chinatown's produce distribution system

Review by Nevin Cohen *

Review of *From Farm to Canal Street: Chinatown's Alternative Food Network in the Global Marketplace*, by Valerie Imbruce. (2016). Published by Ithaca, NY: Cornell University Press. Publisher's website: <http://www.cornellpress.cornell.edu/book/?GCOI=80140100191750>



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New York's Chinatown has a century-old produce distribution system that supplies the city with more than 200 types of extremely low-cost fresh fruits and vegetables that are sourced from hundreds of small- and midsize biodiverse farms and distributed to a network of vendors and restaurants. Yet this remarkable supply chain has been overshadowed by the gigantic Hunts Point terminal market and the distribution channels operated by the major supermarket chains. It is also overlooked by advocates of direct farm-to-consumer food retail. Valerie Imbruce's *From Farm to Canal Street* unmask this "alternative" food

network, offering important lessons for policy-makers interested in increasing access to healthy, affordable, culturally appropriate food.

Imbruce shows that decentralization is a key characteristic of Chinatown's produce supply chain. At its heart is a cluster of very small and competitive wholesalers. Most of these businesses are individually owned and operated, virtually all with fewer than 20 employees and the majority with four or fewer staff. This wholesale network sources from a distributed set of farms, warehouses its produce in and around Chinatown, and supplies some 88 produce retailers, many of them "micro-enterprises," on a frequent basis. The entire system is neither vertically nor horizontally integrated, nor dominated by large retailers or distributors.

This distribution system is composed of highly networked small businesses, with relationships between wholesalers and farmers that are often

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based on ethnic and familial ties and longstanding personal connections. Wholesalers deal directly with farmers, negotiating what to grow to meet shifting consumer demand—a lean supply chain that helps to keep prices low. In these relationships, trust between wholesaler and farmer is critical, as farmers sell on consignment to wholesalers who have the power to set prices and pay only after delivery. Trust between wholesaler and retailer is also crucial, as deliveries to the many vendors who operate small sidewalk stands must be timely and frequent.

Another critical characteristic is spatial clustering. The close physical proximity among wholesalers and retailers in the Chinatown area allows for what Imbruce describes as “dynamic and flexible” restocking by wholesalers throughout the day, with small, frequent deliveries that keep the produce fresh without refrigeration. Vendors selling from bare-bones pushcarts or storefront stands and unrefrigerated delivery vehicles keeps prices low, but the system depends on having warehouses close by—not in the Hunts Point neighborhood of the Bronx where much of the food distribution infrastructure is clustered. Yet residential real estate pressure in lower Manhattan makes sustaining warehouse space in this neighborhood a challenge.

Chinatown’s distribution system might easily be dismissed as anachronistic, a vestigial remnant of an increasingly consolidated global food supply chain. Yet, Imbruce explains that it is both rooted in place and connected to global producers, relying on conventional distribution infrastructures, like the Port of Miami and integrated trucking companies, to move product from farm to market. For example, the smallest growers who supply Chinatown are able to do so only because they have a symbiotic relationship with major food distributors, transporting their comparatively tiny shipments of specialty vegetables by literally piggybacking on and filling the spaces of refrigerated trucks that move commodities from Florida to New York. These small-scale suppliers remain in business because of global supply chains, not in spite of them.

The most interesting parts of the book include chapters 3 to 5, which detail the operations of

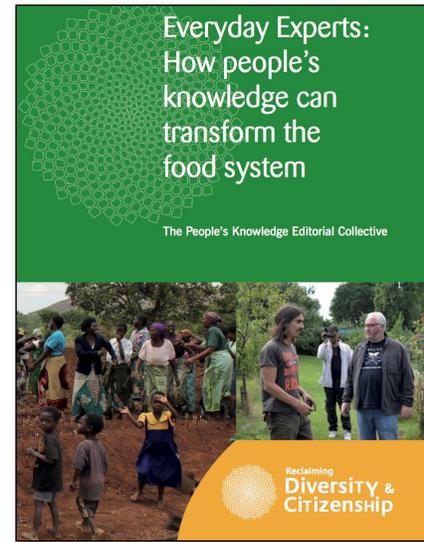
farms in Florida and Honduras that supply Chinatown. Vegetables sold at rock-bottom prices, without the accompanying information about their provenance that you might see at a farmers market or Whole Foods, typically signify the products of unsustainable industrial agriculture. Imbruce, who has a Ph.D. in Economic Botany, conducted field research on the varieties grown and the farming practices used by Chinatown’s growers, and what she observed was a network of highly biodiverse farms with sound horticultural practices. On the several-acre “homegardens” in Miami-Dade County, for example, farmers grow wide varieties of fruits, herbs, and vegetables by using frequent crop rotation and intercropping. Most of the more than 400 Honduran farms that supply Chinatown have transitioned from growing via ecologically unsustainable and financially precarious monocultures to growing more than a dozen varieties of Asian vegetables using sound farm management practices.

Though based on research conducted in 2006, *From Farm to Canal Street* offers several valuable lessons for food systems planning today. Sustaining alternative food supply chains that support biodiverse farms requires attention to zoning policy in cities, specifically the need to preserve mixed industrial and commercial land uses on which distributed supply chains depend. As neighborhoods gentrify and affluent residents seek to remove messy mobile food vendors, protections from displacement are important to sustain the supply of affordable fresh food. Including small-scale food retail networks in government incentive programs now directed at conventional supermarkets could help to finance infrastructure that would make distributed food supply chains possible, like neighborhood-based food distribution hubs. Measuring and communicating the ecological and economic impacts of ethnic food supply chains can raise their visibility and build political support for them. Finally, and this is a point Imbruce stresses throughout her book, Chinatown shows us that the binary notions of local/global, sustainable/industrial, or niche/conventional may not be useful in building food networks that are vibrant, affordable, healthy, and resilient. 

Transforming the food system is the people’s work: Experiential knowledge shows us the way

Review by Branden Born *

The People’s Knowledge Editorial Collective (Eds.). (2017). *Everyday Experts: How People’s Knowledge Can Transform the Food System*. Coventry, UK: Coventry University. Available for free download at <https://www.coventry.ac.uk/everyday-experts>



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This volume, available online as chapters or in full, is designed to support people’s participation in decision-making in their localities and around their food and food system. It showcases examples that balance efforts of people with process knowledge (e.g., academics and other professionals) with those who have experiential knowledge (i.e., lived experience). The latter are the everyday experts of the title. Their stories, projects, lessons, and challenges run through 28 chapters and demonstrate the editorial collective’s interest in affirming multiple epistemologies and methods. By de-centering the professional experts, the editors fulfill their “call for the recognition and affirmation of Indigenous, local, traditional and other non-

mainstream knowledge systems” (p. xix). Instead of reporting knowledge simply based in science and scientism, the editors have brought together a group of author participants who share an understanding of a broader set of knowledges driven by co-production in nonhierarchical dialogue, including multiple indigenous epistemologies. If you have read, or written, about how society needs a transformation in how we go about addressing social justice and environmental sustainability or regeneration in the face of mounting global challenges, this book will be a valuable contribution to your reading list and you might find inspiration here. In fact, it would be hard not to.

The editors, and most chapter authors, would seek to disrupt the hegemonic domination of capitalist market and scientific logic in both food and knowledge systems. They seek cognitive justice, the “active valuing of different knowl-

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edges” and critique of Western science and neo-liberalism (pp. xix, xxi). In many chapters this is manifest by a decolonizing framework, explicitly rejecting top-down knowledge creation and the dispossession of people’s knowledge on land, plants, and animals. This puts the communities and projects in the book up against almost unyielding forces in the global food system: past and present Green Revolution schemes, and the legal, technical, and industrial model of food, agriculture, and economic production. While this seems like it might be a Sisyphean task, doomed to exhausting community members in a never-ending losing battle, the point of the book is exactly the opposite. Instead of showing futile efforts, the cases demonstrate alternatives to the current system and epistemology and the logics that drive it. In this regard, the cases represent a myriad of Davids, simultaneously facing up against an industrial food system Goliath. And for that reason this book is not just valuable, but important. Alternative food initiatives in the Global South and Global North are in need of inspiration, connection, and networking based on solidarity and shared interest. Cognitive justice through the recognition of many forms of knowledge necessarily suggests sharing through nonhierarchical networks of communities and organizations, and explicitly rejects knowledge hierarchies. Books like these, especially when made available for free via download, provide opportunities for community projects to discover and learn from each other regardless of location.

As to the electronic format, the authors take advantage of it in more ways than just the download access. They include active links to sources, organizations, and even videos on several platforms that detail projects such as community theater for grassroots education, agricultural techniques, and peer-to-peer learning. Reading the chapters can become non-linear due to the ease of visiting links to organizations’ activities. For the most part this enriches the case studies by allowing the reader to see, literally, the places and projects being described. This seems like a contemporary and productive way for disseminating materials to food systems researchers and practitioners, allowing the subjects to speak for themselves and

demonstrate in their own way the practices they want to share, and thus somewhat avoiding the expropriation of knowledge about which the editors are concerned.

The book is organized into five thematic areas: (1) Participatory research-practitioner reflections, (2) knowledge process in social movement organizations and nongovernment organizations, (3) education and critical learning processes, (4) community-university engagement, and (5) autonomous approaches to action research (knowledge processes occurring in spaces outside mainstream institutions). I found some overlap here, with many chapters including more than one of the themes. This meant that I was engaged with each section in similar ways and did not strongly identify chapters with sections. For the reader, this means that they will want to look beyond the section(s) that might interest them most and read from each part of the book.

One strength of the book is that it provides numerous examples of alternative, grassroots forms of organizing and implementing projects for social change in the food system. From reflections on top-down and bottom-up strategies to autonomous systems development, there are cases to be learned from. I knew of only a couple. The framing in the introduction is worth reading itself as a standalone chapter. The food sovereignty and community empowerment elements that run through most chapters are by now common strategies in alternative food movements and the literature that engages them.

The gap the book attempts to fill, and does so to a reasonable extent, is the examination of methods and methodologies used by social movements “to reclaim and mobilize knowledge” (p. xxvi). The editors and authors use these “knowledge strategies” to reflect on several objectives laid out in the introduction: challenging the frame of Western scientism, working collectively to produce knowledge and building solidarity between those groups doing so, developing critical understanding through education and reflection, and providing examples and analysis (pp. xxix–xxx). In large part the book is successful in most of these objectives, although the short format of the chapters does not really allow much space for in-depth

analysis of methods and outcomes once cases are defined and explained. Many of the cases suggest they use the theory or pedagogy of Paulo Freire or Orlando Fals Borda, or some version of participatory action research. While this is apparent, the discussion of such theory in practice is often cursory and would be a fruitful topic for further explanation in those chapters, particularly where academics enlist such framing.

The strength of the book—many locations and cases—is also one of its weaknesses. It can seem repetitive and sometimes shallow. This is perhaps not unexpected; it is where a survey-style book is likely to suffer. However, perspectives on how important this is in the current example will vary by reader. In most ways the objectives are met. Organizationally, the thematic areas help structure the chapters, but the chapters are so similar in form and limited length that it feels a bit repetitious—like speed dating for alternative food networks. That said, the repetition itself is interesting because it suggests a certain amount of either autonomous or networked learning about social processes happening in many places somewhat simultaneously. Perhaps this is something to be continuously relearned: environmentally and socially, just food systems work requires participation and leadership from the people most connected or impacted by the work. Regarding the depth of treatment of the cases, those who seek a deeper understanding of practice through thorough descriptions of methods are likely to be somewhat disappointed. Also, relating to the repetitive structure of the chapters, the concluding remarks in each are often perfunctory—and almost not necessary in such short pieces. I would rather have had

more description of methodological decisions or analysis.

However, because the book brings together as authors everyday experts, academics, and students and young people, and is written for a popular audience, it is appropriately read as a survey piece. It provides an overview of many locations, organizations, and efforts to improve the existing (or bringing about a new) food system while pushing back the current globalized food system. As such it is an excellent resource. Additionally, while chapter bibliographies are uneven, some provide excellent references for those interested in pursuing the themes further. Thus, the weaknesses of this book are almost inherent in the way it came about and its editorial interest in inclusion, solidarity, and demonstration. And the strengths significantly outweigh the weaknesses in this case.

I would have liked to see another chapter or two that developed some cross-cutting themes more deeply, like indigeneity and sovereignty in a modern context, or the longer-term or larger scalar implications of nonhierarchical, highly locally dependent decision-making and action. Given the richness of the many cases, it would have been nice to see if they have something to say about a practical issue within anarchistic thought: what happens when crossing scales, or at border cases when boundaries come together? This area would have been a fruitful one to advance theory with practical, everyday experience. That's not really the point of this book, though, and I realize my interests as an academic in the challenges of praxis are not really part of the books' objectives. I remain inspired by what was presented, and have a new list of projects to investigate and reading to do. 