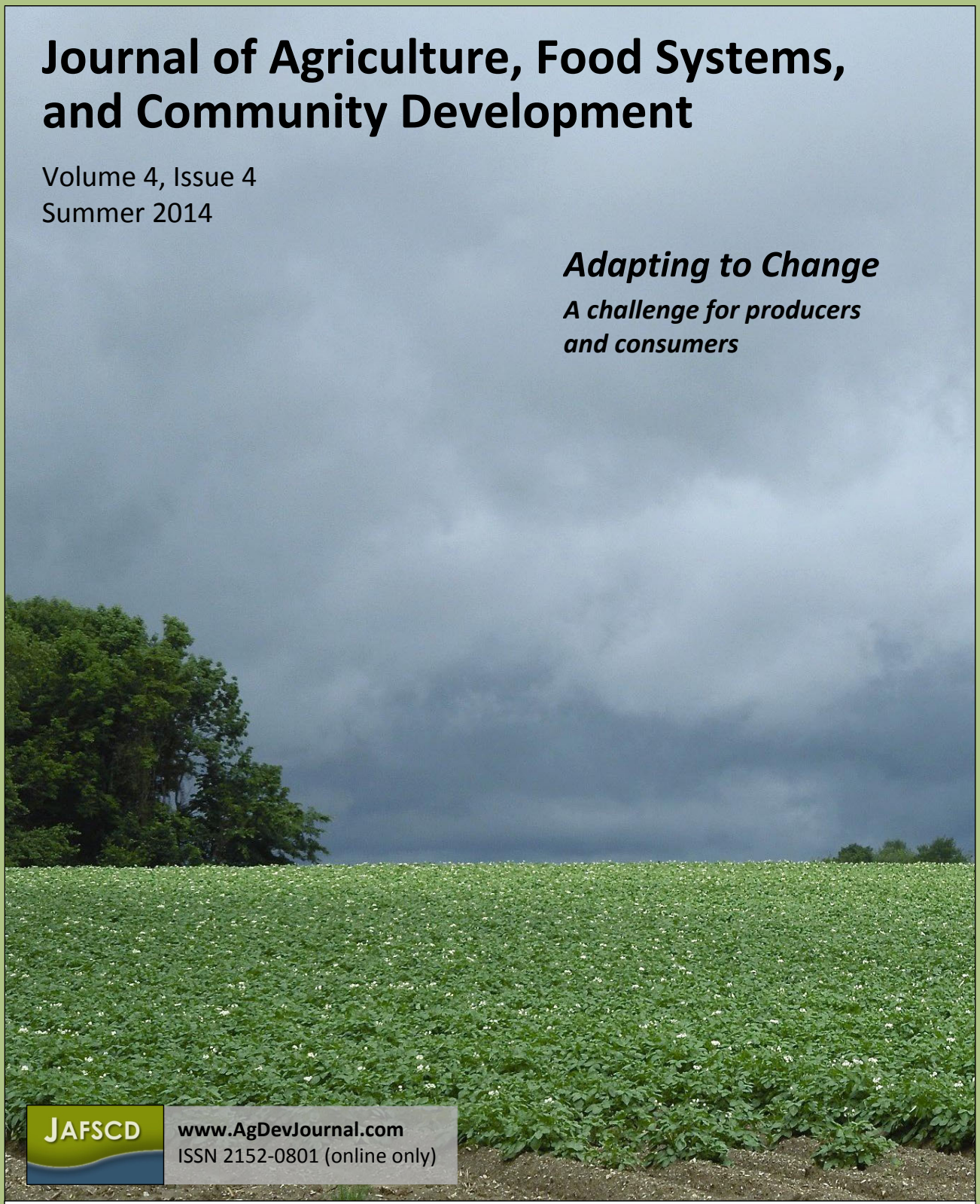
Journal of Agriculture, Food Systems, and Community Development

Volume 4, Issue 4
Summer 2014

Adapting to Change

A challenge for producers and consumers



JAFSCD
www.AgDevJournal.com
ISSN 2152-0801 (online only)

Published by the Food Systems Development Project of the Center for Transformative Action with the support of:

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Journal of Agriculture, Food Systems, and Community Development

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The *Journal of Agriculture, Food Systems, and Community Development,* ISSN 2152-0801 (online only), is published quarterly (Summer, Fall, Winter, Spring) by the Food Systems Development Project of the Center for Transformative Action (an affiliate of Cornell University). Journal office: 295 Hook Place, Ithaca, NY 14850 USA.

Online subscriptions: Farmer/Student/Sole Proprietor/Retiree: US$39; Agency/Nonprofit Staffperson: US$49; Faculty/Consultant/Corporate Employee: US$69; Institutional Library: US$227–US$658 (based on FTE students).

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Journal of Agriculture, Food Systems, and Community Development
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On the cover: Increasingly variable weather patterns, and in particular intensive rainfall events, increase the likelihood of soil loss and ultimately threaten long-term soil productivity on farms like this one in central Maine, near Exeter. See the paper in this issue *How to Communicate with Farmers about Climate Change: Farmers' Perceptions and Adaptations to Increasingly Variable Weather Patterns in Maine (USA)*. *(Photo by John M. Jemison and used with permission)*

(Continued)

Book Reviews

The Food Systems Development Project of the Center for Transformative Action (an affiliate of Cornell University), publisher of JAFSCD, is grateful for the support of our sponsors.

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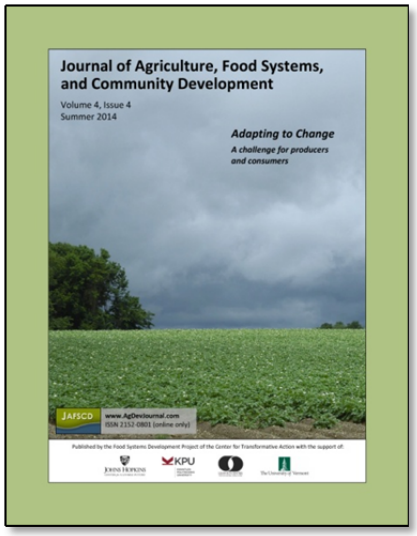
IN THIS ISSUE

DUNCAN L. HILCHEY



Adapting to change: A challenge for producers and consumers

Published online September 19, 2014

Citation: Hilchey, D. L. (2014). Adapting to change: A challenge for producers and consumers [Editorial]. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 1–3. http://dx.doi.org/10.5304/jafscd.2014.043.018

Change is always in the wind, but the pace at which change is taking place in many aspects of human endeavor is clearly hastening — and leading to a socioeconomic bifurcation that includes some good, and some not so good, trends. Evolving food systems are no exception: witness the growth of both big farms and small farms, obese citizens and hungry citizens, greenfields and brownfields, food oases and food desserts, industrial ag and artisanal production, and so on, while the middle scale of almost everything continues to decline rapidly. Progressive producers and consumers have to work against cultural and economic inertia, making it a bit more challenging to adapt to rapid changes for those building the bandwagon upon which others (e.g., greenwashers) simply jump.

In this issue a number of columns and papers touch on the theme of adapting to change and shedding light on ways of managing it, including climate change (as represented on our cover) and social and economic changes.

We begin this open call issue with a letter to the editor from **Dave Gutknecht** and **Joan Stockinger** regarding **Ken Meter**'s spring 2014 column "Co-ops and Collective Impact" (vol. 4, issue 3, pp. 11–14). Ken had referenced their groundbreaking report "Twin Cities Cooperative Local Food System," and they wanted to offer some clarifying comments. Ken's response follows.

As this is an open call issue, our columnists were able to focus on topics of their choice. In her Digging Deeper column, "A Different Way To Approach Policy Change," **Kate Clancy** explores how to choose which policies offer the best solutions to a particular problem within complex adaptive food systems. In his Economic Pamphleteer column, "Beyond Economic Growth," **John Ikerd** echoes J. M. Keynes in calling for a new vision of food systems that emphasizes the art of living well. **Ken Meter** argues in "Designing Food to Suit Our Infrastructure?" that if we want to, we can invest in shorter supply chains that suit the needs of both family farms and consumers.

In this issue we are including two papers that didn't make it into previous special topic issues. In "Institutional Dimensions of Farmland Conservation: Applying the Institutional Analysis and Development (IAD) Framework to the U.S. Conservation Reserve Program," **Kerri Morrison** and **Scott D. Hardy** explore factors at the local level that affect implementation of the Conservation Reserve Program. And **Aijuan Chen** and **Steffanie Scott** provide three case studies of producer cooperatives in China that offer insights into how they benefit members and contribute to rural development in "Rural Development Strategies and Government Roles in the Development of Farmers' Cooperatives in China."

Next, **John M. Jemison, Jr., Damon Hall, Stephanie Welcomer,** and **Jane Haskell** report their findings from focus groups with farmers in Maine, including dozens of production practices reported by participants of how they will deal with increasingly variable weather patterns, in "How to Communicate with Farmers about Climate Change: Farmers' Perceptions and Adaptations to Increasingly Variable Weather Patterns in Maine (USA)."

Coincidentally, we accepted a number of papers related to the management or benefits of farmers' markets. In their exploratory study "Understanding Collaboration Among Farmers and Farmers Market Managers in Southeast Michigan (USA)," **Crystal L. Miller** and **Dan McCole** report the results of a survey that sheds light on how farmers and farmers market managers may collaborate to achieve shared objectives.

David J. Connell and **Christopher Hergesheimer** offer a commentary on how a more business-oriented approach to farmers markets management does not have to compromise their unique mission and setting in "Strengthening the Core Business of Farmers Markets through Strategic Business Planning."

The benefits of direct communication on specific topics of interest are the focus of "Consumer and Producer Information-Sharing Preferences at Arizona Farmers Markets" by **Keri Szejda Fehrenbach** and **Christopher M. Wharton.**

In "Where Urban Residents Shop for Produce," **Allison Karpyn, Karyn Tappe, Amy Hillier, Carolyn Cannuscio, Julia Koprak,** and **Karen Glanz** provide a sketch of a sample of urban produce shoppers (mostly people of color) and how financial inducements might encourage them to shop at farmers' markets.

Jared T. McGuirt, Rachel Ward, Nadya Majette Elliott, Sally Lawrence Bullock, and **Stephanie B. Jilcott Pitts** similarly identify the barriers women experience in buying local produce in "Factors Influencing Local Food Procurement Among Women of Reproductive Age in Rural Eastern and Western North Carolina (USA)."

Seeking to understand why the state with the largest number of small farms would have one of the smallest numbers of organic farms, **James R. Farmer, Graham Epstein, Shannon Lea Watkins,** and **Sarah K. Mincey** report the results of a mixed methods study in "Organic Farming in West Virginia: A Behavioral Approach."

Samina Raja, Diane Picard, Solhyon Baek, and **Cristina Delgado** provide an in-depth case study of local food activism in "Rustbelt Radicalism: A Decade of Food Systems Planning Practice in Buffalo, New York (USA)."

As if to summarize many of the challenges raised and addressed in the above, our final paper, by **Connie H. Nelson** and **Mirella L. Stroink,** explores the tensions inherent in a just food system in "Accessibility and Viability: A Complex Adaptive Systems Approach to a Wicked Problem for the Local Food Movement."

Finally in this issue we present two book reviews: **Stacy Miller** reviews Douglas Gayeton's *Local: The New Face of Food and Farming in America* in a review entitled "Language as Lever: Can the Lexicon of Local Make a Global Impact?" and **Nadra Hashim** reviews *Globalization and Food Sovereignty: Global and Local Change in the New Politics of Food,* edited by Peter Andrée, Jeffrey Ayres, Michael J. Bosia, and Marie-Josée Massicotte, in her review, "Locating Nation, State and Identity in the Global Food Debate."

With this summer issue we complete our fourth volume of JAFSCD. A core group of very dedicated advisors and reviewers have actually been with us for **five years,** including our planning year — since October 2009! I'd like to take this opportunity to express our deep gratitude for their commitment to us and the mission of JAFSCD.

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* These advisors have also served as reviewers for five years.

Duncan Hilchey

Publisher and Editor in Chief

Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
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LETTER TO THE EDITOR

Letter to the editor regarding Meter column

Received August 19, 2014; published online September 8, 2014

Citation: Gutknecht, D., & Stockinger, J. (2014). Letter to the editor regarding Meter column. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 5–6.
http://dx.doi.org/10.5304/jafscd.2014.044.012

August 19, 2014

Dear Editor,

We truly appreciated mention of our study, "Twin Cities Cooperative Local Food System," in JAFSCD, volume 4, issue 3 (spring 2014) in the column entitled *Co-ops and Collective Impact*, by Ken Meter. One of the goals of our case study was to profile a commercially viable local food system and to share that experience with food system developers. We have a couple of clarifying comments that we think might be of use.

Meter describes the independent nature of the 15 retail food cooperatives in the Twin Cities, while later acknowledging "a significant common vision of growing the co-op sector." He notes that as independent stores, "each differentiates itself from the other, and often their competitive bent reduces any potential synergy." While we certainly saw evidence of the limitations to possible synergies, we also found a number of significant ways these stores cooperate. We did not describe these local synergies in any depth in this report — our topic was local food, and the study was already long.

The synergies are not as strong as in a unified local retail co-op system (such as PCC Natural Markets in Seattle), but during the latter 20 years in particular, the Twin Cities food co-ops have often pioneered joint purchasing and standard operating practices, and these are now the norm.

One of the most powerful ways the independent retail stores cooperate is in the pooling and reporting of financial information through a national organization. Meter writes that "there has been only sparse mutual reporting of metrics," and that is true on a local level. But beginning in 1987, Dave Gutknecht and Scott Beers collated and published pooled financial data from retail food co-ops nationally in the trade magazine *Cooperative Grocer*. More than 10 years later, this had evolved into a nationwide collaborative effort that gave rise to food co-ops' Common Cooperative Financial Statements and a sophisticated data-sharing service now

offered by Co-op Metrics, Inc. These common metrics are invaluable decision tools for both managers and boards and provide benchmarks that often lead to sharing of expertise across stores. Co-op Metrics is a key success factor for our Twin Cities co-ops and others around the country.

Meter also highlights the important role we found played by the distributor Co-op Partners Warehouse (CPW) in supporting local food producers. We emphasize in the study that locally sourced food is only 20 to 25 percent of CPW sales. To be financially viable, and to offer its strong support for local producers, CPW must be a year-round supplier. Like other distributors, CPW needs volume to achieve efficiencies of scale, and it needs to retain its relationships with (retail and restaurant) customers year-round. Consequently, CPW sources organic product outside the region when product is not available within the region. There are two general approaches to local distribution: one is to focus exclusively on local; the other is to make local a part of a broader distribution program. CPW has taken this second approach.

Most importantly, we thank Meter and JAFSCD for referencing and highlighting our report. We refer people to the Cooperative Development Services (CDS) website for the full report, at http://www.cdsus.coop.

Dave Gutknecht
Editor, *Cooperative Grocer* magazine

Joan Stockinger
Co-op Development Specialist, Cooperative Development Services

Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

LETTER TO THE EDITOR

Author's response to letter to the editor regarding Meter column

Received September 1, 2014; published online September 8, 2014

Citation: Meter, K. (2014). Author's response to letter to the editor regarding Meter column. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 7. http://dx.doi.org/10.5304/jafscd.2014.044.013

September 1, 2014

I am always happy when a column I write sparks a deeper conversation, and I thank my colleagues Gutknecht and Stockinger for bringing important points into focus.

It is certainly true, as they point out, that local food trade in the Twin Cities has grown alongside, and has in part depended upon, shipments of food from warmer climates. I've written about this blending elsewhere, but my focus on "collective impact" in the column may have created the false impression that our co-op sector has grown solely on local food trade. The letter provides an important clarification.

It is also fair to point out that I did not cover some of the ways Twin Cities co-ops do collaborate, though I devoted two paragraphs to the sector's accomplishments. The purpose of my column was not to critique either the co-ops or the paper, but to use some of the material in the fine report [from Cooperative Development Services, entitled "Twin Cities Cooperative Local Food System"], as well as my own experience and analysis, to think critically about "collective impact." I believe my column did show that co-ops both collaborate and compete with each other, and I hope this insight will help us act more effectively in the future.

Ken Meter
President, Crossroads Resource Center

Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
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DIGGING DEEPER
Bringing a systems approach to food systems
KATE CLANCY

A different way to approach policy change

Published online August 26, 2014

Citation: Clancy, K. (2014). A different way to approach policy change. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 9–11. http://dx.doi.org/10.5304/jafscd.2014.044.010

A question I've been asked a number of times is: What are the most critical food policies that need to be changed or formulated to meet any number of different goals? My short answer to two such exchanges over the past couple of years have been, "I don't have a clue" and "There are too many to count." If you look at any comprehensive food system map (the one I like best is the Global Food System Map by shiftN (2009) at the Food + Tech Connect website; another good one is the Nourish food system map by WorldLink (2014) at the Nourish website), you'll see uncountable places where a policy or multiple policies are in play. This occurs at every level, from local to global. Some of the existing or recommended policies are supportive of a sustainable, resilient system — and many are not. Furthermore, and most importantly, many have never been examined well enough in a strategic, systemic way to be identified as useful or not.

It strikes me that it might be helpful to have some better tools to help people decide what policy change might be most appropriate in a particular situation — not just in terms of the politics of the thing, but in terms of optimizing the most variables. The global map shows, for example, that regional or national food security arises out of the intersection of many sectors: science, technology, politics, sociocultural phenomena, population, and education. The environment supports food production and other parts of supply chains, and economics plays the other key supportive role. The task is to examine those variables in terms of their significance for any particular policy proposal.

Kate Clancy *is a food systems consultant, visiting scholar at the Center for a Livable Future, Bloomberg School of Public Health at Johns Hopkins University, senior fellow at the Minnesota Institute for Sustainable Agriculture, and adjunct professor at the Friedman School of Nutrition Science and Policy at Tufts University. She received her bachelor's and Ph.D. degrees in nutrition at the University of Washington and the University of California Berkeley, respectively. She has studied food systems for over 40 years and has held positions in several universities, the federal government and two nonprofit organizations. Her present interests are regional food systems, food security, agriculture of the middle, and policies at all levels to encourage the development of resilient food systems.*

Developing policies that acknowledge the complexity of any system calls for a "comprehensive and integrated analytical approach" (Ericksen, 2008, p. 235). One of the systems concepts I've mentioned before that can be of use in being more strategic and informed about policy targets is complex adaptive systems (CAS). These systems consist of "many diverse and autonomous components or parts…which are interrelated, interdependent, linked through many (dense) interconnections, and behave as a unified whole in learning from experience and in adjusting (not just reacting) to changes in the environment" ("Complex Adaptive System (CAS)," n.d., para. 1). Such a system has a number of properties; one is *individuality,* referring to multiple decentralized actors who adapt their behavior individually. Take vegetable consumption as an example. Only a small percentage of people consumes the recommended level, with individuals offering different reasons for their avoidance — they don't like the taste, they're not easy to prepare, they're not convenient, they cost too much. Other actors are nutrition educators and researchers who try to figure out how to inspire consumers to eat more vegetables, and U.S. producers who export large volumes of vegetables, while wholesalers import about 25 percent of the total fresh vegetables eaten. These actors exist at different scales, and their actions continuously interact.

Another property of a complex adaptive system is *heterogeneity,* which means there is substantial diversity at each level of the system. For example, people and organizations have quite different values and motivations regarding their interest or disinterest in, say, organic or local food. And these goals may be in conflict, such as organic food being more environmentally benign but costing more. A good strategy is to look at a variety of drivers and decide on the most useful entry points for policy change, including recognizing how particular decision-makers make choices among possible outcomes of a policy decision (Ericksen, 2008). Ironically, a broad understanding of the bigger picture allows a project

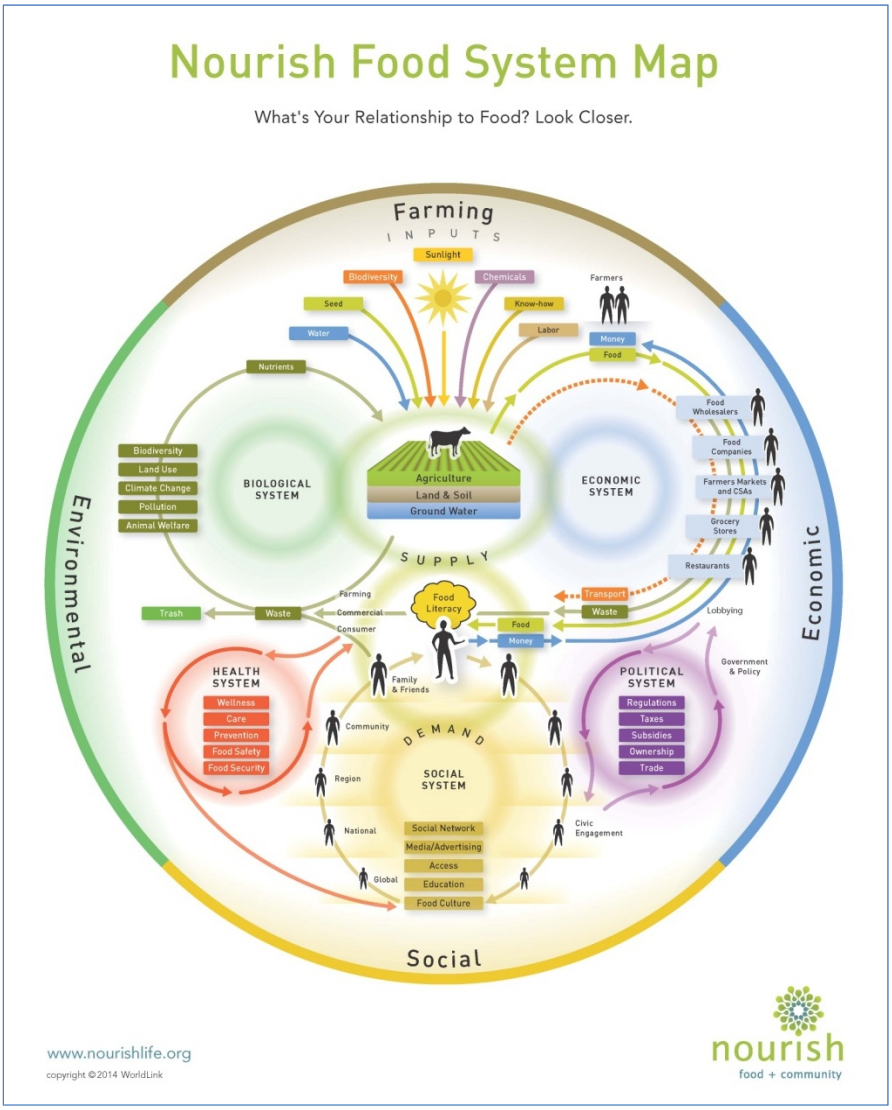

Image courtesy of the Nourish initiative (http://www.nourishlife.org). Copyright 2014 WorldLink, all rights reserved.

or intervention to be more closely targeted for the most impact (Hammond, 2009). For example, if policies regarding the sales of particular foods differ in adjoining states, what type of agreements might be constructed to allow better flow of food products across borders?

A third property of complex systems is *interdependence,* meaning that many pieces interact and connect across different levels through feedback loops. As described in my last column, we have to measure and be aware of cross-sector and cross-scale interactions, or at least be aware that there are links from a scale like regional to higher and lower levels. Ericksen admits that food system variability across scales often results in different outcomes, but goes on to say that understanding how these different policies reinforce or confound one another is a critical step in deciding on a policy strategy. The many connections among levels, scales, locations, and actors provide needed diversity and "strength through the preservation of options" (Newman & Dale, 2009, p. 13), such as in the case of drought in some, but not all, parts of the country where hay is produced, or the counter-seasonal phenomenon of trade in fresh produce.

It might be helpful to have some better tools to help people decide what policy change might be most appropriate in a particular situation — not just in terms of the politics of the thing, but in terms of optimizing the most variables.

One of the ideas inside adaptive management is that a good conceptual framework allows for better decision-making, given the uncertainty and unpredictable outcomes expected with food systems issues (Ericksen, 2008). So, what are some of the steps in deciding which policies offer the best solutions to a particular problem? I offer a few here, which could be expanded to many other items.

1. Develop a framework or an organized approach that links the interactions of relevant factors and can guide decisions.
2. Because the best policies should arise out of governance that has sustainability and resilience as goals, define what sustainability and resilience mean in your particular policy scenario.
3. Become educated about the specific food system problem you are addressing at the deepest level possible within time and resource constraints, including the CAS properties mentioned above.
4. Always think across scales.
5. Develop indicators of intended and unintended change.
6. Conduct evaluations for feedback.

The more you know about a problem and consider where the best leverage point is, the greater your chances of success. Some more time spent on policy strategy is sure to be time well spent.

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ISSN: 2152-0801 online
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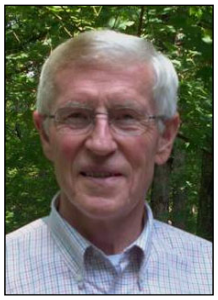

THE ECONOMIC PAMPHLETEER
JOHN IKERD

Beyond economic growth

Published online July 28, 2014

Citation: Ikerd, J. (2014). Beyond economic growth. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 13–15. http://dx.doi.org/10.5304/jafscd.2014.044.002

This is the second of two columns dealing with questions of economic growth. See the first column in the spring 2014 issue.

We need a new vision of the future of agriculture, food systems, and communities. Most Americans seem preoccupied with a vision of economic growth — restoring it, promoting it, and sustaining it. They are unwilling to accept the fact that not only is economic growth not sustainable; it also is no longer either necessary or desirable. We need a new vision that will not compel people to "sell themselves for the means of life" but instead use their time, talents, and energy to "cultivate into

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*Why did I name my column "**The Economic Pamphleteer**"? Pamphlets historically were short, thoughtfully written opinion pieces and were at the center of every revolution in western history. Current ways of economic thinking aren't working and aren't going to work in the future. Nowhere are the negative consequences more apparent than in foods, farms, and communities. I know where today's economists are coming from; I have been there. I spent the first half of my 30-year academic career as a very conventional free-market, bottom-line agricultural economist. I eventually became convinced that the economics I had been taught and was teaching wasn't good for farmers, wasn't good for rural communities, and didn't even produce food that was good for people. I have spent the 25 years since learning and teaching the principles of a new economics of sustainability. Hopefully my "pamphlets" will help spark a revolution in economic thinking.*

fuller perfection, the art of life itself" (Keynes, 1931/1962, p. 368).

The consensus of research into psychological well-being or happiness indicates that beyond some modest level of economic well-being, happiness is related far more closely to the quality of social relationships and a sense of purpose in life than with additional income or wealth (Jackson, 2011; James, 2003). For example, a 2003 article in the *Guardian* references a recent British Cabinet report and concluded that "despite huge increases in affluence compared with 1950, people throughout the developed world report no greater feelings of happiness" (James, 2003, para. 4). Certainly, people in some areas of the world still need economic growth. However, the so-called developing nations need not aspire to the economies needed to support American lifestyles. A 2004 review of more than 150 scholarly studies concluded that beyond per-capita incomes of around US$10,000 to US$15,000 in developing nations, there is little if any correlation between increasing wealth and overall happiness or well-being (Diener & Seligman, 2004). There is no reason to believe this relationship has change in the past decade.

Happiness is related far more closely to the quality of social relationships and a sense of purpose in life than with additional income or wealth.

Other research indicates people in nations with less disparity or inequity in incomes and wealth tend to be happier, regardless of absolute levels (Wilkinson & Pickett, 2009). Even the affluent are happier in more economically equitable societies. *Developed* countries might do far more to increase collective well-being or happiness by improving economic equity rather than promoting economic growth. *Developing* countries could benefit most by balancing their modest needs for economic growth with the need to build more economically equitable societies.

Interestingly, John Maynard Keynes, arguably the most influential economist of the 20th century, anticipated such a time back in the 1920s. He wrote, "the *economic problem* may be solved, or be at least within sight of solution, within a hundred years. This means that the economic problem is not…*the permanent problem of the human race*" (Keynes, 1932/1962, p. 366; emphasis in original). Man's permanent problem will be "how to use his freedom from pressing economic cares…to live wisely and agreeably and well" (Keynes, 1931/1962, p. 367). As it turned out Keynes was too conservative, as the research shows the economic problem was solved as early as the 1950s for many people of the world. The challenge for the vast majority of Americans today is not to try to restore unsustainable economic growth, but instead to learn to live "wisely and agreeably and well."

Our ability to continue to live well economically in the future will depend on the sustainable use of the human and natural resources necessary to sustain the economy. There are endless possibilities, however, for human betterment or improving quality of life even with a sustainable, "steady-state" economy. Ecological economist Herman Daly defines a steady-state economy as "one that develops qualitatively…without growing quantitatively in physical dimensions;…a constant metabolic flow of resources from depletion to pollution…maintained at a level that is both sufficient for a good life and within the assimilative and regenerative capacities of the containing ecosystem" (Daly, 2013, para. 1). A steady-state economy would depend on *qualitative* rather than *quantitative* development to sustain a *good life* for all.

John Stuart Mill, a prominent 19th century economist, also believed in the prospects for continuing human betterment within a "stationary state" economy. He wrote: "It is scarcely necessary to remark that a stationary condition of capital and population implies no stationary state of human improvement. There would be as much scope as ever for all kinds of mental culture, and moral and social progress; as much room for improving the Art of Living, and much more likelihood of its being improved, when minds ceased to be engrossed by the art of getting on" (Mill,

1848/1909, para. IV.6.9).

A fundamental difference between moral and social progress and economic progress is that social and ethical well-being are inherently *nonmaterial* in nature. Progress in these dimensions of life require no *additional* natural or human resources or *materials*. Thus economic growth is not necessary to continue developing human capacities to live more "wisely and agreeably." In addition, shifting priorities to social and ethical progress would free up vast quantities of economic resources, such as those used for national defense, law enforcement, and civil litigation, which could then be devoted to restoring the integrity of the natural ecosystem and remediating dysfunctional societies. If by chance humanity were to reach a state where people no longer desired anything more — economic, social, or ethical — there would be no need for further growth in any dimension of life.

Shifting priorities to social and ethical progress would free up vast quantities of economic resources.

The virtues of social and moral betterment have been proclaimed by all of the enduring philosophies and major religions of the world throughout human history. The American preoccupation with unending economic growth emerged only about one hundred years ago and has only been dominant since the1980s. It seems reckless if not irrational to bet the future of humanity on the "new theology" of economic growth — particularly since there are far better alternatives for achieving a fundamentally better, more sustainable quality of life.

However, Keynes warned that "no country and no people…can look forward to the age of leisure and abundance without a dread. For we have been trained too long to strive and not to enjoy" (Keynes, 1931/1962, p. 368). He suggested that those who would benefit from this new era would be "those peoples, who can keep alive, and cultivate into a fuller perfection, the art of life itself and do not sell themselves for the means of life" (Keynes, 1931/1962, p. 368). We need a new vision of the future of agriculture, the food system, and communities in which people do not feel compelled to "sell themselves for the means of life" but instead "cultivate into fuller perfection, the art of life itself," by learning to live wisely, agreeably, and well.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

METRICS FROM THE FIELD

Blending insights from research with insights from practice

KEN METER

Designing food to suit our infrastructure?

Submitted August 15, 2014 / Published online August 31, 2014

Citation: Meter, K. (2014). Designing food to suit our infrastructure? *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 17–20. http://dx.doi.org/10.5304/jafscd.2014.044.011

Last summer during harvest season, I descended to a hotel lobby in South Carolina eager for a good breakfast. I had just visited vast orchards down the road where peaches were being packed for shipment, and I had seen plentiful local cantaloupe at roadside stands — but the breakfast buffet featured neither of these products. Unripe melon with almost no flavor, grown in a distant place, filled a large bowl. It was what the supply truck had brought in.

When I arrived at the grocery later that day, the local peaches on sale were gorgeous — but not yet ripe. The grocery supplier delivered the same hard peaches that it ships to distant customers. As I spoke with local food leaders about this curiosity, I was told it was difficult to source local food in the state because competing suppliers shipped bountiful quantities of fresh produce from Florida, Georgia, and North Carolina from established, large farms. Due to seasonal harvest schedules, these often arrived just before, or just after, South Carolina producers could ship. Distributors said it was so easy to simply keep shipping from distant sources that the local product often never reached

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the shelves. Buyers were content to purchase Florida produce and call it "local," since they had purchased it from a local wholesaler.

I gained deeper perspective on this, however, when I spoke with some investors in Florida who asked me to assist them with a local food plan. Motivating their interest was a different curiosity: amidst produce farms that shipped food north, much of the produce they found at local stores was coming from Costa Rica. This group wants to invest in creating new local market channels.

Some of these ironies can be explained by price theory: most buyers will look for the lowest price available, all else being equal. In a world where melons and peaches have become standardized commodities, the lower costs of land and/or labor in Costa Rica trump Florida produce grown in Florida, while the lower costs of production in Florida trump South Carolina produce grown in that state. Seasonal availability also plays a role since market prices are often higher at the front end of the season, when people are eager to eat a product that is not yet being harvested in their neighbors' fields.

Yet the curious cases of mobile melons and pre-ripe peaches also reflect a design principle in the food industry itself. We are now designing food that suits our infrastructure, rather than designing infrastructure that handles the foods we've evolved to enjoy. We've selected produce varieties that have good storage qualities — often a thick skin and relatively stable shelf life — and thus we've limited consumer food choices, distorted markets, and reduced biodiversity. It is possible, for example, to grow up in South Carolina not knowing what a truly tree-ripened peach tastes like, since the fruit is harvested early for better shipping.

This rumination led me back to the work of William Cronon, one of my heroes in describing the complex interplay of food, economics, politics, and society. In his massive work, *Nature's Metropolis* (Cronon, 1991), Cronon shows how the metropolitan region of Chicago was fundamentally shaped by the development of several overlapping industries: grain, lumber, meat, railroads, credit, and others. While each of these products has its own "supply chain," each industry interacts with the others as well.

One memorable story is Cronon's description of the evolution of the design of beef. When Chicago was a young city, live animals were often shipped by barge to major cities for slaughter at the outskirts of town. Consumers generally considered only fresh meat to be healthy to eat — and anyway few owned freezers.

The curious cases of mobile melons and pre-ripe peaches reflect a design principle in the food industry itself. We are now designing food that suits our infrastructure, rather than designing infrastructure that handles the foods we've evolved to enjoy.

Cronon outlines how the advent of rail travel created a newly designed product. Beef carcasses could now be processed closer to the farm and shipped in ice-cooled cars by rail to major markets like New York. Moving the carcass from the farm to the retail counter might take a week or more. Consumers at first balked at the idea of buying beef that was so old. So the new industry marketed the concept that aged beef would be a better product, with better flavor. Eventually, aging took hold as a premium consumer attribute.

Yet the most dramatic shifts were yet to come. As industrial growing methods gained strength, grain was modified so that it was more standardized, higher in protein content, and yielded more bushels per acre. Commodity grading techniques allowed distant buyers to trade grain at great distances without actually seeing the product. This separated ownership of the grain from physical possession, reducing the importance of farmers — who had up to then shipped grain in fifty-pound bags labeled with their own name. When this grain that was selected to grow prolifically was in turn fed to cattle that had been selected to gain weight

as fast as possible, animals grew more rapidly, with greater consistency, and were larger in frame.[1]

By the 1970s, further efficiencies were created west of Chicago and outside Cronon's scope. Larger processors calculated that shipping beef carcasses by semi truck (now the main transport device) was inefficient because carcasses came in irregular sizes, leaving empty space in each trailer. One firm began shipping cut, boxed beef. Since each box was packed tightly and boxes could be stacked on each other to fill the entire trailer, each truck hauled about as much meat as possible, with little wasted space. This reduced shipping costs, created a competitive advantage to the early adopters, and moved processing into the hands of the aggregators.

Yet this approach also pushed price margins for raising cattle far below what most family farms could endure. After 1979, the number of farms raising cattle, and farmgate sales, steadily fell until U.S. cattle sales bottomed out at US$44 billion in 2009 (USDA ERS, n.d.). Then new consumer interest in quality meats, combined with producers passing along the costs of higher grain prices when they could, nudged sales levels upward.

Data from the U.S. Department of Agriculture's Economic Research Service (ERS) Food Availability reports show that per capita consumption of retail beef in 2012 (57 pounds or 26 kg) was about the same as it had been in 1909 (59 lb. or 27 kg), after peaking at 94 lb. (43 kg) in 1976 (ERS, 2014a). Total consumption in pounds edged downward even as population rose. The average carcass today produces a lower ratio of meat than it did in 1909 (79 percent to 70 percent); consumers were more likely then to eat organs, tongue, and other products, and perhaps animals carried less fat. The farmer-to-wholesaler price spread has eroded, from 12 percent of the retail price in 1970 to 5 percent in 2013, while the wholesale-to-retail price spread doubled, from 22 percent in 1970 to 43 percent in 2013 (USDA ERS, 2014b). Many Midwestern communities have lost their cattle farmers. This has resulted in a cumulative decline in the number of residents holding farming, processing, and land management skills, as well as a reduction in the power of local communities to choose what they eat.

This seems to be the prevailing paradigm of efficiency: Aggregators with power in the marketplace design beef that ships at lower costs and build commensurate systems for conveying it to markets. This reduces prices and margins and thereby runs farmers out of business, weakening rural communities. Consumers cut back consumption but pay more and more to support the retail food delivery system.

Designing the foods we eat to fit the infrastructure we choose to use creates disruptions in the marketplace and challenges to health, but it is supported in current economic thinking.

As I wrote this column, I spoke with a meat consultant who was not aware that I was preparing this essay. This expert volunteered that the margins are so low in the large-scale industry that "meat has so little value it is almost like a byproduct of the industrial process." Larger profits are made selling hides, offal, blood, and other items that are "waste" to smaller-scale plants.

Meanwhile, my body has multiple ways of informing me that I am healthier if I consume grass-fed beef purchased directly from a local butcher. It is not altogether content with the medium-scale grass-fed varieties that are increasingly available at the stores, but I am glad this alternative is emerging.

Designing the foods we eat to fit the infrastructure we choose to use creates disruptions in the marketplace and challenges to health, but it is supported in current economic thinking because a firm with market power has found ways to make better use of its resources. Through tax incentives and subsidies, we reward firms for moving in this

[1] Although this is not a theme Cronon addresses, we need more research on this question: Does the fact that we are maximizing weight gain in our livestock have anything to do with the fact that humans are also gaining more weight?

direction. Yet creating efficiency for the *firm* is different than creating the most efficient *food system;* what looks efficient from a community standpoint (e.g., wanting lots of farmers, their skills, their work habits, and their children to stay in the community) is often different than the efficiencies of the firm.

In reality, as in Cronon's Chicago, the supply system is an interlaced network of relationships, not a series of independent, single chains. Over time, if we choose to embrace this complex reality, fruits and meats that were designed for long-distance shipping may fall into disuse. We may, indeed, develop the technology, infrastructure, and value networks that make it easier and more efficient to ship fragile, ripe fruit and quality meats shorter distances. We may choose to adopt tax and investment policies that favor short supply networks. We may even share with youth the joy of peach juice running down our chins. 

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
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Institutional dimensions of farmland conservation: Applying the institutional analysis and development (IAD) framework to the U.S. Conservation Reserve Program

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Submitted November 11, 2013 / Revised January 20 and March 6, 2014 / Accepted March 7, 2014 / Published online September 11, 2014

Citation: Morrison, K., & Hardy, S. D. (2014). Institutional dimensions of farmland conservation: Applying the institutional analysis and development (IAD) framework to the U.S. Conservation Reserve Program. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 21–33. http://dx.doi.org/10.5304/jafscd.2014.044.006

Abstract

The Conservation Reserve Program (CRP) invites agricultural producers in the U.S. to voluntarily place land into conservation for 10 to 15 years. The program currently focuses on reducing soil erosion, increasing soil health, providing wildlife habitat, and improving water quality throughout the United States. This study employs a theoretical framework for the understanding of collective action institutions (sets of rules prohibiting, requiring, or permitting specified actions that are established to overcome common problems) in order to examine the external factors, internal structures, and policy decisions of CRP and the impacts these variables have on program outcomes. We collected the data using open-ended, structured interviews with stakeholders associated with the program, and from government documents produced on the CRP by the U.S. Department of Agriculture (USDA) and other local, state, and federal agencies. Results indicate that the biophysical environment, local culture, and institutional rules greatly contribute to program implementation (resources for conservation, decision-making structures, and management strategies) and outcomes (amount and type of land conserved, and level of participation by agricultural landowners).

Keywords

Conservation Reserve Program, farmland conservation, Food Security Act, institutional analysis and development (IAD) framework, policy analysis

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Abbreviations

CCC	Commodity Credit Corporation
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSREES	Cooperative State Research, Education and Extension Service
EBI	Environmental Benefits Index
EFCRP	Emergency Forestry Conservation Reserve Program
FSA	Farm Service Agency of the USDA
FWP	Farmable Wetlands Program
IAD	Institutional analysis and development
NGO	Nongovernmental organization
NRCS	Natural Resource Conservation Service
TIP	Transitions Incentives Program
USDA	U.S. Department of Agriculture

Introduction

Farming is a vital component of food security in the United States; however, a balance must be struck between maximizing crop yield today and conserving farmland for environmental sustainability and use in the future. According to the U.S. Department of Agriculture, over 13 million acres (5 million hectares) of cropland have been lost to development in the last 30 years, and approximately 1.0 billion tons of agricultural soil is lost to erosion annually (USDA, 2013d). In an effort to combat these trends, the U.S. Congress created the Conservation Reserve Program (CRP) as part of the Food Security Act of 1985. Commonly called the farm bill, this legislation, along with CRP, is renewed and revised approximately every five to six years and remains in effect today. As one of the few voluntary, national government programs to focus specifically on long-term farmland conservation, CRP is an integral component of land preservation and environmental management in the U.S. Since the program is run using limited governmental funds, it is vital that CRP provide the maximum conservation benefits possible under the most cost-efficient structure.

To examine CRP and its effectiveness, we employed a theoretical framework to isolate the variables impacting policy, management, and implementation decisions. The institutional analysis and development (IAD) framework developed by Elinor Ostrom and her colleagues has been shown to be successful in analyzing ecosystem management programs (Imperial, 1999) and will direct this investigation. The IAD framework provides a method to identify the environmental, cultural, and institutional variables that affect the decisions made within an environmental management institution, and the resultant outcomes (Kiser & Ostrom, 1982). This framework can thus help to reveal strengths and weaknesses of CRP as an environmental management strategy, as well as provide transparency to the decision-making processes connected to the program by isolating the factors that influence policy decisions and outcomes.

The Institutional Analysis and Development Framework

The IAD framework was developed by Kiser and Ostrom (1982) to provide a means through which the complex decisions made by any particular institution could be broken down into components for analysis. The framework can then help researchers determine which specific factors influence decision-making behavior within the institution and the resulting outcomes (Kiser & Ostrom, 1982). This is especially useful when examining CRP, since the program is governed by a variety of agencies at differing levels of government and is participated in by farmers on a voluntary basis. Imperial (1999) argues that the IAD framework is particularly effective for ecosystem-based management systems because it addresses not only institutional rules, but also biophysical and cultural influences. Therefore it is an appropriate framework with which to analyze CRP, since the program involves the conservation of particular environments and requires the input of a specific subgroup of the population: farmers. The IAD framework also examines the impact of human behavior on the institution and vice versa, which is particularly important when dealing with programs that are designed to influence human behavior (Imperial, 1999), such as changing how a farmer uses a particular piece of land.

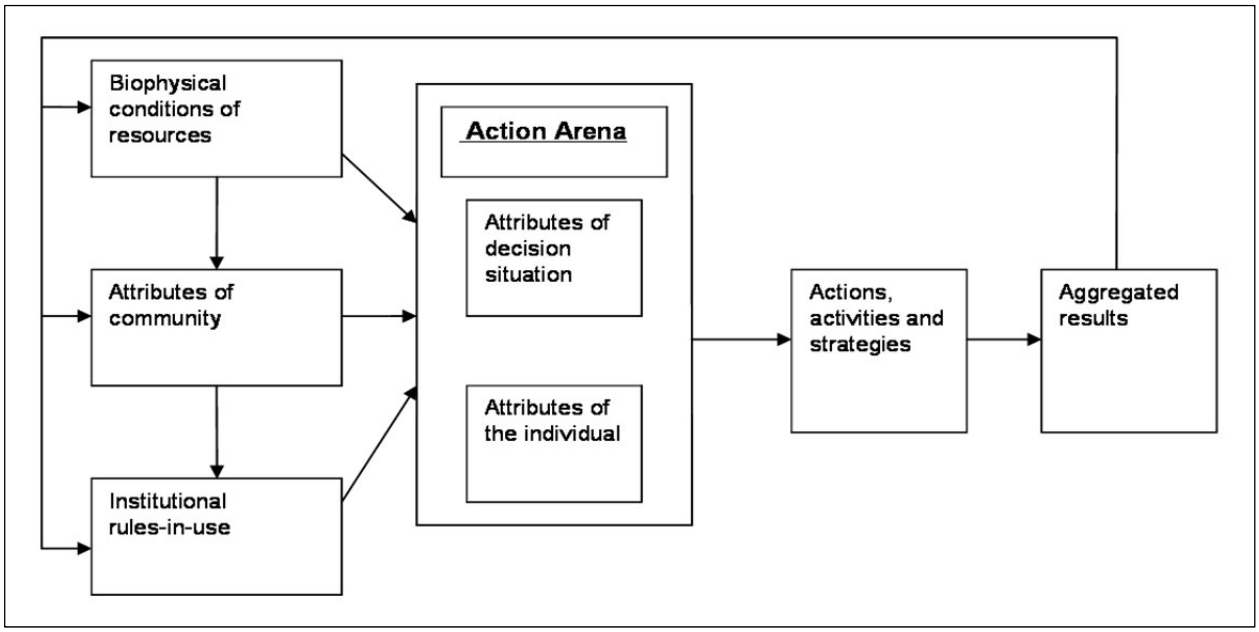
Concepts and Variables

The IAD framework outlines three external factors

that influence the decision-making process and outcomes of an institution (see Figure 1). The first is the biological and physical environment (Ostrom, Gardner, & Walker, 1994). This variable is particularly important when analyzing CRP since conservation decisions are made by Farm Service Agency (FSA) and Natural Resource Conservation Service (NRCS) officials according to specific environmental criteria (USDA, 2013a). Thus the biological and physical environment has a direct impact on which lands are selected for participation in the program. The second factor is the community, which includes all the individuals who are involved in and affected by the decisions made in the institution (Kiser & Ostrom, 1982). One significant aspect of the community variable of CRP is the agricultural community, including landowners and farm operators, which constitute a specific cultural group. Without collaboration from these key stakeholders the program would not exist. The final factor is the institutional rules and behavioral norms that affect decision-making (Kiser & Ostrom, 1982). These rules include formal policy rules, such as legislation implementing CRP, and informal rules, such as a typical method of interaction between agency employees and producers (Kiser & Ostrom, 1982). Again, without the financial, technical, and human resources established by institutional rules, CRP would not be viable.

These factors are then examined in the context of the "action arena," which is all the individuals who interact to make decisions that affect the outcomes of the institution (Ostrom, 2011). For CRP, the action arena includes producers who participate in the program, state and local officials who implement and enforce the program, private nongovernmental organizations (NGOs) that assist in implementation, and policy-makers who dictate the overarching rules. Decisions are made in the action arena, affected by the external variables, and ultimately generate outcomes (Kiser & Ostrom, 1982). The IAD framework can be used to both predict potential outcomes and evaluate measurable outcomes (Ostrom, 1999). Since the framework isolates the external variables and the connections between those variables and the outcomes, both the outcomes themselves and the processes that lead to those outcomes can be evaluated (Ostrom, 1999). Thus, the framework can be used to identify

Figure 1. Model of the Institutional Analysis and Development Framework



Adapted from *Rules, Games, and Common-Pool Resources,* by E. Ostrom, R. Gardner, & J. Walker, 1994, Ann Arbor, Michigan: The University of Michigan Press, p. 37. Copyright © 1994 by The University of Michigan Press.

strengths and weaknesses in the program, potential solutions for recurring problems, and methods to increase efficiency (Ostrom, 1999).

Methods

As stated, this study employs the IAD framework to examine CRP. To employ the framework, we collected information from research articles, government documents, and stakeholder accounts on the structure, implementation, and outcomes of CRP. We conducted ten interviews with key stakeholders associated with the program to gather information on the biophysical, cultural, and institutional factors affecting CRP. Interview participants were identified using a snowball sampling method, beginning with local governmental officials affiliated with CRP through positions in relevant agencies. At least one interview was conducted with an official at three levels of government: federal, state, and local. Agency officials interviewed were associated with FSA, NRCS, the Maryland Department of Agriculture, and University of Maryland Cooperative Extension. Some of these officials were tasked with operational activities associated with implementing the program, while others were more closely aligned with policy matters. We conducted additional interviews with producers who participate in CRP.

Interviews were conducted using an interview guide of 14 open-ended questions related to the IAD framework. Individual questions were operationalized to correlate to specific IAD variables. For example, respondents were asked how local biophysical conditions, community attributes, and institutional rules-in-use (rules that govern affiliated actors and actions) affect CRP implementation and outcomes in their region, as well as questions about the key actors and actions associated with the program. All but one of the interviews were conducted in person or over the phone, based on availability of the researchers and interviewees and geographical location. Each interview lasted approximately 30 minutes, and all interviews were conducted during March and April 2013. One interview was conducted via email due to time constraints on the part of the interviewee. All participants were informed of the purpose of the interview and consented to participate. Confidentiality of names and positions was guaranteed. Once the interviews were conducted and all relevant secondary research compiled, we then analyzed this information using the IAD framework according to the biophysical environment, community attributes, institutional rules, and program outcomes.

Results

Biophysical Environment

To be considered for CRP, land must be legally classified as capable of being planted, must be considered highly erodible, and must be located in a priority conservation area, or have been previously enrolled in CRP (USDA, 2013a). For general sign-up, the most common method of enrollment, lands are ranked based on six factors that make up what is called the Environmental Benefits Index (EBI): benefits the land can provide to wildlife, potential to improve water quality through soil retention and nutrient absorption, reduction of soil erosion, benefits that have the potential to last beyond the CRP contract, potential to improve air quality, and cost of renting the land (Hamilton, 2010; USDA, 2013a). The EBI was developed by FSA and NRCS. Producers with the highest scores on the EBI are deemed to have the most environmentally sensitive land that can support the most cost-effective conservation methods and are selected for enrollment (USDA, 2013a). These producers are then offered contracts to put their farmland into retirement for either 10 or 15 years, depending on their preference.

In contrast to the general sign-up process, the continuous sign-up process is targeted specifically to marginal and environmentally sensitive lands (USDA, 2006a). These lands meet certain environmental eligibility criteria determined by FSA as critically important to conserve (USDA, 2006a). Land eligibility requirements for continuous sign-up follow particular initiatives set by FSA that target specific environmental goals (Stubbs, 2013). These initiatives and FSA goals for each are listed in Table 1.

The biophysical environment plays a major role in on-the-ground implementation as well. NRCS technicians work with producers to identify

land that is less productive and environmentally sensitive, helping the producers to develop a conservation plan (USDA, 2012). While the producer ultimately decides what conservation practices will be used, the environment dictates which practices are most attractive. Factors that influence type of conservation also include soil erodibility, landscape, bodies of water, size of farm, type of farm, presence of animals, climate, species, and growing season (USDA, 2012). FSA additionally uses aerial maps to determine the most environmentally sensitive land, both on regional and individual farm scales (USDA, 2012).

CRP is designed to work in conjunction with federal, state, and local agricultural regulations and conservation programs. For example, in Maryland regulations were recently enacted to reduce nutrient runoff from agriculture. Producers will be able to enter land now required to be protected under Maryland law into CRP, gathering rental payments on the land and cost-share assistance for conservation measures taken on it. The combination of CRP with state and local government initiatives is exemplified by a subset of CRP, the Conservation Reserve Enhancement Program (CREP). Participants in CREP have to put into place specific conservation measures that address state conservation goals, according to plans drafted by state and federal officials (USDA, 2006b).

The biophysical environment affects not only the decisions and actions of the government agencies implementing the program, but also the decisions of participants. New technologies allow farmers to pinpoint which acres of land are producing profitable returns and which may not be worth expending the cost to plant and harvest. Interview respondents indicated that if farmers recognize certain acres as unprofitable, they might see CRP as a more economically lucrative option. This decision-making process is advantageous because the unprofitable areas of land are usually the lands most environmentally sensitive and in need of conservation. These examples show how the structure of the program is well suited to its purpose of altering the biophysical landscape and how it is also heavily influenced by the environment.

Community Attributes

The most significant cultural group for CRP is the producers. For the purposes of this study, a farmer can be defined as the operator of a farm. Several studies have analyzed attitudes of farmers toward conservation practices (Lynne & Rola, 1988; Lynne, Shonkwiler, & Rola, 1988; Reimer, Thompson, & Prokopy, 2012). In general, these studies have found that, while finances influence individual decisions to participate in conservation programs, attitudes toward conservation and sustainability also affect whether a farmer will choose to participate in a conservation program (Lynne &

Table 1. FSA CRP Initiatives and Acreage under Continuous, Non–Conservation Reserve Enhancement Program (CREP) Sign-Up

Initiatives	FSA Goal (Acres Enrolled Nationally)	First Year of Initiative	Total Acres Enrolled
Flood-plain wetlands	600,000	2004	231,607
Bottomland hardwood trees	250,000	2004	84,645
Non–flood plain and playa wetlands	350,000	2005	226,820
Upland bird habitat buffers	500,000	2005	241,851
Longleaf pine plantings	250,000	2007	116,909
Duck nesting habitat	300,000	2007	194,919
State acres for wildlife enhancement (SAFE)	1,250,000	2008	70,713
Highly erodible lands	750,000	2012	43,737
Pollinator habitat	100,000	2012	835

Note: 1 acre = 0.4 ha
Source: U.S. Department of Agriculture, 2013b.

Rola 1988; Lynne, Shonkwiler, & Rola, 1988; Reimer et al., 2012). These findings were supported by interviews with stakeholders in this study. Some observed that the money gained through participation in CRP was the primary motivation for producers to enroll land in the program. However, these respondents also indicated that farmers with conservationist views were quick to enroll in CRP for the environmental benefits it provided; others were more motivated by the funding the program provides, while still others would likely never participate in the program due to individual views concerning governmental authority.

Some research has been conducted specifically on the motivation of producers to enter land into CRP (Chang & Boisvert et al., 2009; Roberts & Lubowski, 2007). Chang and Boisvert (2009) found that specific factors influenced whether a producer decided to enroll land in CRP and how much land he or she enrolled. Interviews conducted with stakeholders in this study confirmed Chang & Boisvert's (2009) results that producers who were of retirement age were more likely to put entire fields into CRP rather than just sections of land. Additionally, producers who had careers outside of farming and/or had no intention of farming the land were more likely to put whole fields into CRP (Chang & Boisvert, 2009). Again this was supported through stakeholder interviews. Respondents in this study revealed that location of farms could have an effect on enrollment in CRP. Farmers in areas close to urban and suburban centers are less likely to enroll in CRP because there is potential that developers may buy the land at a higher price than could be offered by CRP.

How the community uses the land can also have an effect on whether land is enrolled in CRP and whether there is public resistance to the program. To produce large enough quantities of crops to be profitable, farmers may have to rent large tracts of land from multiple landowners. If a landowner chooses to place land in CRP, it reduces the amount of farmland available to rent and may reduce profits for tenants. According to interview participants, this has led to opposition to CRP by farmers, especially in the past when CRP focused on whole-field conservation. To alleviate this conflict, Congress and the USDA have enacted regulations to ensure that contracts between tenants and landowners are not broken by the landowners participating in CRP, and that tenants receive compensation for the loss of land.

Community preferences influence the way in which CRP is implemented. According to participants in this study, some communities have an abundance of classifiable agricultural land but few farms in the area. These communities may prefer to use that land for conservation purposes (Nelson, Uwasu, & Polasky, 2007). If there are certain environmental projects that are favored by the community, those projects can be targeted through CREP and the assistance of NGOs and state agencies. National public opinion and politics also influence the program. Changes to the program in 1990 reflected the desires of the public and of policymakers to make the program apply to additional environmental issues beyond only soil erosion (Hamilton, 2010). Interviews from this study also indicate that public opinion helps to keep CRP running.

The officials who implement the program are also a part of the community, as they decide which lands to enroll in CRP and which conservation measures will be used. Stakeholder interviews revealed that many of the officials working in the program feel a personal connection to the producers and the communities with which they work. Officials are highly motivated to provide producers with the maximum possible benefits and put in place effective conservation measures. They seek to improve environmental attributes of the state, while also improving the farmer's land. Stakeholders interviewed for this study described CRP as a program in which producers can take pride. It provides producers with the economic and technical opportunity to participate in conservation and contribute to the well-being of their state and county. Stakeholders interviewed in this study have observed an overall increasing acceptance among the public and the farming community for CRP.

Institutional Rules

The basic structure and purposes of CRP are set through the farm bill. Federal statute mandates that CRP is to be administered by FSA and rental payments made through the Commodity Credit

Corporation (CCC), a federal corporation operated under the USDA. The program is implemented through a number of federal, state, and local agencies (Food, Conservation, and Energy Act, 2008). FSA approves the conservation plans, and determines and pays rental and cost-share payments. NRCS (or other organizations approved by NRCS, such as the Cooperative State Research, Education and Extension Service (CSREES), employees of state agencies, or private conservation consultants) determines the conservation measures that can be taken on pieces of land (Food, Conservation, and Energy Act, 2008; USDA, 2006b) and assists the producer in building a conservation plan to submit to FSA (USDA, 2012). Federal statute also allows for the consultation of other agencies as necessary, such as state forestry and wildlife agencies and the U.S. Fish and Wildlife Service. Additionally, the statute sets many of the definitions that govern CRP, including specific biophysical characteristics, enforcement and implementation mechanisms, and economic terms.

The farm bill mandates that CRP be a voluntary program that producers can enter into and in return receive payment for the cost of renting the land, as well as up to half the cost of implementing conservation measures as determined by FSA and NRCS and approved by that county's conservation district. Federal statute limits CRP to 25 percent of agricultural land in each county. However, if FSA can show that having more than 25 percent of a county's agricultural land enrolled in CRP will not have a negative impact on the local economy, that limit can be waived (Food, Conservation, and Energy Act, 2008). Limits are also placed on what lands can be enrolled in CRP in order to ensure that agricultural land specifically is being targeted by the program (Food, Conservation, and Energy Act, 2008). The statute is flexible enough to allow FSA to determine which lands are the most environmentally sensitive and thus the highest priority for conservation, what conservation measures should be taken for land with particular attributes, and which lands should be eligible for continuous sign up. The statute additionally gives FSA the authority to determine acceptable uses and practices of the enrolled land, such as how often the land can be grazed. The federal statute outlines legal consequences of violating the laws under the program or presenting false information. Finally, the statute provides a means by which interested producers and tenants of farmland can be treated fairly under CRP.

CRP relies on interagency cooperation. Officials at the state and local level, usually employees with conservation districts, state research extension programs, or NRCS, explain conservation measures to producers and landowners, helping them to create a single conservation plan that includes national conservation measures, such as CRP and NRCS programs, as well as fulfills state conservation requirements (USDA, 2012). According to stakeholders interviewed at the state and local levels, one of the major goals of officials working with producers is to give the landowner the maximum financial benefit in accordance with the physical qualities of the land, state regulations, and preferences of the producer. Federal employees interviewed for this study were in agreement that often the most environmentally sensitive land (and thus land that ranks higher on the EBI) is unprofitable and/or must be conserved under state law. CRP provides a means through which the producer can conserve that land in fulfillment of state regulations, while still receiving payments for putting the land out of use and receiving a significant reduction in the cost of implementing the necessary conservation measures.

While the farm bill is only renewed every five to six years, the statute is broad enough to allow many of the specific elements of CRP to be regulated internally by the USDA. Therefore there are nearly constant minor policy changes to the CRP regulations. Stakeholders interviewed for this study indicated that most major policy changes (e.g., changes to federal statute or significant additions or subtractions to the program) are either political or economic in nature. Debates over the 2012 farm bill caused the passage of the bill to be delayed, with an extension of the 2008 farm bill passed in its place. This has halted the process for new enrollment in CRP. Economically, policy changes occur to reflect changes in the market price of commodities. Additionally the overall economic state of the country can affect the amount of money spent on agricultural conservation.

In general, CRP tends to correlate well with state priorities. FSA and NRCS officials consistently work with state agricultural, fish and wildlife, and forestry agencies to ensure that the conservation methods employed by producers with land enrolled in CRP are beneficial to the state's environmental priorities (USDA, 2012). For example, stakeholders described the input of state forestry agents in the program as vital to tree planting. FSA and NRCS officials interviewed for this study described how they have learned to work in conjunction with other agencies to ensure that there are few, if any, negative impacts resulting from the conservation practices taken as a part of CRP. Often officials with state agencies are the most knowledgeable of native species and how the ecosystem functions. This knowledge can be invaluable to implementing the program in a cost-effective and environmentally beneficial manner. Agency cooperation is furthered through the use of CREP and Farmable Wetlands Program (FWP) so that states can target funding to regional priorities (USDA, 2006b).

Outcomes

CRP has produced an abundance of environmental outcomes, as well as some social outcomes. Not all of these outcomes are easily measured or necessarily beneficial to the environment. According to the federal law that created CRP, the purpose of the program is to:

> Cost-effectively reduce water and wind erosion, protect the Nation's long-term capability to produce food and fiber, reduce sedimentation, improve water quality, create and enhance wildlife habitat, and other objectives including encouraging more permanent conservation practices and tree planting. (Food Security Act, 1985, § 1410.3, para. c)

Thus, if CRP is functioning in correlation with its legislative intent, these outcomes should result from the program, either directly or indirectly. The success of CRP is generally measured in acres of land conserved through the program, and then effects are extrapolated based on knowledge of how many acres are in conservation and which conservation measures are in practice (USDA, 2013a). Table 2 shows the number of acres enrolled in CRP.

Some outcomes of the program are more quantifiable than others. Reductions in soil erosion are definitively measurable, according to FSA officials. FSA can measure the soil erodibility of

Table 2. Land Enrolled in Conservation Reserve Program

Type of Contract	Number of Contracts	Number of Farms	Number of Acres	Annual Rental Payments (millions of US dollars)	Rental Payments (US dollars per acre)
General	291,191	194,915	21,521,915	$1,075	$49.94
Continuous:					
Non-CREP	320,142	192,158	3,883,539	$361	$91.00
CREP	73,624	48,548	1,272,055	$170	$133.51
FWP	15,595	12,089	340,728	$37	$109.90
Total Continuous	409,361	238,478	5,496,323	$568	$103.43
Total CRP	700,552	390,182	27,017,916	$1,643	$60.82

Source: U.S. Department of Agriculture, 2013b.
Note: 1 acre = 0.4 ha

land before and after conservation measures are implemented. Also, soil erodibility of the land is a component of EBI, meaning the producer is required to collect and provide that information prior to implementing conservation measures (USDA, 2013c).

One of the major issues with measuring success of the program is a lack of baseline data, which NRCS does not have either the authority or resources to collect. For example, the improvement of a stream's water quality cannot be measured if there is no original data to compare to the present day. Additionally, some environmental benefits are very difficult to quantify and to attribute to a single program or conservation effort (Giudice & Haroldson, 2007). Despite widespread claims that CRP increases populations of bird species, Giudice and Haroldson (2007) showed that such claims are difficult to scientifically measure and verify. Some conservation measures have little to no effect for years, or even decades. Planting trees, for example, requires many years before environmental benefits can be observed. While one of the major goals of CRP is cost-effectiveness, this is almost impossible to measure since many of the environmental benefits alone cannot be measured adequately (Giudice & Haroldson, 2007). Therefore, it is difficult to prove that all of the governmental funds supporting the program are worth the outcomes.

Several studies have been conducted to measure the success of wildlife management in the program (Dunn,, Stearns, Guntenspergen, & Sharpe, 1993; Giudice & Haroldson, 2007; Matthews, Taylor, & Powell, 2012; Negus, Davis, & Wessel, 2010; Swanson, Scott, &, Risley, 1999). Agency officials keep track of this data and sometimes help fund the research. CRP land has been shown to increase biodiversity, decrease habitat fragmentation, and provide carbon sequestration (Dunn et al., 1993). The program has also increased the number of wetlands (Table 1), and stakeholders have observed increases in certain bird populations, particularly pheasants.

While CRP has numerous environmental benefits, there are some unintended negative effects on the environment and to farmers. One negative effect is the opportunity for invasive species to populate CRP land and spread further. Stakeholders interviewed for this study indicated this is a problem because the land is being cleared and invasive species which may not be able to outcompete crops are sometimes able to outcompete native species planted for conservation. Another unintended effect identified by local officials working with CRP interviewed for this study is that pollen and seeds from CRP land are sometimes transported by wind to nearby land that is being used as cropland, interfering with production of that land. A further consequence local officials and landowners observe is an increased presence of deer because CRP lands often are a suitable habitat for them, especially in areas with tall, warm-weather grasses that are a highly desirable for raising young. Deer pose a significant problem because they can damage crops, cause car accidents, and overgraze native plants. FSA has made considerable effort to try to reduce these negative effects by implementing adaptive conservation strategies and practices (USDA, 2012). However, further standards for maintaining and implementing conservation practices over the lifetime of the contracts could significantly improve environmental outcomes (Giudice & Haroldson 2007; Matthews et al., 2012; Negus et al., 2010; Osborne, Sparling, & Hopkins, 2012; Risley et al., 1999).

Discussion

Biophysical Environment

The biophysical environment has an enormous effect on decision-making concerning CRP at all levels of government. Environmental criteria are key to enrollment of land into CRP (USDA, 2013a). The use of the EBI for participation in CRP through general sign-up is a competitive process, based primarily on environmental aspects of the land (USDA, 2013c). The EBI process has been shown to be useful in targeting environmentally sensitive lands that can provide substantial environmental outcomes (Ribaudo, Hoag, Smith, & Heimlich, 2001). FSA changes the requirements for EBI each year, and the point values assigned vary by state and sometimes by county (USDA, 2013c). This flexibility maintains the purposes of the program by ensuring that environmental issues that vary by geographical area and over time will be

taken into proper consideration. This maximizes the use of conservation practices and helps to ensure that the most environmentally sensitive agricultural land is placed into CRP. EBI has resulted in CRP accomplishing a wider variety of conservation goals (Ribaudo et al., 2001).

The CREP, FWP, Emergency Forestry Conservation Reserve Program (EFCRP), and Transitions Incentives Program (TIP) are all additions to the original CRP that have not only increased environmental benefits but also have allowed those benefits to focus on specific areas of environmental concern (USDA, 2006b). CREP in particular has allowed land conservation in the program to focus on regional environmental problems (USDA, 2006b). This seems to be very beneficial to a national ecosystem management program. While some regions are well suited for CRP and whole-field conservation, the environment of other regions necessitates the use of specific environmental practices to help resolve significant environmental issues in those areas (USDA, 2013b). In some areas, without the addition of these programs it is likely that much less land would be enrolled in CRP today (USDA, 2013b). In Maryland, for example, local officials interviewed for this study observed that most of the land is under CREP, with existing CRP contracts being relatively old and likely to switch to CREP when they are up for renewal. These results can be attributed to higher land rental payments provided by CREP, since the Chesapeake Bay constitutes a conservation priority area (USDA, 2013b). Additionally, CREP works well in conjunction with state regulations and provides producers with a greater economic benefit than enrolling in general sign-up CRP (USDA, 2013b).

The FSA has attempted to reduce potential negative environmental outcomes of the program; it has made minor changes through internal policy and has made larger changes through the farm bill. NRCS and FSA are instructed to work closely with state and local governmental agencies, NGOs, and other local organizations to provide conservation measures that will be the most environmentally beneficial overall (USDA, 2012). FSA also has put regulations into place that specify management practices that must be undertaken for certain environments and conservation choices (USDA, 2012). For example, plants that spread quickly and easily have maintenance requirements to prevent their spread to nearby land (USDA, 2012). The FSA continues to incorporate many regulations like this by learning what measures work best in different environments and provide the most environmental and economic benefits (USDA, 2012).

Community Attributes

FSA has done a remarkable job in structuring and adjusting CRP to fit the agricultural community. First, the program is voluntary. Thus, it can be framed as the producer choosing to enact conservation practices to better the land and improve environmental quality for others. The voluntary basis of the program seems to reduce the feelings of resentment that may accompany mandatory conservation regulations. The producer also experiences some freedom in choosing the conservation methods, according to stakeholders interviewed for this study. NRCS officials take the producer's preferences into consideration as much as possible when designing a conservation plan and often generate multiple cost proposals for implementing conservation practices. One participant recognized the importance of this freedom, noting that it maintains the farmer's ability to control the environment. These methods also allow for social outcomes, such as the opportunity for hunting and the aesthetic value of the conserved land.

The FSA and NRCS officials working with the producer are usually assigned projects at the county level, and often live in the same counties as the producers themselves. This adds a degree of personal influence. The producer usually relies on NRCS officials to come up with a conservation plan, trusting that these officials know the many state and federal agricultural regulations. FSA and NRCS officials interviewed for this study indicated that most participants in the program sign up on the advice on NRCS technicians and noted that this personal interaction is more useful than outreach methods in drawing participation. This outcome suggests that NRCS perhaps should focus more on building community trust with the agency in order to gain more participants, a strategy that has been employed to improve environmental

governance in other settings (see Ostrom, 2005).

CRP has adjusted well to criticism from a variety of groups and interests. When the program was first initiated in 1985, it quickly received criticism that it was not cost-effective (U.S. General Accounting Office, 1989) and did not address enough environmental issues (Young, Bechtel, & Coupal, 1994; Dunn et al., 1993; Reichelderfer & Boggess, 1988). In response, CRP was modified to reflect a wider variety of environmental concerns, including habitat enhancement and water quality (USDA, 2013a). During the start of the program, tenants were concerned about losing profits from large tracts of land if landowners put whole fields into CRP. USDA responded by created mandates that ensure tenants are treated fairly and are compensated (USDA, 2012). Also, regulations on management have become more strict and specific to improve the effectiveness of these measures and prevent them from interfering with agricultural production elsewhere.

Institutional Rules

Policy decisions regarding CRP seem to be least effective at the federal level. The national political climate has led to reductions and delays in CRP. Congress extended the 2008 farm bill because an agreement could not be reached over the proposed 2012 farm bill. This extension has halted the enrollment process from many prospective CRP participants, causing stress to producers and a delay in implementing important conservation measures. Although the national structure of the program is helpful in ensuring benefits across the country, there are also delays. Every five to six years there is concern that funding and maximum acreage will be reduced again or that the program will be cut altogether.

FSA and NRCS implementers are efficient, well-coordinated, and constantly seeking to improve the program. FSA and NRCS officials interviewed for this study demonstrated appreciation for other agencies involved in the program and appeared to have well established connections at all levels of government. This seems to be a major benefit of the program, in that producers are receiving conservation plans that incorporate the goals of national, state, and local agencies in a cost-effective manner. Participants in this study view CRP as a great example of interagency cooperation, and there seem to be few to no conflicts between various agencies. In general, all the agencies involved have similar goals of helping the producer and improving the environment.

Conclusion

This study provides a unique contribution to the literature on farmland conservation by considering the institutional capacity of CRP. The ability of producers enrolled in CRP to conserve land is often influenced by external variables, including local biophysical conditions, local community attributes, and local, state, and federal institutional rules. We hope these findings will help to inform producers and farmland conservation practitioners about how these variables affect decision-making and resource allocation within CRP, and ultimately facilitate the enrollment of additional lands in CRP.

The structure of CRP is well suited to its purpose and appears to function according to congressional intent as mandated by the farm bill. Biophysical characteristics of the land are the major determinants for involvement in the program and the types of conservation practices that are enacted. The regulations on these characteristics are flexible enough to account for cultural variation as well as changes across time and space. Although there are some unintentional negative environmental outcomes, CRP places millions of acres of land into conservation each year, removing unproductive and unused land and repurposing it to benefit the environment and society. Producer attitudes are growing increasingly accepting of conservation programs, and involvement in CRP can be a source of pride for producers. FSA has structured the program in a way that appeals to producers and at times can help them to accomplish state and local conservation goals at a reduced cost or at no cost to the producers with additional financial assistance from the state. Although the national policy aspects of CRP appear ineffective, the program is implemented according to institutional rules that allow many groups to participate and work together to accomplish similar goals. Even though some of the environmental benefits of CRP are difficult to quantify, the observable outcomes fulfill the policy

goals outlined by federal law and by FSA.

This study implicates that the CRP is a well functioning program that could use some improvements, especially in gathering baseline data and preventing unintended negative outcomes. However, the program demonstrates effective cooperation between various agencies and has changed over time to suit current conservation practices and needs. Continuation of the program is likely, and based on past history and current practices CRP will likely improve over time, continuing to maximize environmental outcomes and benefit agricultural producers.

While this study improves our understanding of CRP implementation and outcomes, it is not without its limitations. The small sample size and regional focus of interview participants mean that our findings cannot be considered representative of all key stakeholders associated with CRP, thus raising questions about the study's generalizability to a broader population. Furthermore, a larger N would result in more empirical data to inform the results and discussion. Looking forward, future research on this project could employ the full IAD framework, which also includes how external factors influence decisions at three levels of choice (Kiser & Ostrom, 1982). Additionally, first-hand observation of CRP in action, such as shadowing an NRCS or FSA employee, would provide deeper insights into its institutional processes.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Rural development strategies and government roles in the development of farmers' cooperatives in China

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Submitted August 1, 2013 / Revised November 18, 2013, and February 24, March 25, June 13, and July 3, 2014 / Accepted June 13, 2014 / Published online September 8, 2014

Citation: Chen, A., & Scott, S. (2014). Rural development strategies and government roles in the development of farmers' cooperatives in China. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 35–55. http://dx.doi.org/10.5304/jafscd.2014.044.005

Abstract

In an effort to address the growing income disparities between rural and urban residents in China, Chinese authorities introduced a series of rural development policies beginning in 2002 that established as a national goal a *xiaokang* (all around better off) society and gave top priority to the triad of agriculture, rural areas, and farmers. Farmers' cooperatives, consequently, have received substantial government support since 2002 as they are viewed as an important institution for linking small-scale producers to agro-food supply chains, and particularly value-added food chains. Yet little is understood regarding how and to what extent farmers' cooperatives have benefited members and contributed to rural development in China. Using a case study method and in-depth interviews, we evaluated three successful farmers' cooperatives in China. Following the "deepening-broadening-regrounding" typology proposed by van der Ploeg, Long, and Banks (2002), we found that the farmers' professional cooperatives can make important economic, social, and environmental contributions to rural development by adopting alternative strategies and activities. On the other hand, these cooperatives also face great challenges for further development, including limited access to land and capital, a massive loss of laborers, low market competitiveness, weak internal management, and limited government support, which explains why cooperatives are not more widespread in China. This paper offers new insights into the roles of farmers' cooperatives and government in rural development.

Keywords

China, ecological agriculture, farmers' professional cooperatives, sustainable rural development

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Introduction

Under the agro-industrial paradigm, agricultural producers face a reduction in economic margins as a result of the cost-price squeeze (van der Ploeg, 2000). Small-scale farmers in developing countries face numerous challenges in connecting to agricultural services and in accessing markets, especially value-added markets (Barrett, 2008; Kruijssen, Keizer, & Giuliani, 2009). By working collectively, farmers' cooperatives can significantly reduce transaction costs and increase the bargaining power of farmers in the supply chain (Bosc, Eychenne, Hussein, Losch, Mercoiret, Rondot, & Mackintosh-Walker, 2002). Compared with the capitalist agribusiness model, this model has the potential to be more inclusive of the most resource-poor, small-scale farmers (Kruijssen et al., 2009). Kirschenmann, Stevenson, Buttel, Lyson, and Duffy (2008) view this model as "an encouraging trend with real benefits to the local communities" (p. 3).

Farmers' professional cooperatives (FPCs) have grown rapidly in rural China over the past 10 years. They have become an important institution in rural China in attempting to achieve the vertical integration of agricultural production, processing, and marketing. However, findings about FPCs are controversial. Realizing the potential to combine capitalist and socialist components, Huang (2011) advocates FPCs as alternatives to large agribusiness companies for integrating small-scale farms with processing and marketing, and predicts that FPCs could outcompete agribusiness if they were given the same state subsidies and privileges. Others suggest that FPCs would likely be transformed into capitalist agribusiness and be cooperatives in name only if farmers could not sustain anticapitalist political mobilization (Hale, 2013; Lammer, 2012). Gürel (2014) further points out that many FPCs in contemporary China are company-like cooperatives that are similar to agribusiness in terms of their "shareholding and decision making structures and the production relations they facilitate" (p. 69).

These critiques tend to apply only to coops established by enterprises. Rather than continuing the debate on "true" and "fake" cooperatives, we argue that FPCs — particularly the subset of cooperatives that are not merely extensions of agro-enterprises — have the potential to make significant social, economic, and environmental contributions to rural development in China by adopting the "deepening-broadening-regrounding" framework proposed by van der Ploeg, Long, and Banks (2002). In this study we analyze how new entrepreneurial and innovative strategies are pursued, what roles are played by the Chinese government in the establishment and operation of FPCs, and what roles are played by different farm members and their participation in decision-making and profit-sharing. Finally, we analyze the main contributions to rural development and the development challenges of FPCs.

This paper is structured as follows. We first present the research framework adopted in this study to analyze the convergence of farmers' cooperatives to rural development. Next, we introduce the methods used in data collection and analysis for this study. Then we provide a brief overview of FPC development in China. We then introduce three cases of FPCs and highlight the government's role in promoting FPCs. Finally, we analyze the contributions of FPCs and the challenges they face.

Convergence of Farmers' Cooperatives and Sustainable Rural Development

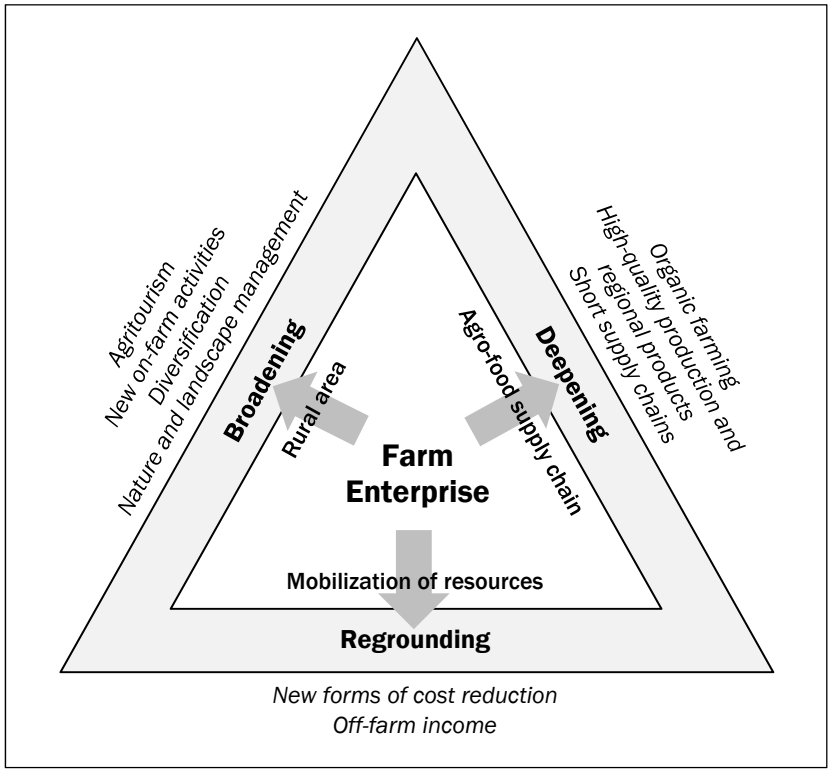
Based largely on Europe's experience, Terry Marsden (2003) identifies three distinct agrarian production paradigms that link rural development to sustainable development: the "agro-industry paradigm," the "post-productivist paradigm," and the "sustainable rural development paradigm." These three paradigms differ in internal logic, ideology, scientific rationality, and regulatory arrangement (Marsden, Banks, & Bristow, 2002). The agro-industrial paradigm, following the logic of neoclassical economics, promotes specialization and economies of scale. The post-productivist paradigm is based on the belief that the agricultural sector (in developed economies) is being marginalized through a move away from food production and toward the "consumption" of the countryside (Marsden, Murdoch, Lowe, Munton, & Flynn, 1993). Marsden (2003) argues that both of these two development paradigms are unsustainable.

In contrast to these two paradigms, the new sustainable rural development paradigm redefines our relationship with nature by highlighting the

multifunctionality of agriculture and works toward an alternative food supply chain to counter the scale and price rationalities of large-scale agribusiness (Marsden et al., 2002). The rural development paradigm explores opportunities in the agricultural sector related to resource use, livelihood strategies, and institutional arrangements. This paradigm reasserts land-based agricultural production as a central dimension in achieving rural sustainability and highlights the crucial roles of farmers and farmers' cooperatives in revitalizing the rural economy (van der Ploeg et al., 2000; Marsden et al., 2002). It emphasizes the ability and skills of famers and PFCs to generate different economic values from the same ecological resource through co-production, cooperation and co-evolution of the resource base (Marsden, 2009). The multifunctional role of agriculture in meeting new social and environmental demands is underlined in this paradigm (Renting et al., 2009; van der Ploeg, Laurent, Blondeau, & Bonnafous, 2009).

Although the rural development paradigm has been widely used, there is no comprehensive and agreed upon definition of it (van der Ploeg, 2000). Part of the debate concerns the role and categorization of rural development activities. To identify an activity as a "rural development activity," Marsden, Banks, and Bristow (2002) postulate that the aggregated effect of this activity must meet the following three conditions: (1) it is a response to the cost-price squeeze on agriculture and adds income (and/or employment opportunities) to the agricultural sector; (2) it corresponds to the needs and expectations of the population and expresses new relationships between the agricultural sector and society; and (3) it implies a redefinition, recombination, and/or reorganization of rural resources and develops new businesses and/or opportunities within rural society. The diversified activities can take place on-farm and/or within the local economy, either within the scope of agriculture or outside of it (van der Ploeg et al, 2002). Beyond the production of raw materials, alternative activities include landscape management, agritourism, innovative forms of cost reduction, production of high quality and region-specific products, direct marketing, and new activities such as care activities for the disabled (Darnhofer, 2005, p. 309).

Figure 1. Boundary Shifts: The "Deepening-Broadening-Regrounding" Typology



Source: Van der Ploeg, Long, & Banks, 2002, as cited in Van der Ploeg et al., 2012, p. 134.

Van der Ploeg et al. (2002) propose a typology of alternative farming strategies to categorize diversified rural development activities: "deepening," "broadening," and "regrounding" (see Figure 1). A *deepening* strategy refers to activities that add value to products by means of processing or by focusing on "quality" production (such as organic) or shortening the food supply chain. A *broadening* strategy refers to activities that diversify nonagricultural activities based on rural resources, such as agritourism and landscape con-

servation. A *regrounding* strategy refers to activities that reorganize farm resources mainly through reallocating family labor, reutilizing farm resources, or adopting various forms of local and regional cooperation and/or collaboration to achieve cost reductions.

To better accommodate the situation in China, we adopt this typology in the current study with two slight modifications: (1) we consider green, hazard-free,[1] and organic agriculture as ecological agriculture under the category of deepening strategy in this paper (see Scott, Si, Schumilas, & Chen, 2014, for the differences between organic, green, and hazard-free certification); and (2) we do not consider off-farm income to be a regrounding strategy for FPCs. Part-time farming is a common phenomenon in rural China, so it should not be viewed as an alternative farming activity. Moreover, the effects of part-time farming on rural development in China are contradictory, as we explain later in this paper.

The deepening-broadening-regrounding typology provides an analytical framework for describing and assessing agricultural multifunctionality and rural sustainability. Beyond producing food and fiber, and providing employment and income, agriculture is considered to be one of the most common multifunctional activities, which also produces other commodities (such as agritourism and other services) and noncommodity outputs (such as landscape management, soil conservation, and biodiversity) (Durand & van Huylenbroeck, 2003; Renting et al., 2009). With a few exceptions (van der Ploeg, Jingzhong, & Schneider, 2012), this framework has been applied to date mainly within EU rural-development contexts (see for example Ortiz-Miranda, Moreno-Pérez, & Moragues-Faus, 2010).

Rural development research often starts at the farm or farm household levels, although it is also valuable to conduct studies at the regional level in order to examine connections to rural life more widely and to other (economic) actors operating in the countryside (Knickel & Renting, 2000). The farmers' cooperative model provides an important lens to analyze rural development at the regional level, although to date this model has received little attention in rural development research (Ortiz-Miranda et al., 2010). Following the deepening-broadening-regrounding typology, we examine the potential contributions of FPCs to agricultural multifunctionality and rural development in China.

Research Methods

The research was designed as a multiple case study (Yin, 2003), consisting of three cases of cooperatives involved in China's ecological and organic agriculture sector. Each of these three — Daizhuang Organic Farmers' Professional Cooperative in Jiangsu province, Tonglu Peach FPC in Zhejiang province, and Yuexi Organic Kiwifruit FPC in Anhui province — represents an FPC initiated and established by different types of internal or external actors. The cooperatives that we selected reflect the following three criteria:

(1) They all follow the principles stated in the Farmers' Professional Cooperative Law,[2] although all three FPCs existed before the law was enacted.
(2) The cooperatives were initiated and established differently: by large-scale farms, by agro-industries, and by other external actors (such as researchers, government agents, foreign donors, and nongovernmental organizations [NGOs]).[3]

[1] Given the fact that GMO and certain types of pesticides and fertilizers are allowed in production, green and hazard-free production practices would not be considered as ecological agriculture in a European or North American context. We categorize green and hazard-free production practices under "ecological agriculture" sector in this paper because they have a tendency toward reducing ecological impact by limiting the usage of agro-chemicals (in terms of both amounts and types) compared with conventional farming practices in China.

[2] According to the Farmers' Professional Cooperative Law, implemented in 2007, FPCs should follow five principles: (1) farmers play the dominant role in the cooperative; (2) the key purpose is to serve members and act in the common interests of all members; (3) the members shall join and exit voluntarily; (4) all members are equal and cooperatives are democratically controlled; and (5) surplus should be redistributed based on the volume of members' patronage (National People's Congress [NPC], 2006: article 3, chapter 1, paragraph 4).

[3] Cooperatives initiated by agro-enterprises are not included in this study because agro-enterprises are mainly driven by profit maximization rather than a rural development goal. Clegg

(3) They all adopt "alternative" farming strategies and have been relatively successful economically.

We chose to focus on successful cases to better understand the contributions of cooperatives to rural development. Moreover, we selected cases adopting "alternative" farming strategies in order to demonstrate the kinds of new opportunities that are emerging for farmers' cooperatives based on the growing demand for high quality and organic food, especially in China's domestic market (Si, Schumilas, & Scott, in press). We recognize, however, that most cooperatives in China are still oriented to conventional agricultural production.

Both primary and secondary data were used in this study. Primary data were collected through face-to-face semistructured interviews. Over 20 interviews were conducted between 2010 and 2012.[4] Interviewees were selected using purposive sampling and included the cooperative initiators, cooperative leaders, cooperative members, and organic certification agencies, as well as other key actors such as representatives from local institutions and government agencies. At least four interviews focused specifically on each of the FPC cases, including one with each cooperative leader. All interviews were conducted in person and took on average 60 minutes to complete. Interviews were conducted in Chinese, and notes were written in Chinese during each interview and translated into English later. In addition to this interview data, we also reviewed secondary sources in this study, including government reports, project reports of organic agricultural development in less-developed regions, and cooperative documents of Tonglu and Daizhuang FPCs. NVivo, a qualitative data analysis computer software package for working with textual data, was used to code and inductively categorize data into themes.

The Development of Farmers' Cooperatives in China

Internationally, cooperatives have been a central institution in social development, poverty alleviation, employment creation, and participatory development (United Nations, 2001). The cooperative model is defined by the International Co-operative Alliance (ICA) as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through jointly-owned and democratically-controlled enterprise" (n.d., para. 1). Cooperatives can deliver pro-poor growth in a manner that is owned and controlled by poor and small-scale farmers themselves (Clegg, 2006). Nevertheless, farmers' cooperatives in developing countries face many challenges due to the lack of capital and business management capacity (Birchall, 2004).

The development of farmers' cooperatives since the establishment of the People's Republic of China in 1949 can be divided into three phases: from 1949 to the early 1980s, the early 1980s to 2007, and 2007 to the present. Since 1949, agrarian institutions have changed from agricultural "collectives" or people's communes in the Mao era[5] to family farming and then to FPCs (Jia, Hu, Hendrikse, & Huang 2010). The unsuccessful experience of agricultural collectives during the Maoist period became an obstacle to developing farmers' cooperatives in the following decades. The level of trust among people — an important basis for cooperation — was eroded in many systems of collectivization due to centralized decision-making that left little or no room for civil society initiatives and social organizations (Paldam & Svendsen, 2002). Subsequent challenges have been reported

(2006) found that the agro-industrial–oriented model in China leads to the monopolization of benefits by wealthy farmer-investors and outside shareholders at the expense of small-scale farms. Moreover, this model does not address the disadvantaged position of small-scale farms in decision-making and in the distribution of earnings (see Yan & Chen, 2013, regarding the intellectual debate over rural cooperatives in China).

[4] This is part of a larger project on "Greening China's food system: The emerging alternative and ecological agriculture sector" that has involved 106 interviews with six types of key stakeholders.

[5] We use the phrase "collective" here to refer to the type of collective action with the purpose to overcome barriers faced by individual farms. Although in the Chinese literature "collective" is sometimes translated into English as "cooperative," we recognize that "collective farms" in the Mao era would not be considered cooperatives today. The "collectives" in the Mao era did not meet the criteria of cooperatives, such as being voluntary to join or withdraw.

in some post-socialist countries with (re)establishing farmers' cooperatives (see Paldam & Svendsen, 2002; Tisenkopfs, Kovách, Lošťák, & Šūmane, 2010). Agricultural collectives in China stagnated between the 1960s and early 1980s. Cooperatives began to emerge, particularly in the fruit and vegetable sectors (Garnevska, Liu, & Shadbolt, 2011), in the late 1980s, with the shift from central planning to market orientation in the agricultural economy (Xiaoshan, 1999). These cooperatives mainly involved pre- and post-farm production activities in relation to purchasing farm inputs, processing, and marketing (Clegg, 2006).

Experiences of the "East Asia development model" in Japan, South Korea, and Taiwan indicate that rural development often garners more attention when the industrialization and urbanization of a country reach a certain phase. To build a stronger rural community and improve the living conditions of rural households, community-based rural development initiatives, especially farmers' cooperatives, have been promoted in these countries through policy support (Choi, Kim, Kim, & Kim, 2007; Long, Liu, Li, & Chen, 2010). Scholars argue that China reached a turning point for rural development in the 2000s in terms of per capita gross domestic product (GDP), which was US$1090 in 2003 (Long et al., 2010). The fast-growing economy and stronger international standing mean that China is in a position to broaden its development strategy and provide more support to agricultural and rural development. China can learn from South Korean and Japanese experiences and build a new countryside by establishing farmers' cooperatives to encourage local participation (Long et al., 2010).

The first national Farmers' Professional Cooperative Law was implemented in 2007 to formalize and standardize FPCs in China. The law stipulates that FPCs must be voluntarily and democratically organized and remain independent in operation. Having FPCs controlled democratically by farmers sets them apart from the previous agricultural collectives of the socialist era, in which the supplying of farming inputs and producing and selling activities were all centrally planned by government (Hu, Reardon, Rozelle, Timmer, & Wang, 2004). The stable legal environment together with various supportive government policies has created a favorable political and economic environment for developing FPCs in China. As a result, the number of FPCs has been increasing rapidly since 2007 (see Table 1). However, most FPCs are criticized for being "fake" cooperatives that are controlled by a small group of members and fail to empower small producers in practice (Yan & Chen, 2013). The "fake" cooperatives, mainly those initiated by agro-enterprises, are different from the types that we examine in this study. Meanwhile, cooperation among FPCs across multiple townships is also developing in China; this increases their market power and provides more services for farm members (Garnevska, Liu, & Shadbolt, 2011).

The main activities defined in the law include purchasing agricultural inputs, marketing, processing, transportation, storage, and providing agricultural technology and information. Learning from the experience of "comprehensive cooperation" in Japan, South Korea, and Taiwan, many Chinese rural development advocates and intellectuals (e.g., Wen Tiejun and Li Changping) also highlight the values of FPCs in empowering rural areas and small producers rather than focusing only on commodity production (Yan & Chen, 2013). In situations where farmers are poorly educated, lack

Table 1. Farmers' Cooperatives Registered at the Bureaus of Industry and Commerce in China, 2007–2012

	Number of registered farmers' cooperatives	Number of registered members	Registered capital (millions of US$[a])
2007	26,400	350,000	5,074
2008	110,900	1,417,100	14,329
2009	246,400	3,917,400	40,070
2010	379,100	7,155,700	74,002
2011	521,700	11,964,300	117,950
2012	689,000	n/a	179,072

[a] One US$ was valued at 6.14 Chinese Yuan (Renminbi or RMB) as of August 2014.
Source: Fleischer, 2012, p. 24; data from Ministry of Industry and Commence, and the General Station of Administration on Rural Cooperative Economy, Ministry of Agriculture.

cooperative management experience, and have limited access to legal advice, intellectuals who advocate for rural development have called on the Chinese government (at both national and local levels) to play a stronger role in promoting and organizing FPCs (Yang & Wen, 2011). With the strong support that the Chinese government has been giving to large-scale agribusiness enterprises, also called "dragon-head enterprises,"[6] since the mid-1990s, the capacity of cooperatives has suffered (Wen & Dong, 2010). Yang and Wen (2011) call for stronger government support for developing cooperatives that "ensure fairness and protect the disadvantaged" and "represent integrative and long-term social interests" (p. 45).

The development of FPCs in different parts of China has been quite uneven. Cooperatives are developing rapidly in eastern China, where the economy and markets are more developed and agriculture is more industrialized, whereas cooperatives in less industrialized western China are still in the early stages of development (Liang & Hendrikse, 2013). Zhejiang is a pioneering province in eastern China where the first modern farmers' cooperatives in China were established. Zhejiang takes the lead in the development of farmers' cooperatives in China, both in terms of the total number of FPCs and their economic performance (Liang & Hendrikse, 2013; Sultan & Larsén, 2011). It was also a leading province in enacting the provincial cooperative law and regulations in 2005, providing the basis for the national law[7] promulgated on July 1, 2007.

In the following section, we outline three case studies that exemplify successful examples of developing economies of scope in FPCs to achieve agrarian-based forms of rural development. We begin by highlighting the socio-economic context of each case. The practices and strategies pursued by the three FPCs are analyzed according to deepening, broadening, and regrounding strategies. We also examine the role played by the Chinese government in promoting cooperatives.

Findings

Cooperative Profiles

Daizhuang Organic FPC: Daizhuang village, south of Jurong city in Jiangsu province, is situated on hilly land with 1,040 hectares or 2,570 acres (approximately 666.7 hectares or 1,648 acres of farmland, 60 percent of which is hilly-slope land) and a population of 2,900 (around 866 households). At the time of establishing the cooperative, it was the poorest village within Zhenjiang City, despite boasting rich natural resources. Before the establishment of the Daizhuang Organic FPC, conventional crops, including wheat and rice, were produced. After a comprehensive study, a senior researcher, Mr. Zhao at the Institute of Zhenjiang Agricultural Technology & Science (IZATS), facilitated the establishment of this cooperative in 2006. Since that time, Mr. Zhao has continued to serve as an on-site technical consultant, and the village secretary has served as the cooperative leader,[8] attending to the daily management of activities in the cooperative. Daizhuang Organic FPC was the first organic farmers' cooperative in Jiangsu province. Its main products are organic rice and strawberries. Products are sold through various channels, including direct sale to companies[9] (60 percent of sales), to individuals (20 to 30 percent), through its own specialty stores locally, and via agencies in large cities. Home delivery was offered in 2007 and 2008 but was discontinued due to the high cost. Given the small volume of production, this cooperative faces challenges in supplying a large food retailer.[10]

[6] Dragon-head enterprises are "clustered groups to which state capital can be channeled and state preferential treatment provided" (Chan, 2009, p. 46).

[7] In China, provinces or municipalities are allowed and selected (in some cases) to experiment with new projects or strategies in a given area, and then the state learns from this and the experience shapes the national law. This differs from the procedure in many other countries, where a law is enacted and then people follow it in a much more linear system than in China (also see van der Ploeg et al., 2012).

[8] Given that many young people have migrated to urban areas for better job opportunities, secretaries are often the ones with a better education and stronger ability than others in rural areas.

[9] In China, it is common for an employer to purchase gifts for employees or clients on special occasions throughout the year.

[10] The large retailer refers in particular to Beijing Organic and

Tonglu Peach FPC: Yangsanfan village, in the northern part of Tonglu county, in Zhejiang province, is situated in a mountainous area with 519 hectares or 1,282 acres (approximately 74 ha or 183 acres of farmland and 155 ha or 383 acres of forest land) and a population of 861 (285 households). Peaches have been grown in this area for approximately 170 years. Compared to other areas in China, rural communities in Zhejiang province are wealthier and farmers have greater entrepreneurial skills. The per capita income in this village was around US$2,000 in 2008. With the support of local government agencies, the Tonglu Peach FPC was initiated in 2004 by a few local "large-scale" peach farmers,[11] which is the first farmers' cooperative in Tonglu county. Mr. Wang, one local large-scale peach farmer, has acted as the elected cooperative leader since its founding. He is high-school educated and is active in marketing and establishing social networks. Peaches and cherries are the main products of this cooperative. Peaches are sorted into two grades: first-class peaches are gift packaged and are procured by companies and government agencies as gifts for employees[12] or are sold at specialty fruit markets in large cities; second-class peaches are sold at wholesale markets. Agritourism is also a channel for this cooperative to sell its products.

Yuexi Organic Kiwifruit FPC: Yufan village in Yuexi county, Anhui province, is situated in a cool mountainous area with 950 hectares or 2,348 acres (approximate 95 ha or 235 acres of farmland, 68 percent of which is paddy field and the rest is dry land, and 850 ha or 2,100 acres of forest land) and a population of 1,005 (257 households). It is the poorest village in the area. The Yuexi Organic Kiwifruit FPC[13] was established in 1999 in Yufan village with the support of a Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) project,[14] the Organic Food Development Center (OFDC),[15] and the local government. The cooperative produced organic kiwifruit and water bamboo. Mr. Chu, a former village officer, has served as the elected cooperative leader because he knows the local situation well and is willing to devote himself to local development. Following the end of GTZ project support in 2003, the organic kiwifruit FPC was divided into two groups in 2006: the kiwifruit FPC and the water bamboo FPC. The latter has

Beyond Corporation (OABC), which is one of the largest companies engaging in the cultivation, production, distribution, and home delivery of organic food in China. Although this company has its own production bases, it also buys organic products from enterprises or cooperatives. FPCs also face great difficulties in selling their products through supermarkets, the major food outlets in most cities, partially due to the small volume of their production and the high standards that must be met. It is also costly to sell products through supermarkets, including paying stocking, sales, and promotional fees, and giving 20 percent of the profit to the store (Lagos, Scott, Rasmussen, Bugang, & Chen, 2010). Therefore many FPCs choose to sell their products at wholesale markets or via direct marketing channels (as we illustrated in the three cases discussed here).

[11] We recognize that there are significant differences in definitions and in the understanding of what constitutes a small- versus large-scale farm in China and the west. In this study, small-scale farming refers to Chinese family farms with an average size of less then 0.5 hectare or 1.2 acres per household, whereas large-scale farming refers to farm sizes over 1.3 hectares or 3.2 acres. During our interviews from 2010 to 2011, farms with sizes over 20 mu (or 1.3 hectares or 3.2 acres) were referred to by several cooperative leaders as large-scale farms. Some of these farms lease land from their relatives or neighbors who choose to work in non-agricultural sectors in cities; others lease undeveloped village land from rural collectives. The latter often have comparatively larger scales (e.g., over 50 mu or 3.3 hectares or 8.2 acres) as we have seen in the Tonglu case.

[12] This cooperative, collaborating with several other cooperatives that produce different crop varieties in the same area, runs its own specialty stores and attracts local consumers.

[13] This cooperative is supported by Yufan Kiwifruit Research Institute, which was founded by several local farmers in response to serious plant diseases and insect pests suffered by kiwifruit farmers in the village from 1991 to 1993. With the technical support from the institute, kiwifruit production grew rapidly in the following 10 years, and this area became "the first township of kiwifruit production in East China" with over 290 ha (717 acres) under kiwifruit cultivation.

[14] The Sino-German GTZ project (1998–2003), named "Development of Organic Agriculture in Poverty Areas in China," was initiated to offer an advisory service and information system in China for organic agricultural development.

[15] The Organic Food Development Center (OFDC), founded in 1994 in Nanjing by the former Chinese State Environmental Protection Agency, is the first specialized organization engaged in research, certification, training, and promotion of organic agriculture in China. It is also one of the largest certification bodies in China.

been growing rapidly. The withdrawal of the GTZ project posed a difficult challenge to the kiwifruit FPC to continue organic farming because of the high certification costs, a shortage of funding, and limited access to value-added markets to garner a sufficient price premium. As a result, the FPC discontinued organic kiwifruit farming. Organic kiwifruits had been exported with the assistance of the GTZ project, while non-organic kiwifruits have been sold domestically through various channels since the project support ended. Water bamboo is delivered to large cities (e.g., Shanghai, Nanjing, Hefei) and sold at wholesale markets. More recently, the retirement of the kiwifruit FPC leader also created difficulties as members lacked confidence in the new leader. Key characteristics of the three FPCs are summarized in Table 2.

Alternative Strategies and the New Rural Development Paradigm

The key function of FPCs is to provide services for their members. These services support on-farm activities (such as providing technical assistance and purchasing inputs together) and/or facilitate marketing their produce (such as sorting, grading, marketing, and processing). Activities and strategies adopted by the three FPCs can be grouped into the three categories of deepening, broadening, and regrounding (Table 3).

Deepening Strategy: All three FPCs have undertaken initiatives to increase the value of their products. Following Renting, Marsden, and Banks (2003), these initiatives can be considered to be new configurations of alternative food networks (AFNs). Three main types of deepening strategies were pursued. First, product branding was developed by all three FPCs with the goal of improving the reputation and market competitiveness of their products. Second, ecological and local characteristics of products (certified organic, green, hazard-free and geographical identification) were simultaneously highlighted in all three FPCs. These formalized standards and labels show the attributes of product quality and can help diversify marketing channels (Renting, et al., 2003). Although organic certification was not continued in the Yuexi FPC after the GTZ project withdrew in 2003, all water

Table 2. Key Characteristics of Three Professional Farmers' Cooperatives in China [a]

	Daizhuang FPC (Jiangsu province)	**Tonglu Peach FPC** (Zhejiang province)	**Yuexi FPC** (Anhui province)
Locations	Close to large cities (Nanjing and Shanghai)	Close to large cities (Hangzhou and Shanghai)	Far from large cities
Initiators	Several local farmers with large-scale farmland	A researcher	The GTZ project and the Organic Food Development Center
Leaders	A large-scale farmer	Local government official	Former local government official
Year established	2006	2004	Founded in 1999 and registered in 2001
Number of members	612 households (70% of village households) in 2012; 3 households in 2006	173 households (60% of total) in 2011; 116 households in 2004	No updated data (138 households in 2002; 43 households in 2001)
Technical innovation	Introduced a new rice variety from Japan	Applied new technology to stagger the harvest time	Promoted suitable crops for local natural resources
Main products	Organic rice and strawberries	Peaches (green and hazard-free certified) and cherries	Kiwifruit and water bamboo (hazard-free certified)
Target markets	Domestic; various channels	Domestic; gift packages & wholesale markets	International (only for organic kiwifruit) and domestic; wholesale

[a] Most data listed in the table were supplied through interviews; additional information came from the report of the Yuexi Organic development Project 2002 (Bao, 2002) and cooperative documents of the Tonglu and Daizhuang FPCs.
[b] Most of the arable land in Yuexi county is cold, waterlogged paddy field, which is not suitable for growing regular crops (i.e., rice) and has low yields, but it is ideal for growing water bamboo. The Yuexi FPC took advantage of the local natural conditions and encouraged farmers to grow water bamboo.

Table 3. Typology of Strategies Pursued by the Three Cooperatives

	Daizhuang FPC	Tonglu Peach FPC	Yuexi FPC
Deepening strategy	Product branding; food processing; organic certification; direct marketing	Product branding; sorting and packaging; green and hazard-free certification; direct marketing	Product branding; organic certification; hazard-free certification; geographical identification (GI) of raw materials (water bamboo)
Broadening strategy	Plan to develop agritourism	Flower Festival and agritourism	None
Regrounding strategy	Unified farming management	Unified farming management; collaborating with other FPCs in the same region to develop agritourism	Unified farming management; collaborating with other FPCs in the same region to transport products to larger cities

bamboo produced in Yuexi county is hazard-free and geographical identification–certified. The Tonglu cooperative received hazard-free certification for 200 ha (949 acres) in 2005 and green certification for 67 ha (166 acres) in 2006. Peaches were sorted into two grades: first-class peaches for gift packages and second-class peaches for wholesale markets. The third type of deepening strategy, employed by the Daizhuang and Tonglu FPCs, was to use used direct-marketing strategies to sell most of their produce. The Yuexi FPC did not, due to the long distance from customers.

Broadening Strategy: At the time we conducted interviews, the Tonglu FPC was the only one among these three cases that developed a broadening strategy, although the leader of the Daizhuang FPC expressed strong interest in promoting agritourism. With the support of the Tonglu municipal government, the Tonglu FPC collaborated with several other FPCs in the same area to host visitors during the period of Flower Festival (lasting for four months from late March to mid-July). During the festival period, they organized many activities, including cultural performances, demonstrations of local agricultural products, tastings, sales, signing sales contracts, picking local fruits, and homestays with rural households. Agritourism (also called agritainment, experiencing life in a rural area) has become a popular form of rural tourism for many urbanites in China (Marsden, Yu, & Flynn, 2011). The leader of the Daizhuang FPC also viewed agritourism as a potential channel to sell its produce by hosting harvest festivals or other activities; it plans to develop agritourism in the near future. Agritourism was not mentioned in the Yuexi FPC, likely due to its distance from urban areas.

Regrounding Strategy: In terms of regrounding strategy, all three FPCs have developed and implemented unified farming management, which can reduce production and transaction costs on member farms by taking advantage of economies of scale. The FPCs made unified plans for farming activities (i.e., what, when, and how it is produced) to enable an adaptive response to increasingly differentiated market demands (such as quality requirements, seasons, product presentation). They also provided various services to their members, such as technical assistance and training; supplying ecological fertilizers and pesticides; supplying seeds and seedlings; and product processing, packaging and marketing. Collaborations among FPCs in the same region were adopted by the Yuexi and Tonglu FPCs to reduce the costs for transportation and for hosting events, respectively, even though these collaborations were informal and very loose. The leader of the Daizhuang FPC planned to combine crop cultivation and breeding (geese in this case) to offset the low productivity of organic rice farming and to increase farmers' income.

Compared to the deepening activities adopted by all three FPCs, the broadening activities are far less developed except agritourism in the Tonglu FPC. The adoption of non-agricultural activities is more challenging for FPCs. The underdevelopment of the broadening activities can be explained

by the following reasons. First, some initial conditions are required to develop these kinds of activities. For example, an initial but significant investment is needed for developing and organizing agritourism in making rural areas attractive, such as providing accommodation facilities, arranging activities, and offering suitable opportunities for spending (Gannon, 1994). Considering the significance of the investment and the uncertainty of economic returns, an FPC is often unable or reluctant to invest in these facilities. Second, government needs to play an important role in funding and facilitating agritourism at the initial stage (Fleischer & Felsenstein, 2000; Iorio & Corsale, 2010). This poses challenges for developing agritourism in poor areas (for instance, Anhui province in our case study) where the local government has a more limited budget. The third reason for the underdevelopment of the broadening activities is that, besides economic constraints, developing non-agricultural activities and in particular agritourism often requires new skills such as guest services, marketing, and advertising (Sharpley, 2002), which are unfamiliar to farmers. In addition, collaboration among FPCs in the same region is important in developing agritourism, as we saw in the Tonglu FPC case (see also van der Ploeg et al., 2012).

Membership and Internal Governance

Based on the contributions in terms of land, labor, financial capital, and other social assets, cooperative members in an FPC can be divided into two main categories: core members (who are full-time farmers, often farming at comparatively large scales) and common or affiliate members (who are part-time farmers[16]).

According to our research, core members are often the village elite, including large-scale farmers, entrepreneurial farmers, business owners, and local government officials. These members generally hold more shares in the cooperative and correspondingly enjoy a greater share of its profits. They play an important role in initiating and promoting cooperative development by serving as the leaders of the cooperative and as members of the governing board. When we inquired about the qualities of an effective cooperative leader, the following characteristics were mentioned most frequently by cooperative members and leaders: having vision, business and management capacity, good education,[17] and an enthusiasm for innovation; and being well-connected, open-minded, and committed to the cooperative. Local officials, who are also farmers in the villages, are often the best suited candidates to be cooperative leaders. Thus, as we saw in the Daizhaung and Yuexi cases, some village officials served as cooperative leaders. However, as we saw in these same two cases, the cooperative leader might not be the same person who initiates the cooperative, particularly in cases where cooperatives are initiated by external forces. The initiators often acted as an external connector in seeking out and providing financial, technical, and/or marketing support to the cooperative, while the leaders focus more on cooperative management and agricultural production.

Common members in all three FPCs appear to be similar in terms of their average size of landholding, age, and part-time farming status. In asking the cooperative leaders about the age, gender, and education characteristics of farm members in their cooperatives, we found that most members are farmers over 50 years old who have limited education. The governing board and core members normally participate more in decision-making regarding all stages of production and marketing, whereas the common members participate mainly in the production domain and are seldom involved in operational decision-making (see Table 4; also see Liang & Hendrikse, 2013). According to the FPC law, everyone in the FPC has equal rights in

[16] Many "part-time" farmers in rural China work in cities during the slack farming season and return to their rural homes only in the busy farming season.

[17] The education level of the rural population in China is relatively low, with an average of 6.5 years of schooling (Zhang, Huang, & Rozelle, 2002). Approximately 14 percent of the rural population in China is illiterate or semi-illiterate (Fan & Zhang, 2004). Considering the fact that migrants to urban areas are better educated than those who have not migrated (Zhao, 1999), the education level of the population who stay behind and continuing farming is lower. In this paper, the term "good education" refers to people with a level of secondary education or higher.

Table 4. Membership and Decision-making in Three Cooperatives

	Daizhuang FPC	Tonglu Peach FPC	Yuexi FPC
Membership	Core members (playing roles in coop. management and technical support) and common members; members farming in almost the same scale	Core members (large-scale; investing more capital) and common members (small-scale)	Core members (leasing large-scale land; investing more capital; delivering products to urban markets) and common members (small-scale)
Decision-making among members	Core members decide on technical innovations and marketing issues, while common members mainly just participate in production		

decision-making (i.e., "one person one vote"), regardless of how much capital he or she has in the cooperative. The low participation of common members in FPC decision-making is largely due to lack of knowledge and information about technical innovations and marketing, being busy with off-farm work, and lack of interest (due to their small scale of farming and rapidly rising wages in non-agricultural sectors).[18]

Government's Roles

The Chinese government has played an important role in promoting farmers' cooperatives by implementing the Cooperative Law and developing a series of favorable policies. This has been particularly significant at the provincial and local government levels, although the extent of support varies by province, based on economic capacity. In recognizing the potential to improve farmers' production and marketing capacities, local governments have used administrative procedures, financial support, and other incentives to encourage the development of farmers' cooperatives within their jurisdictions. This can involve hosting mobilization meetings, providing technical training, arranging site visits for key members, assisting in and providing subsidies for certification for various ecological food standards, providing tax exemptions, and other kinds of financial support.

In this study, we found that the Daizhuang and Tonglu cooperatives receive more government support and are economically stronger than the Yuexi cooperative. This can be partially explained by the fact that Zhejiang and Jiangsu provinces are wealthier.[19] However, we have too few cases in this study to be able to broadly conclude that cooperatives in wealthier provinces or regions tend to be stronger and receive more government support than those in less well-endowed provinces or regions. By asking how much funding the cooperative has received and via which channels, we found that subsidies and financial support are not equally distributed among farmers' cooperatives, even those in the same region. These funding opportunities have each been channeled to cooperatives via various government development projects, such as the Rural Poverty Alleviation program, the Upland and Mountainous Area Development Project, and the High-efficiency Agriculture Project. Our case studies found that cooperative initiators and/or leaders who have contacts in relevant government departments and are socially well connected have played an important role in acquiring funding information and preparing funding applications.[20]

Financial support and subsidies for rural development typically take the form of investment in rural infrastructure, crop storage, and processing facilities. This investment is especially important for cooperatives struggling to raise capital at the start-up stage. According to our interviews, in all three cases a significant amount of government funding had been used for improving village roads. Although this type of government funding was not explicitly linked to support for cooperatives, it has played an important role in better linking coopera-

[18] Interview with the cooperative leaders and members in three FPCs in Anhui, Jiangsu, Zhejiang provinces, various dates, 2010-2011.

[19] Interview with three government officials and two cooperative leaders in Anhui, Jiangsu, Zhejiang provinces, various dates during 2010–2011.

[20] Interview with the leaders of the Yuexi and Daizhuang FPCs, July 26, 2010, and June 1, 2011, respectively.

tives to outside markets. The Daizhuang FPC received interest-free loans of US$35,000 to purchase rice processing equipment. Financing for the drip irrigation systems installed by the Tonglu cooperative was partially supported by the Zhejiang provincial and municipal government. The installation of a drip irrigation system helps minimize water contamination from fertilizer and pesticide runoff, and also reduces labor inputs by avoiding the need for irrigating by hand. To host a local agricultural festival, the Tonglu government had also provided substantial funding each year since 2008 to improve village infrastructure and increase the attractiveness of the village to tourists. Beyond protecting and promoting rural lifestyle and culture, this festival also works as a marketing strategy to help advertise the cooperative and expand the reputation of its products.

Local governments also support cooperatives by providing technical training and product promotion by establishing product brands. For the Daizhuang FPC, the municipal government assisted in establishing collaboration between the cooperative and several agricultural universities in the surrounding areas. The Tonglu FPC had four technicians, all of whom had attended technical training sessions organized and financed by the Bureau of Agriculture in Tonglu county. These training sessions were offered by experts and researchers from Zhejiang University and the Academy of Agricultural Science at the city and provincial levels. After attending training courses three to four times per year for two to three years, the leader and these technicians established an extension program in 2004 to provide on-site technical support to local farmers. The Yuexi FPC was mainly initiated by the GTZ project, and local government agencies played a small role in the early stages. Since the GTZ project ended, local government has started to play a more important role, especially in assisting with hazard-free and GI (geographical indication) certification for all water bamboo produced in Yuexi county. The Yuexi county government established a special department to promote certified agricultural products, mainly hazard-free and green food, to take advantage of the county's abundant natural resources with low contamination.

In addition to these various forms of tangible support, local government has also provided public recognition to selected cooperatives as a reward for their good performance. The Daizhuang FPC was honored by the Ministry of Agriculture with national-level "Model FPC" recognition in 2012. The Tonglu FPC also received many awards and honors from the government, such as city- and provincial-level "Model PFC" recognition.

Discussion

Cooperatives' Contributions to Rural Development

In this study we examined a series of diversified land-based activities adopted by three farmers' professional cooperatives engaging in ecological agricultural production in three provinces of China. These activities have a range of different expressions, including capturing greater value-added in production via certification, branding, processing, sorting, and packaging (found in all three FPCs); shortening supply chains (for example, providing home delivery and operating local specialty stores in the Daizhuang FPC); and expanding to other on-farm activities (for example, agritourism in the Tonglu FPC). Rural systems with strong multifunctionality can offer diverse opportunities for residents in terms of earning non-agricultural income (e.g., agritourism), maintaining high environmental quality, and increasing stakeholder involvement and rural democracy (Wilson, 2010). We categorized the diversified rural development activities into three alternative strategies: deepening, broadening, and regrounding. We assessed the economic, social, and environmental impacts of farmers' cooperatives associated with adopting these activities and strategies. This provided a sense of their contributions to agricultural multifunctionality and rural development.

In all three cases the economic contribution of FPCs to rural development is significant. Members in all three FPCs have reported a significant increase of their household income from agricultural production. For example, the average household income of members of the Daizhuang FPC increased by approximately RMB 5000 (US$310) in 2010. By taking advantage of economies of scale FPCs help overcome the limitations of small-scale

farming in terms of supplying input, marketing outputs, reducing transaction costs, enhancing the safety and quality of agricultural production, increasing market competitiveness, and expanding new markets or value chains. The "deepening" activities enhance the economic empowerment of small-scale farmers by linking them to value-added markets (e.g., ecological and organic products, branding, processing, sorting, and packaging). Beyond producing food, the Tonglu FPC also adopted a broadening strategy (i.e., agritourism) to help advertise the cooperative and increase the reputation of its products. Through united management and collective decision-making, the "regrounding" activities provide economic contributions to farm members by reducing production and transaction costs, and responding more effectively to market demands. These diversified activities contribute significantly to improving household incomes and living conditions of cooperative members, which are also the goals of current agricultural policies.

All three FPCs have experienced substantial growth in cooperative membership since their establishment. As the leader of the Tonglu FPC explained,

> Since our cooperative was founded, many strategies have been adopted, such as branding, certification, sorting and packaging, direct marketing, etc. These strategies have helped increase the prices of our products. Our members now receive higher economic returns from farming. So farmers in our village and those in surrounding villages all want to join in our cooperative. But our cooperative only accepts new members who meet our stringent selection criteria, like willingness to follow the cooperative rules and our production standards, self-discipline, etc.

Given the fact that farmers differ in their financial assets, skills, and social networks, economic benefits of the cooperatives are not distributed equally among members. In addition to selling agricultural products to the FPC, some core members also invest capital in the FPC that gets used for purchasing inputs, processing and sorting machines, and cold storage facilities. They have both user shares and investor shares[21] in the FPC. Therefore, these core members often hold more shares and correspondingly benefit more from the FPC, whereas common members only benefit by selling their products to the FPC (see also Liang & Hendrikse, 2013).

Farmers' cooperatives have also made important social contributions to rural development. The social contributions revealed in our case studies can be categorized into four aspects: social integration, local and regional embeddedness, adoption of food quality standards and food safety, and rural democracy and governance. We will discuss each of these in turn. First, in terms of social integration, on the one hand, the farmers' cooperative model provides a platform for farm members to exchange experiences and gain new knowledge, which further reinforces the ties and enhances social integration among members. On the other hand, through collaborating with other cooperatives, universities, and research institutes, farmers' cooperatives have enhanced their capacity to network with other actors. However, in our case studies we found that the integration among cooperatives was still very loose, partially because the newly enacted Cooperative Law does not define a cooperative federation (i.e., a supracooperative network). This omission could pose significant constraints for cooperatives to grow and gain strength in the global market (Fleischer, 2012).

Second, in terms of local and regional embeddedness, direct-marketing strategies adopted by the Tonglu and Daizhuang FPCs helped reconnect producers and consumers and renegotiate the trust relationship between them, which further contributed to high levels of social embeddedness and relations of regard (Hinrichs, 2000; Milestad, Bartel-Kratochvil, Leitner, & Axmann, 2010). The degree of local and regional embeddedness of the food supply chain is an important indicator of rural development (Knickel, 2001) and a strongly multifunctional agriculture regime (Clark, 2003).

In terms of the third element of social contrib-

[21] According to the FPC law, no single member can hold more than 20 percent of the total investor share in the cooperative.

utions to rural development, each cooperative in our case study adopted certain types of food quality production standards and registered a brand for their products, which would facilitate food safety in China (see also Jin & Zhou, 2011). In addition, as the main actors in FPCs, farmers gained experience in cooperation and democratic governance by electing cooperative leaders and participating in decision-making (although this was limited to the production domain for common members in our case studies).

Environmental contributions of farmers' cooperatives to rural development can also be found in all three FPCs. All three engaged in ecological agriculture (green, hazard-free food and organic agriculture in our cases), which helps to build soil fertility and minimize environmental externalities. Localized food supply chains established by the Daizhuang and Tonglu FPCs reduce the distance that food travels from the site of production to consumption, thereby reducing the need for long-distance food transport and its associated energy emissions (Goodman, 2004). Agritourism can help improve the awareness of environmental problems among both farmers and urban visitors (Brodt, Feenstra, Kozloff, Klonsky, & Tourte, 2006).

Challenges Facing Farmers' Professional Cooperatives

Although FPCs have developed rapidly in China over the past decade, progress has not been uniform across the country due to differences in farmers' education levels and varying economic and social situations among different regions of the country (Garnevska et al., 2011), as well as varying levels of government support, and of trust among farmers. FPCs face many challenges for developing further. In our study, the major challenges faced by cooperatives included limited access to land and capital, a massive loss of young and educated laborers in the agricultural sector, low market competitiveness, weak internal management, and limited government support.

Under the Household Responsibility System (HRS), China's agricultural sector is dominated by small-scale farms, with an average size of less then 0.5 hectares per household (1.2 acres), typically fragmented into four to six noncontiguous plots (Johnson, 2000). As a result of the small scale of land allocated to each household, the economic return of farming is low, which has in turn caused large-scale rural outmigration of young and educated people (Zhang et al., 2002). Part-time farming is very common in rural China, as we found in all three FPCs. For all of these reasons, it is not surprising to see low motivation for farming among cooperative members. In addition, farming has been viewed as "a low status occupation to be avoided" by the young generation (Rigg, 2006, p. 189). Therefore, young and educated people often choose to work in non-agricultural sectors.

Due to the small-scale units of production and low economic returns from farming, lack of financial resources is a common issue faced by farmers and farmers' cooperatives in China. FPCs have difficulty obtaining loans from banks using land as collateral because rural land is collectively owned and farmers have only limited land-use rights under the HRS.[22] In our study, none of the three FPCs mentioned that loans had been provided to their members. The absence of lending services in cooperatives in China might stem from credit not being included on the list of cooperative activities described in the newly enacted Cooperative Law (Deng, Huang, Xu, & Rozelle, 2010). Because cooperatives in China have limited financial resources and do not qualify for loans, the access to external financial support, often from government, is critical for FPCs in order to purchase expensive facilities and equipment. We found in this study that cooperatives with strong government support were better positioned for economic success. Moreover, by using their *guanxi* (informal networks) cooperative initiators can often play an important role in identifying and accessing government funding opportunities. However, relying heavily on the initiator for technical, financial, and marketing support may cause problems for FPCs when external forces withdraw. Members in the Daizhuang FPC expressed their concerns about the future of their cooperative when the initiator could not longer help with securing government funding

[22] Land in the countryside and in suburban areas is under collective ownership unless the law stipulates that the land is state-owned (National People's Congress 1982, Article 10).

and promoting their cooperative and its products.

Low market competitiveness was also a significant challenge for FPCs because of limited access to market information, difficulty in expanding markets, and lack of technical innovation. For most Chinese peasants, farming is the only area in which they have practical experience. Many organic farms in China face difficulties in further expanding markets, especially for value-added products (Pan & Du, 2011; Thiers, 2005). This challenge arose in all three FPCs. The leader of Daizhuang FPC mentioned the difficulties in expanding markets due to its low capacity to invest and the small volume of production to supply major food retailers. This also posed challenges for recruiting more members and expanding its production scale. The Yuexi FPC failed to sell its organic products on the international market with a price premium and had to discontinue organic certification after the GTZ project ended. Although all three FPCs have applied technical innovations to improve their market competitiveness, this could not have been achieved without strong external support. For example, to improve market competitiveness, the Daizhuang FPC introduced a new rice variety from Japan and the Tonglu FPC applied a new practice to stagger the harvest time of peaches to fill supply gaps in the market.

Weak internal management was also a key challenge for FPCs, consisting of low trust among members, lack of effective and dedicated leadership, and passive participation by members. These factors have further raised issues of trust among core and common members and cooperative leaders, an issue that was raised by all three FPCs. The effective operation of farmers' cooperatives requires a high level of cooperation among members to achieve the economy of scale as a single unit (Ortiz-Miranda et al., 2010). Questionnaire surveys in other contexts have found that the level of trust is significantly linked to economic performance (Knack & Keefer, 1997) and citizen participation (Brehm & Rahn, 1997). Lu, Kormelinck, Muradin, Lu, and Ruben (2012) found that members in economically successful FPCs show a higher level of trust with fellow members than those in weakly performing ones. Conversely the low operational efficiency in some FPCs in China has been linked to a lack of trust between and among farm members and the cooperative (Guo, Yang, & Zhang, 2008; Zhang, 2010). The lack of trust has become a social problem and could inhibit the long-term development of Chinese FPCs (Zhang, 2010). In addition, Xu, Shao, Liang, Guo, Lu, and Huang (2013) also pointed out that many FPCs in China have internal governance problems, including overly informal management structures and financial systems. In addition, the part-time farming status limits the level of involvement of common members in cooperative activities. As one core member in the Daizhuang FPC explained,

> It's May and it's the time for rice seedling production now. Farmers only come back to the village for one or two days to do the work. Now you can see that there are no people in the field to take care of these seedlings. They all work in cities through the slack farming season, leaving their farmland unattended.…So, it's unrealistic for us to organize cooperative meetings regularly and let members participate actively.

The results of this study echo the finding of Banaszak (2008) that initiators and leaders are critically important for the successful development of FPCs, especially in the context of China where the majority of farmers farm at a very small scale, have a low level of education and technical skills, and lack social and capital resources. Many cooperatives lack effective and dedicated leadership, as we found in the Yuexi FPC after the previous leader retired. The fact that village officials also serve as cooperative leaders (as in the Daizhuang FPC) might benefit the rural economy and consolidate their position as village officials, but it could also pose challenges for FPCs with respect to democratic management, limited personal energy, and difficulties in separating finance issues between the village as an administrative unit and the FPC as an economic unit. How to enhance internal management is a major issue both for FPCs and the Chinese government.

Conclusions

Several conclusions can be drawn from our comparative case study. First, in adopting the "deepening-broadening-regrounding" typology of van der Ploeg et al. (2002) for our analysis, we found that the deepening and regrounding strategies were more commonly applied by all three FPCs than the broadening strategy. Broadening activities, such as agritourism, are more challenging for China's FPCs because of their high economic risks and the requirements for capital investment and new management and marketing skills. Second, our case studies demonstrate the potential of FPCs to make significant economic, social, and environmental contributions to rural development. However, our interviews suggest that economic gains are not shared equally among members in the cooperative. Common members only benefit by selling their products to the cooperative, whereas core members can benefit by both selling their products to and investing capital in the cooperative.

Third, FPCs in China also face enormous challenges, including limited access to land and capital, a massive loss of young talent, low market competitiveness, weak internal management, and lack of government support in poor areas. Fourth, the Chinese government has played an important role in establishing a supportive environment for cooperative development, mainly through (1) implementing the Cooperative Law and developing a series of favorable policies, (2) intervening directly in the establishment and operation of cooperatives, and (3) providing various forms of financial support (e.g., subsidies, tax exemption, and preferential loans) and nonfinancial support (e.g., technical and marketing assistance and public recognition). The strong government role in promoting FPCs we found in this study confirms previous research that rural development is spurred in large part by the Chinese government, which differs from European countries where rural development has been driven by farmers' initiatives and activities (van der Ploeg et al., 2012). Even though FPCs have played and can play an increasingly important role in rural development, we acknowledge that large enterprises (particularly dragon-head enterprises) will continue to dominate the Chinese agricultural sector and receive strong government support (Huang, 2011; Xu et al., 2013).

This research is just a starting point, and we hope it will inspire further research in this important field. It would be insightful to have follow-up research examine both successful and less successful cases of cooperatives to shed more light on the obstacles that cooperatives have encountered and the major elements behind successful cooperatives in China. Due to differences in economic and social contexts, the development of FPCs varies across regions and provinces in China. The impacts of FPCs on small-scale farms and rural development also vary in practice, so it would be valuable to do comparative studies of cooperatives in different regions and provinces. In addition, in this study we found that cooperative benefits are not equally distributed among members because of the differences in assets and resources. A fruitful direction for future research would be to explore whether there is a connection between these different "classes" of membership and the extent of decision-making in and economic benefits from FPCs. Such research could challenge assumptions about how equitable FPCs are in practice.

Acknowledgments

We would like to thank the editors and anonymous reviewers for valuable feedback on this paper. We also acknowledge funding from the Social Sciences and Humanities Council of Canada for funding the fieldwork on which this paper was based.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

How to communicate with farmers about climate change: Farmers' perceptions and adaptations to increasingly variable weather patterns in Maine (USA)

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Submitted July 29, 2013 / Revised October 27, 2013, and February 3, 2014 /
Accepted February 10, 2014 / Published online July 23, 2014

Citation: Jemison, J. M., Jr., Hall, D., Welcomer, S., & Haskell, J. (2014). How to communicate with farmers about climate change: Farmers' perceptions and adaptations to increasingly variable weather patterns in Maine (USA). *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 57–70. http://dx.doi.org/10.5304/jafscd.2014.044.001

Abstract

While dealing with weather variability has always been a source of stress for farmers, a generally warmer, wetter climate with the potential for increasingly intensive precipitation poses a threat to long-term farm viability. Knowing how farmers think about increasingly variable weather patterns (IVWP) is important for educators, agency staff, and others to learn how to work with producers on adaptation strategies to protect natural resources and prevent crop failure. In 2011, the University of Maine Cooperative Extension conducted focus group sessions with farmers from seven different commodity groups, five mixed farmer sessions, and two sessions with consultants, educators, and agency staff who work with growers to learn about grower perceptions of environmental changes, and to learn about changes they may be making to their farming operations to protect their operations from IVWP. Farmers discussed over 40 practices that could be construed as adaptation measures to buffer against IVWP. Fruit (apple and blueberry) growers spent the most time on the subject and expressed the most concern about the effects of IVWP, while dairy and potato growers spent the least. Given the divergence of opinion on the subject of climate change that Maine growers expressed, successful outreach education through the U.S. Department of Agriculture (USDA) and Cooperative Extension should likely emphasize short-term risk management, resilience, and

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stability of farm operations as opposed to communicating the need to adopt strategies based on climate change.

Keywords
adaptation, climate change, communication, farmers, global warming, production, sustainability

Introduction

The U.S. food system today is characterized by a highly energy-intensive production and distribution system, where most food travels an average of 1,500 miles (2,414 km) before reaching its destination (Halweil, 2002; Pirog, Van Pelt, Enshayan, & Cook, 2001). The greenhouse gas emissions associated with agriculture and other human activities have been predicted to influence the climate by altering rainfall patterns, increasing the frequency of extreme weather, and increasing the length of the growing season in northern agricultural areas (Intergovernmental Panel on Climate Change [IPCC], 2007; Rosenzweig, 2000). With a nearly tenfold imbalance of energy input into food production relative to caloric output (Heller & Keoleian, 2003), it is difficult not to concur with Borgmann (2011) that agriculture is accelerating climate change and that climate change is beginning to cause shifts and disruptions in agriculture. Yet results from a number of recent surveys of growers across the U.S. show that many farmers may believe that the climate is changing, but very few believe it is due to human activities (Morello, 2012). While this suggests that acceptance of climate change is not common among growers, these studies do not address growers' recognition of responses to new weather patterns. In this paper we assess growers' perceptions of changes in weather and their adaptations related to these changes. By examining growers' perceptions of weather as well as associated adaptations, we offer those who work with growers insights regarding strategies for enhancing the reach and impact of interventions. In this paper, the word "adaptation" is used to describe actions taken by farmers to protect soil resources from variable weather or climate change (Smit & Skinner, 2002).

Several studies provide evidence that climate is affecting agricultural production in the Northeast United States. Temperatures have increased in by over 1.8°C over the past 100 years (Jacobson, Fernandez, Mayewski, & Schmitt, 2009) and there has been a more than 70 percent increase in high-precipitation events (defined as >1.0 inches or >2.5 cm in 48 hours) (Wake & Markham, 2005). In some cases, such changes may represent possible opportunities to grow new crops, but extreme weather events such as tropical storm Irene in 2011 also show the risk to agricultural production and potential loss of soil due to erosion. In a recent publication, Hatfield et al. (2014) rated the likelihood as high that climate disruptions to agricultural production have increased in the recent past and are projected to increase further over the next 25 years. Variations in length of growing season, timing of frosts, heat accumulation, precipitation, evaporation, and soil moisture availability can influence production and producer and farming profit (Wall & Smit, 2005).

Possible ways of addressing the risks posed by IVWP are to alter agricultural practices to mitigate greenhouse gas emissions associated with agriculture (Moreau, Moore, & Mullinix, 2012a) (e.g., reducing tillage) and to adapt by lessening the underlying factors causing vulnerability to these phenomena (Schipper & Pelling, 2006). While all agricultural production methods are vulnerable to climate variation to some degree, some commodities and production methods, particularly those with intensive tillage, are more susceptible to soil loss and yield variability. Agricultural adaptation strategies have been explored that potentially can reduce the impact of damaging weather on crop yield, soil loss, and water quality deterioration, such as (1) growing varieties with greater range of tolerance to heat stress and drought; (2) wider use of practices to conserve soil moisture, including reduced tillage; (3) altering timing and location of cropping activities; (4) diversifying farm income as much as possible; and (5) improving effectiveness of pest management by using more resistant varieties and improved weed management measures (Fraisse, Breuer, Zierden, & Ingram, 2009; Howden, Sousanna, Tubiello, Chhetri, & Dunlop, 2007). Other specific measures such as double-cropping small grains and corn have been shown to provide improved soil protection and

increased forage production for dairy farmers by providing soil cover for a greater part of the year and more efficiently capturing and utilizing solar energy, compared to growing a full-season corn crop (Jemison, Darby, & Reberg-Horton, 2012). If growers view these measures as beneficial and cost-effective means to manage risk rather than treat them as adaptations to climate change, perhaps they will be more widely considered and could improve agricultural resilience.

While climate scientists are generally in agreement about the nature, causes, and consequences of climate change (Rosenberg, Vedlitz, Cowman, & Zahran, 2010), a Rasmussen interview conducted in 2011 indicated that only a slight majority of Americans believe that climate change is a serious problem, and a vocal minority remains particularly hostile to climate scientists (Why don't Americans believe in global warming?, 2011). The issue is often polarized along partisan lines. So one should consider that many farmers may not think climate change is occurring, or might be offended by the concept or terminology associated with human-induced climate change. While excellent methods have been proposed to educate farmers about what they can do to reduce greenhouse gas emissions associated with their production (Moreau et al., 2012b), farmers may not be receptive to learning about or adopting conservation practices if these are perceived to be related to climate change "fixes." Learning about minimizing risks related to volatile weather may be an avenue that engenders less grower resistance and more of their attention.

Learning what growers think about current weather patterns and their understanding of adaptation to mitigate effects of climate change is an important first step in preparing farmers to adopt strategies to protect soil and water resources from uncertain weather events. Some actions that growers could adopt, like cover cropping, reducing tillage, reducing on-farm energy use, and developing efficient local markets, are all sound and sustainable practices that farmers should adopt regardless of how they view the idea of climate change (Grubinger, 2009). Knowing how to conceptually approach growers and enhance their capacity to implement strategies to protect soil and water resources should be the basis of a core adaptation strategy (Meinke & Stone, 2005).

This paper draws on a qualitative analysis of a cross-section of Maine's farmers who met in 2011 to discuss current and future farming issues. While the conversations covered a range of agricultural issues, this paper particularly focuses on Maine farmers' perceptions about weather variability and whether they were planning to or had implemented practices on their farms to reduce their risk of soil loss, crop failure, or related issues.

Methods

The purpose of the study was to assess farmers' and agricultural service providers' (ASP) thoughts about the future of Maine's agricultural industry. Because anticipating the future of a shared industry is a community matter, we chose to conduct focus groups to gather information from farmers and to promote discussion among the farmers (Brewer & Gross, 2005). The program was called "Assessing Maine's Agricultural Future – 2025," and we actively recruited younger growers in an effort to focus on the future of farming in Maine. The sessions, however, were open to anyone interested in participating so as not to exclude relevant voices. We conducted group interviews with farmers from seven major agricultural commodities in the state, including potato, dairy, blueberry, vegetable, apple, beef, and the growers of nursery plants for the landscape industry (Table 1).

In addition, four sessions were conducted with farmers from across production groups (referred to in the quotations as MFG-1 through MFG-4), two sessions were held with crop advisors and university and agency staff who work closely with farmers, and one session was held with the staff of the Micmac Indian Nation who have a farm in northern Maine. Potential participants were identified with assistance from industry leaders, Extension educators working with specific commodities, or by recommendations from other growers. Participants are presented by age groups in Table 2.

To encourage participation, interviews were conducted during the off-season across the state. When possible we coordinated sessions with previously scheduled grower events. Each session

Table 1. Future of Agriculture in Maine — 2025 Focus Groups

#	Location	Group	Date	Participant totals (female)
1.	Orono, Maine	Mixed farmer group (MFG) #1	10 Dec 2010	11 (7)
2.	Augusta, Maine	Mixed farmer group (MFG) #2	12 Jan 2011	12 (5)
3.	Portsmouth, New Hampshire	Agricultural Service Providers (ASP) – #1*	26 Jan 2011	24 (6)
4.	Portsmouth, New Hampshire	Agricultural Service Providers (ASP) – #2*	26 Jan 2011	23 (2)
5.	Belfast, Maine	Mixed farmer group (MFG) #3	28 Jan 2011	26 (16)
6.	Presque Isle, Maine	Micmac Indian Nation	2 Feb 2011	4 (1)
7.	Presque Isle, Maine	Potato growers	2 Feb 2011	11 (1)
8.	Ellsworth, Maine	Blueberry growers	9 Feb 2011	10 (3)
9.	Augusta, Maine	Vegetable growers	25 Feb 2011	6 (0)
10.	Unity, Maine	Dairy producers	2 March 2011	15 (4)
11.	Unity, Maine	Organic growers—mixed farmer group (MFG) #4	16 March 2011	14 (5)
12.	Presque Isle, Maine	Vegetable growers	30 March 2011	5 (2)
13.	Presque Isle, Maine	Beef producers	30 March 2011	17 (2)
14.	Monmouth, Maine	Apple producers	14 April 2011	11 (1)
15.	Manchester, Maine	Horticultural growers (Maine Landscape and Nursery Association [MELNA])	13 July 2011	10 (1)
	Totals			**199 (56)**

*Agricultural Service Provider Sessions (ASP) were divided into two groups: Session 1 included primarily Extension Educators and Natural Resource Conservation Service staff; session 2 included primarily private crop consultants who work directly with farmers.
Based on field notes headcounts.
178 filled out demographic information forms.

lasted between 90 and 120 minutes. We asked participants 10 questions (Table 3).

Audio from the sessions was digitally recorded, transcribed, and analyzed using QSR NVivo 9 qualitative analytic software. Thematic categories were established based on interview questions, and participant comments were coded as positive, negative, or "action taken." For example, if a grower said that winters were definitely warmer and this allowed planting a new crop, this would have been coded as a positive perception of climate change, and the change in crop would have been tracked as an action taken. With the software, group similarity associations were made based on Pearson correlations of language and topics raised by participants in the commodity and mixed farmer sessions. We present the results of these focus groups regarding changes farmers are making related to variable weather patterns along with a spectrum of the verbatim responses made by farmers concerning their perceptions of the predictability of weather and climate change. The quotations are included to capture the language growers use to discuss these issues and reflect the diversity within and between farming groups. Because this analysis was made at the group level, we did not analyze language at the level of individuals, and therefore we did not track comments made by specific growers within a group.

Table 2. Program Attendees by Age Group Who Participated in the "Assessing Maine's Agricultural Future — 2025" Program, 2011

Participants	Numbers*	Age Distribution (years)			
		<30	30–39	40–49	>50
Farmers	135	37	26	25	47
Crop Advisors	43	2	8	12	21
Total	178	39	34	37	68

* An additional 21 individuals participated as determined by counting participants in the room, but they did not fill out demographic information forms.

Table 3. Questions Asked of All Focus Group Participants

1.	Why did you choose agriculture for your profession?
2.	What were some of the first words or thoughts that came to mind when you heard about this focus group for "Assessing Maine's Agricultural Future – 2025" and beyond? Or what led you to choose to participate in this session?
3.	What is going well for Maine agriculture and what are you optimistic about for the future?
4.	What concerns you about the future?
5.	What changes are you making on your farm relative to recent weather patterns?
6.	What changes are you making on your farm relative to volatile energy pricing?
7.	What can the state do to grow agriculture?
8.	How are you getting information today related to your industry?
9.	What will Maine agriculture look like in 2025?
10.	What questions should we have asked that we didn't?

Results

A total of 199 people participated in this project. Demographic forms were completed by 178 participants (Table 1). Of the 178 forms collected, 58 participants were female. When growers were asked what they were optimistic about, the most common responses were the public's growing interest in local foods, the availability of affordable land and water to farm, and the large potential markets within a day's drive of Maine. When asked what they were concerned or pessimistic about, growers focused primarily on issues of regulations and rising energy costs. Issues like the growing size of farms and the loss of support and infrastructure were also mentioned. Before being asked specifically about changing weather patterns, only one grower commented that he was concerned about the lack of predictable weather.

That no other grower expressed concern about apparently IVWP, without being prompted, was somewhat surprising. Variability is a characteristic of weather, but since farmer livelihood is dependent on weather and given the increased precipitation frequency and intensity reported in New England (Hayhoe et al., 2007), we expected that more farmers would mention it as a source of concern. Further, the majority of these interviews were conducted from December 2010 through April 2011, following two widely variable growing seasons: The summer of 2009 was one of the wettest summers on record (Stampone, 2010). This was followed by an extremely warm winter and early spring in 2010. Many fruit growers lost much of their crop due to late frosts that killed flowers that opened earlier than normal due to an early bud break. Yet only one grower, before being prompted by a question specific to weather, mentioned changing climate as a source of concern.

While growers did not initially or spontaneously express concern about current weather patterns, there was considerably more discussion when farmers were asked what changes they were making on their farm with respect to fluctuating or variable weather patterns. We specifically chose not to use the term "climate change" because of the politicized nature of the term (Pielke, 2010), and we also wanted to hear what terms Maine farmers used to describe their experience with local weather patterns. However, several growers considered the question as a prompt to talk about climate change and expressed their opinions on the topic; below are a few statements that reflect dissent or disagreement that climate change is occurring:

- "It always seemed like it's been like this. I can't remember really fantastic springs. Every year is different. I really don't think that we've seen a change." (beef producer)
- "[The] climate is changing all the time." (dairy farmer)
- "I don't think that the weather patterns of Maine have changed significantly…"

(blueberry grower)

- "What is 200 years in the realm of the earth? We don't have a clue what's going on." (beef producer)
- "Just in the last two years we've gone through one of the wettest years in history to one of the driest. So how can you call that a pattern? I've certainly been through wet and dry and that's just what it is." (dairy producer)
- "If they say that the climate is changing due to, what's the big word? Global warming. If this is global warming, I love every minute of it." (beef producer)

In contrast, other farmers, particularly apple and blueberry growers, expressed real concern that environmental conditions were changing. For example, one apple grower who had saved his records of pesticide applications for over 20 years found he was spraying significantly earlier in the season. Examples of these statements include:

- "There's no denying it. There is now a five to ten day earlier need to get out in the field. I mean, that's telling you something about the climate." (apple grower)
- "I do believe global warming is going to have a very severe impact on the blueberry industry even with irrigation because the heat in August has become so intense that it can literally cook the berries within hours in the field. So, I do think that that environmental aspect of global warming is something we're going to be dealing with in 20 or 30 years." (blueberry grower)
- "Yeah, the winters aren't quite as cold but the erratic weather's a problem. I agree… a problem for agriculture is the up and down swing." (apple grower)
- "The climate of Maine provides a competitive advantage for producing crops that other climates cannot produce. Changing climate threatens the stability of this certainty." (blueberry grower)
- "The problem with weather and growing food is that the climate in which we grow food, well there's a very narrow window of stability. I mean, we get outside that window very far and everything falls apart. So yeah, I mean it's a real serious concern." (blueberry grower)
- "There's still a lot of resistance to climate change, and there's still a lot of people think it's a hoax. But, I'm concerned about McIntosh [apples] requiring a very specific weather. And if that changes, our major crop is going to be dramatically affected. That apple has to compete on the shelf and so far we've been able to produce a good product and compete with the Fujis and the Braeburns and those other varieties that we can't grow. If we can't grow a quality McIntosh people aren't going to buy it...Providing the weather stays the same, it's a variety that we can do here that nobody else can do well." (apple grower)
- "Back to back, with these weather changes you saw probably our toughest year two years ago, the best growing year last year and when you start getting a hundred year storms every four years, you begin to wonder, you know, that perhaps there is something to this sort of thing." (apple grower)

Other related grower and consultant comments are presented below:

- "I think we've experienced a warming trend, which isn't necessarily bothersome to most of us because we're in a pretty cold climate to start with. But, I don't know where that's going to end." (beef producer)
- "They're [farmers] not thinking that…the climate is getting warmer and warmer, it's that it's getting more unpredictable, with greater extremes, and shorter intervals between those extremes. You know, they need to understand that it's not necessarily an opportunity, but they need to have some flexibility in there or be aware of what those changes are to keep those in mind for their long term plans." (ASP #2)

Some growers expressed optimistic views about Maine climatic conditions:

- "We have relatively stable climate compared to a lot of areas and I think that's the big thing." (vegetable grower)
- "But the realistic thing is that Maine does have four real seasons and we do have some protection because we're close to the coast. If there is global warming, then I don't think it's going to affect us as much as say, Arizona or California." (blueberry grower)

These suggest that growers' attitudes about climate change are mixed, ranging from dissent to acceptance, and beyond acceptance to welcoming it. This mixed level of acknowledgment and concern, however, is not the same for outcomes associated with changing weather, such as new pests and increasingly extreme and erratic weather.

New pests are an issue that agricultural publications and Cooperative Extension staff cover in educational programming. Apparent concern about this issue appeared to be greater for vegetable growers and consultants than for growers of other commodities:

- "It seems as if, what has been considered the norm for the recent past is changing and new insects and new diseases have showed up in my brief period of time being here and, granted, that's always been happening, but I guess it was disconcerting for everyone that it ever happened to. It makes you wonder what the future is going to bring in terms of new weather patterns, new diseases, and new insects. And it's just interesting when you can actually see it happen. When I first moved to Maine in 1996 there were no Japanese beetles in [town name]. Now there are Japanese beetles." (vegetable grower)
- "We're seeing more insects problems than I've seen in the last three or four years. We've seen striped cucumber beetles, squash bugs, more Colorado potato beetles. I'm just seeing more bugs than I've seen [before] and cause of the cli — it is warmer. Ha, I mean sorry, it is warmer." (vegetable grower)
- "The other negative thing that I've noticed is a lot of the real scary pests that live down south have started to rise [agreement from crowd] because our winters are so bad that they usually kill them. But, not so much [in recent years]." (grower: MFG #2)
- "In Vermont, a lot of the farmers that I am working with have recognized that the climate is changing and that it's different. Anybody with a close relationship to the land knows that we're seeing a lot of differences from diseases to pests that we've never seen before. We've never had ticks in northern Vermont. We've never had certain diseases, and people that are really in tune with the land realize there is something going on, but I would agree people aren't saying oh, it's global warming. They just know that the weather has changed.… Things are changing, and I don't think that our farmers are looking at as, oh, it's just that year. They know that things are changing. So, we're trying to adapt to that." (ASP #2)

Not surprisingly for people who rely on weather to make a living, several famers spoke about always having to fight the vagaries of weather. We were specifically interested in hearing how farmers discussed variable weather:

- "It's really not a gradual transition that you used to be able to read and figure out. And it's chaotic....It's really a tricky thing and I think people should be talking about it." (organic farmer, MFG #4)
- "You have to believe that build-up of carbon dioxide has some sort of effect on that [weather], and we, as farmers, can have some influence on that. You know, we can sequester carbon back into the soil and help with that. We can help ourselves at the same time." (beef producer)
- "The perception that weather is warming and becoming more moderate is a public

misunderstanding, it is becoming more erratic." (grower, MFG #3)

- "There is some documentation that says since the 1940s, lilacs are blooming two weeks earlier. There is absolutely no question that it affects plants greatly in the way that they behave. If last year told us anything it's that getting an early start on growth is not necessarily a good thing because when we had seventeen degrees in the middle of May, it toasted every single hydrangea, magnolia, anything with longer than two inches of new growth was dead the next morning. Then it happened the next night, as well. Plants cannot adapt to that. If it is too warm for too long like it was a year ago, there is no question that it cost us all thousands of dollars.…If overall we said all right, the weather is moderating, we're going to be able to grow more things. People laugh that we'll be growing oranges and bananas. Well, no, we won't…" (landscape and nursery association grower)
- "You're all talking about some pretty consistent weather changes, I think, and there's probably a lot to that. I've had a bigger problem with it being just unpredictable. And, the only thing I can really think to do about this is to diversify and hopefully if one thing doesn't do too well another thing does." (grower, MFG #2)

Descriptions of the impacts caused by weather extremes:

- "Irrigation helps, but you can still lose; we've lost an entire crop in two days due to heat stress. Forty acres, gone.…I mean, it can happen within hours." (blueberry grower)
- "Any time that you have to deal with extreme, either extreme wet or extreme drought, there is a whole different level of environmental issues that come into play. When they have a drought year in Aroostook County, everybody's drawing water for irrigation out of Caribou Lake. And, they pretty much drain it." (ASP #2)

Although growers were mixed in their assessment of the existence and in their concerns about climate change, they articulated common concerns about factors associated with weather changes such as more erratic weather, new pests and more extreme weather events. Although the cause of these factors was in dispute, the issues themselves were largely common across grower groups. Prominent in growers' responses were the importance of managing for weather, as well as attendant strategies to address specific perceived threats such as new pests and uncertain and extreme weather.

Issues in Managing for Variable Weather

Unable to control the inevitable vagaries of nature, growers spoke about possible efforts to improve farm management so as to hedge against vagaries of climate. Example quotations are provided below:

- "What do we do? I order an extra pallet of plastic so I can put up more silage if it's a real rainy year. If it's a dry year, we make dry hay. It's all we can do. You ain't gonna change the weather." (beef producer)
- "There's never been two seasons alike — it's how you manage that [season's] weather that is important." (dairy producer)
- "We make changes all the time to adapt to whatever the situation is. I mean, to try to anticipate that this next year is going to be like last year it [is] just, just a waste [of] time….In the end I gotta have a crop to feed my cows and I'm not trying to anticipate that next year I'm going to be able to be in the field on the 15th. I'm going to be ready to be in the field on the 15th but if it doesn't work that way we'll get there somehow." (dairy producer)
- "I think the biggest thing the weather patterns have done for me is learning how to stay on top of my management." (vegetable grower)
- "Some growers are trying to increase their land base, so they can go to longer rotations to counteract some of the dry weather we've been experiencing." (ASP #2)
- "Be nimble is all I can say." (apple grower)

- "Yes, that's a good way of putting it, you've got to be ready." (apple grower)
- "Mother nature's a bitch.…Deal with it." (apple grower)
- "I've seen some stuff from over in Europe where they were playing with hail cannons and they sent something about the size of a silo that they blew up to try to split a thunderstorm in half." (apple grower)
- "I think resilience is a great concept to keep in mind if you're involved in agriculture and just that idea of being able to withstand challenges whether they're economic or weather." (blueberry grower)

These quotations illustrate growers' apparent understanding of the need to be knowledgeable and responsive to issues associated with IVWP in modern farming. Strategies to respond include specific measures such as water management, season extension, and systemic approaches using ecological methods and farm diversification.

Diversifying Operations

- "The only thing I can really think to do about this is to diversify and hopefully if one thing doesn't do too well another thing does." (vegetable grower)
- "But I think for most people, the best hedge against that unpredictability is diversity." (organic grower: MFG #4)

Adding Irrigation and/or Tile Drainage

- "In Aroostook County irrigation is becoming a big thing now. There are irrigation units going in every year now and ponds are being made. Our weather hasn't been very predictable; we've had dry summers, two or three in a row. It's affected the yield, so we're getting a lot more irrigation up there." (ASP #1)
- "We have added irrigation also and that's something that was never, we never thought we'd need, but we have added irrigation." (grower, MFG #1)
- "There is more tile draining, there's kind of a Renaissance going on. I thought it kind of slowed up in the '60s and '80s, now guys are realizing that six inches of raining can be handled." (vegetable grower)

Extending the Season

- "We hope to extend the season. It's a short season up here. Extend it with the green houses, and also high tunnels." (Micmac)

Adopting More Ecological Production Methods

- "It seems to me is what's happening is the trend isn't a trend anymore; it's just totally unpredictable. Or we're trending more towards unpredictability. And I think that's consistent with the scientific models that are predicting climate change. And I think that most people here understand that intuitively and use diversity as a tool, not necessarily to hedge against that climate change but it happens to have multiple benefits. I mean, this is an ecological principle, right. There's so many benefits of diversity, and this is just one of them… All the long-term ecological studies that are comparing sort of conventional soil management with organic for lack of a better word, ecological, really show that ecological soil management is really much less vulnerable to climate variability and unpredictability for various reason. So I think that's really the best hedge that all of us can have. And aside from that just investing in other ways to control the things that you need." (organic grower, MFG #4)
- "We need to help farmers build more resilient systems because there are these extremes, and they're very difficult to deal with if a farmer is not prepared. And, I am talking about like whole system changes to crop rotations and just different things like that. Once farmers start doing it, I found that they realize, 'Oh, my soil drained better this year because I am not growing continuous corn anymore and going through a quicker rotation. So, then when I got ten inches of rain, my soil didn't become a compacted pancake.' Our job is to help guide them [to] build a more resilient system, and in some cases, it's not what they're used to, so we have to really be up on our game thinking of different things to do." (ASP #2)

The quotations above provide a sense of the language growers used describing variable weather and measures taken to adapt to it. Growers' comments were also quantified to assess how easy it might be to get growers to adapt practices to protect their farm assets from IVWP. Twenty grower comments were coded as suggesting specifically negative impacts (generally not positive to growth or economic viability) of a changing climate, compared to only seven comments suggesting positive impacts (Table 4).

The negative comments mostly reflected a fear of new pests (diseases and invasive species) and general lack of control of weather (such as the growing costs associated with adaptation strategies of hoop houses and transitioning to irrigation equipment used on vegetable farms today). Positive comments included the potential opportunities created by longer or extended seasons and the possibility of growing new crops.

Discussion

Variable weather patterns have always and will continue to play an important role in the production risks faced by farmers (Adams, Hurd, Lenhart, & Leary, 1998; Fraisse, Breuer, Zierden and Ingram, 2009). How farmers view IVWP or climate change and whether they may be implementing measures to adapt to this have not been fully explored, particularly among U.S. farmers. Recent studies have evaluated farmer vulnerability and willingness to adopt specific farming practices to adapt to climate change in the Sahel and in Burkina Faso, areas prone to wide fluctuations in weather (Barbier, Yacouba, Karambiri, Zoromé, & Somé, 2009; Mertz, Mbow, Reenberg, & Diouf, 2009; Ogalleh, Vogel, & Houser, 2013). Growers have adopted strategies like crop diversification, variety selection, and micro water harvesting, but in both places, researchers could not specifically report that the adaptations were implemented because of concern over climatic impact on production. More often profit or greater food security was the reason given for the management change. Growers in the U.S. have been privileged to have many more tools available to protect them from variable weather, including crop insurance, irrigation and drainage, and now a wider variety and selection of hybrid options, including transgenic drought-tolerant lines.

Growers' responses indicate that, as supported by previous studies, there is a mixture of opinions about linking weather changes explicitly to climate change. There is, however, awareness and recognition of changes to weather and in outcomes related to these changing weather patterns. Growers say that seasons are shifting, new pests are appearing, variability is the "new normal," and managing water in both drought and flood conditions is a priority.

Most of the growers interviewed in this study seemed to stress that weather was becoming increasingly variable, but whether most viewed this as an indicator of a changing climate was not clear. A majority viewed IVWP as negative to farm productivity (Table 4). This is in contrast to a study

Table 4. Negative and Positive Comments Related to Fluctuating Weather Patterns or a Warming Climate

Negative Comments	
Grower Group	**Observation** (# of mentions)
Apple Vegetable Potato	More pest pressure (6)
Apple Blueberry	More crop damage (5)
Apple Blueberry MELNA Beef Dairy	Too erratic (4); lack of rain (3); lack of snow protection (2)
Positive Comments	
Grower Group	**Observation** (# of mentions)
Vegetable	Earlier sweet corn to market
Apple	New crop potential, specifically peaches and cherries
Potato Dairy Vegetable	Longer growing season (4)
Beef producers	Earlier grazing potential

done with growers in the UK, where Holloway and Ilbery (1996) found that growers viewed global warming from a slightly more positive than negative perspective, specifically due to the possibility of growing different crops and gaining higher yields of maize and small grain cereals. They also found that the participating UK farmers were more concerned about specific environmental issues or regulations that were imposed upon them rather than climatic change. In some cases, we found similar results; some potato farmers expressed hope that a longer growing season would boost yields. While we didn't ask growers to rate concern over regulations compared to concern over variable weather, we found that when we asked farmers to discuss policy changes they felt were needed at the state level, they had more specific comments about reducing regulations than they did for specific policy measures that might help farmers facing IVWP and a less predictable crop production environment.

Adams et al. (1998) reported that rates and levels of adaptation depend on the risk preferences of farmers. Subsistence farmers are more likely to diversify their planting based on their need to survive. In contrast, technologically driven farming systems may be more susceptible to loss as they generally consist of larger acreage of one or two major crops. Interestingly, the dairy and potato commodity farmers (generally larger acreage farms relative to farms typical of the producers in the mixed farmer sessions) spent less time on the topic of IVWP than most of the smaller acreage growers, and these growers' comments were grouped similarly in the NVivo analysis. Potato production involves many tools or practices that inherently help those growers protect themselves from variable weather (seed treatments, fungicide use, irrigation, etc.). Potato growers are dependent on intensive tillage, and soil loss is a particular threat with IVWP particularly when soil is exposed (after planting and after harvest). Many dairy farmers can reduce tillage and can usually grow more corn affordably and harvest more hay acreage than they need to protect them from environmental variability. Further, dairy farmer concerns are divided between crop production and animal health and milk production, and as such, they may focus somewhat less on issues of IVWP than fruit or vegetable producers. NVivo also grouped the blueberry and apple growers and the beef producers together in one group, in part based on the number of comments and word associations made in discussing IVWP.

Table 5. Specific Management Measures Implemented Due to Fluctuating Weather Patterns or a Warming Climate

Specific Management Measures (# of mentions)	Grower Group
Increased reliance on hoop houses for environmental control (5) Drainage tiles (4) Fewer cold-hearty varieties More hoop houses (5) Use of permanent mulch systems Irrigation (4) Raised beds (4) Increasing diversity beyond vegetables Planting earlier sweet corn Extending our season Permanent mulch	Vegetable
Use of hail nets (2) Irrigation (3) Planting more peaches and cherries	Apple
Growing longer varieties	Potato
Earlier grazing Plastic-wrapped silage	Beef producers
Irrigation	Blueberry
Irrigation Drainage More hearty and/or locally adapted varieties	Landscape

Participating growers mentioned at least 41 different practices that could be considered examples of adaptation that they had implemented on their farms (Table 5).

This is not an exhaustive list of all the practices these farmers might have implemented because it is possible that if one participant were to mention a method or practice, another participant may choose not to raise the same point. Also, decisions to implement

these practices to reduce risk have to be considered in the context of a wide range of other reasons: increased yield, earliness of harvest, disease prevention, etc. However, considering that we heard growers mention at least 41 adaptation practices implemented on their farms, we considered this to be positive.

While these data show the rich variability in grower responses to issues of IVWP, they also raise the question of how agricultural service providers (consultants, educators, and agency staff) should approach growers to encourage them to implement more adaptive measures. Howden et al. (2007) suggest several possible solutions: reward early adopters; focus educational programs on climate risk management; research effectiveness of adaptation strategies; and better understanding adoption rates and how to improve them. Quantifying potential benefits of adoption strategies and having early-adopter farmers discuss changes seen on their farms in educational programs should help increase the pace of adoption.

Outreach programs through USDA and Cooperative Extension should emphasize resilience and stability of farm operations as opposed to communicating the need to adopt strategies based on climate change. As Howden et al. (2007) state, "'adaptation' is an ongoing process that is part of good risk management" (p. 19692), and the more that extension and agricultural consultants move farmers in this direction, the better positioned the grower should be. Further, programs should motivate growers to adapt solutions that emphasize increasing resilience rather than attempting to motivate based on articulation of climate change. Based on how Maine farmers discussed the issues, we believe most other farmers will be receptive to programs that fit a culture of problem solving and reducing risk. Salient problems identified by Maine growers were erratic and/or extreme weather and new pests. These issues potentially could be productive entry points for agriculture consultants to use when discussing key adaptive strategies to handle threats. Consultants could also pursue or capitalize on perceived opportunities vis-à-vis discussing new crops and season-extension measures.

Conclusions

If predictions from groups like the Northeast Climate Impact Assessment are correct, winter and summer temperatures will rise, more winter precipitation will fall in the form of rain, and the intensity of storms will increase regardless of changes made in energy emissions (Frumhoff, McCarthy, Melillo, Moser, & Wuebbles, 2007; Wolfe, 2005). A warmer atmosphere will likely hold more moisture, and precipitation frequency, amounts, and intensity will increase (Frumhoff et al., 2007). Given this, there is an increasing sense of urgency to engage farmers in discussions about adaptation strategies to protect long-term farm income, build soil health, and protect natural resources (Moreau et al., 2012a). Focus group discussions are an excellent means to respectfully learn how growers perceive changes and to assess growers' inclination to implement changes on their farm to protect long-term farm viability and do their part to protect natural resources.

Acknowledgments

We acknowledge the time and help our participating growers gave to this work. This material is based upon work supported by a Trustee Professorship from the University of Maine and the National Science Foundation under award # EPS-0904155.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Understanding collaboration among farmers and farmers' market managers in southeast Michigan (USA)

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Submitted October 17, 2013 / Revised December 28, 2013, and February 8, 2014 /
Accepted February 27, 2014 / Published online July 28, 2014

Citation: Miller, C. L., & McCole, D. (2014). Understanding collaboration among farmers and farmers' market managers in southeast Michigan (USA). *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 71–95. http://dx.doi.org/10.5304/jafscd.2014.044.003

Abstract

The growth in local food systems has resulted in many benefits for communities. In addition to meeting growing consumer demand, local food systems make significant positive contributions to economies, communities, and the natural environment. However, most local food systems are grassroots efforts and rely on stakeholders motivated to collaborate with each other in order to be successful. Most of the parties involved in these collaborations have very limited resources and therefore must choose carefully the collaborative initiatives in which they will invest their time and money. Too frequently collaborative initiatives are doomed to failure because the required players lack the motivation to participate at levels needed for success. Such failures can damage the overall culture of collaboration within a region.

This study aims to address the lack of research into local food system collaboration by exploring the suitability of expectancy theory to understand the factors that motivate farmers and farmers' market managers to collaborate in southeast Michigan. A survey instrument was distributed to groups of farmers and farmers' market managers to measure their beliefs about collaboration's ability to generate positive outcomes as well as each group's perceived value of those outcomes. Comparisons were made between the two groups to better understand the types of collaborative initiatives that would serve the needs of both groups, as well as the initiatives that generate differing levels of motivation within each group. Results show that farmers and farmers' market managers are motivated to collaborate differently. Implications are provided for local food system players, policy-makers, and researchers.

Keywords

collaboration, local food system, farmers' markets, expectancy theory

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Introduction

Consumers are increasingly demanding foods that are produced, marketed, and distributed locally, leading to the growth of local food systems (King et al., 2010). Although these food systems compose a small portion of overall agricultural sales, direct-to-consumer marketing is growing rapidly and accounted for $1.2 billion in 2007, a 118% increase over a ten10-year period (Martinez et al., 2010). In addition to meeting consumer demand, emerging evidence suggests that local food systems are an important source of community prosperity. Local food networks may benefit communities economically in a number of ways. When farmers sell their products directly to consumers, a greater percentage of the revenues from the sale remain in the local economy (O'Hara, 2011). Moreover, as local food initiatives such as farmers' markets grow and become more stable, jobs are created in the local community (Henneberry, Whitacre, & Agustini, 2009; Hughes, Brown, Miller, & McConnell, 2008; Myles & Hood, 2010; Otto & Varner, 2005).

In addition to driving economic activity, there is also some evidence that local food systems may benefit communities in other ways, including improved health and nutrition among community members (Herman, Harrison, Afifi, & Jenks, 2008; Racine, Vaughn & Laditka, 2010; Schumacher, Winch & Park, 2009). Farmers' markets, a cornerstone of local food systems, may also contribute to a stronger sense of community as they may offer more opportunities for social interaction than shopping in a grocery store (Lester, 2012; Oberholtzer & Grow, 2003). Furthermore, the growth of local food systems may also benefit the environment. Because local foods are typically sold unprocessed directly from the producer to the consumer within the same region, less energy is consumed from activities such as transportation, food processing, storage, and preparation (O'Hara, 2011).

Although local food systems may offer benefits to communities, their success depends on a number of factors, including government regulations, expertise and technical assistance, infrastructure, and agricultural policy (Martinez et al., 2010; O'Hara, 2011). In addition to these, and in most cases at the core of these, collaborative capacity is critical to the successful development and survival of local food systems. Matopoulos, Vlachopoulou, Manthou, and Manos (2007) describe collaboration as "organizations and enterprises working together and can be viewed as a concept going beyond normal commercial relationships" (p. 178). This concept is a vital component of local food systems.

Many researchers have discussed the importance of collaboration in food systems (e.g., Alonso & Liu, 2012; Che, Veeck & Veeck, 2005; Hall & Sharples, 2008; Mitchell & van der Linden, 2010), but the significance of collaboration is demonstrated even by the vocabulary used to describe concepts important in food systems. Almost any article or report about food systems uses terms related to the concept of collaboration such as "partnership" (e.g., strategic partnerships; value chain partners), "alliance" (e.g., strategic alliances), "aggregation" (e.g., aggregated transportation services), "coordination" (e.g., coordinated supply chain logistics), "pooling" (e.g., pooling harvests), "cooperative" (e.g., food cooperatives), etc. Within local food systems, collaboration is used to improve important functions such as marketing, transportation, brokering, storage, packaging, and distribution.

The importance of collaboration is well documented in the literature (e.g. Alonso & Liu, 2012; Che et al., 2005; Dollahite, Nelson, Frongillo, & Griffin, 2005; Griffin & Frongillo, 2003), yet few studies have sought to understand how collaboration works in local food systems. Those studies that have examined collaboration in local food systems have primarily presented examples of collaborative initiatives (e.g., Conner, King, Kolodinsky, Roche, Koliba, & Trubek, 2012; Griffin & Frongillo, 2003; King et al., 2010; Stevenson, Clancy, King, Lev, Ostrom, & Smith, 2011), examined barriers to collaboration (e.g., Che et al., 2005; Starr et al., 2003; Vogt & Kaiser, 2008), or identified benefits of collaboration (e.g., Griffin & Frongillo, 2003; Izumi, Wright & Hamm, 2010; Wargenau & Che, 2006). Although valuable contributions to the literature, such studies do not address the motivations of different parties to participate in collaborative initiatives. Moreover, the studies do not address how each party might bene-

fit differently from a collaborative initiative. Regional food stakeholders have limited resources (e.g., time, money) that may inhibit their collaborative efforts (Starr et al., 2003). Stakeholders engaging in collaboration initiatives need to know that the resources they expend will ultimately provide beneficial outcomes that are important to them.

Discussions about the benefits of collaboration are important, but their utility is limited without a better understanding of how the different parties value those benefits. Because food systems have multiple players, and each player invests different levels of resources in a collaborative initiative, it stands to reason that each party places varying levels of value on the resulting outcomes. For example, farmers and farmers' market managers might work together on any number of collaborative initiatives within a local food system. Each of these initiatives, if successful, will likely generate positive outcomes, but because each participant has unique objectives, the farmers and the market managers will value those outcomes differently. Therefore each party will experience different levels of motivation to participate in any particular collaborative initiative. Collaboration is likely to occur when *each* participant has at least three things: an opportunity to collaborate, the resources needed to contribute to the collaboration, and the motivation to collaborate. With a better understanding of the motivations different food system players have to collaborate within local food systems, collaborative initiatives will have a better chance of maximizing positive outcomes for all involved, and therefore will be more likely to lead to the success of the food system.

Study Area

The location of this study is in southeast Michigan (defined as Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties, all in southeast Michigan) and was selected for several reasons. First, a local report focused on the Oakland County Farmers Market conducted in 2011 highlighted the need for a more in-depth analysis of the area and the local government's role in the development and support for a regional food system. As a result of that report, local government officials were interested in learning more about the specific barriers and facilitators of food system collaboration in the region. Additionally, southeast Michigan is the setting for several ongoing local food initiatives involving numerous stakeholders. Consequently, the region offers a relatively large population of potential subjects for a study of collaboration. Moreover, there is evidence that collaborative initiatives in southeast Michigan could be improved for various agri-food system entities (Che, Veeck, & Veeck, 2005), so the initiatives themselves would benefit from any findings that would help to make collaboration in the region more effective.

The U.S. state of Michigan is widely known for its agricultural diversity, being second in the U.S. only to California in diversity, and it is home to various regions where agriculture remains a significant segment of the economy. The agriculture sector employs over one million Michigan residents and contributes over US$73 billion to the state's economy (U.S. Department of Agriculture [USDA], 2010–2011). The southeast part of Michigan, which includes the Detroit metropolitan area and surrounding suburbs, is the most heavily populated and diverse part of the state.

Southeast Michigan encompasses many urban spaces that are close to rural and agricultural land, which is considered to be a strength for the development of a regional food system (Martinez et al., 2010). The area is currently working to develop a sustainable regional food system in spite of common infrastructural difficulties and a growing number of local food networks and food hubs that are not well integrated (Barham, Tropp, Enterline, Farbman, Fisk, & Kiraly, 2012). Southeast Michigan is home to two growing food hubs, Detroit Eastern Market Corporation and Harvest Michigan in Clarkston, Michigan, which are poised to help meet and grow the demand for local foods. Because population in this area is projected to increase for every county except Wayne County (Southeast Michigan Council of Governments [SEMCOG], 2012), the consumer base for growing demand and bolstering support for a regional food system is expected to increase. Complementing this increasing consumer base is the growing interest and development of farm-to-institution (FTI) programs. According to a study on FTIs in Southeast

Michigan, of the 80 institutions surveyed more than 75 percent purchased local foods in the previous year (Matts & Colasanti, 2013). Interest in farm-to-school programs is also on the rise in the region (Matts & Smalley, 2013), as well as interest in the potential of developing urban gardening and farming enterprises (Score & Young, 2008), kitchen incubators, grain processing facilities (Buck, Kaminski, Stockmann, & Vail, 2007), and additional businesses in the agri-food system.

The purpose of this exploratory study is to examine the suitability of expectancy theory to understand the factors that lead to motivation to collaborate among different types of local food system players. Expectancy theory (Vroom, 1964) is a motivation theory that is well suited for this context as it takes into account that different players may experience different levels of motivation for participation in collaborative initiatives, because the outcomes of those initiatives will be valued differently depending on each player's objectives.

Among the stakeholders that compose a regional food system, farmers and farmers' market managers were selected because the region has seen an increase in farmers' markets and a decline in agricultural land (SEMCOG, 2003). This contributes to an imbalance in supply and demand that potentially creates difficulty for both groups of stakeholders, thus making the need for effective collaboration increasingly important. These two entities also play a prominent role in local food systems, and it was hoped that there would be enough subjects from each group to provide useful results. The study itself uses expectancy theory to examine the motivation of farmers and farmers' market managers to participate in collaborative initiatives common to a local food system. Specifically, this study addresses the following research questions as guided by this theory:

1. How do farmers and farmers' market managers differ in their belief that collaboration will lead to positive outcomes?
2. How do farmers and farmers' market managers differ in their perceived value of the outcomes that result from collaboration?
3. What are the perceived barriers to collaboration for farmers and farmers' market managers?

The answers to these questions will help to understand differences in motivation that farmers and market managers have toward collaborating with one another. Findings could provide insights into strengthening collaboration between these two parties and could provide a framework for better understanding how motivation to collaborate may vary among different local food system players, an important step in developing more effective collaborative relationships and stronger, more sustainable food networks.

Literature Review

The theoretical and research literature on collaboration in local food networks has increased in recent years, but still does not adequately address the need for research in this area. Literature relating to expectancy theory has been used to study motivation in many contexts, but this theory has yet to be used in studies involving collaboration. Literature on collaboration does not present a general theory of collaboration that can be used for this study, but remains malleable to the "contexts, interests and applications to those who are defining it" (Elliott, 2007, p. 30). Therefore, literature was reviewed from agriculture, social sciences, and business and management research. Related literature was organized into the following topical areas: collaboration, motivations among local food stakeholders, and expectancy theory.

Collaboration

Organizations in many industries have long sought to improve their performance through strategic alliances with other organizations (Doz & Hamel, 1998; Wargenau & Che, 2006). These partnerships can occur horizontally (e.g., farmers' markets working together on an initiative) or vertically (e.g., farmers collaborating with schools as part of a farm-to-school program) (Michael, 2007; Mitchell & van der Linden, 2010). Collaboration involves relationships with many levels of communication, joint strategies, and accomplishments that contribute to a common product or goal (Bronstein, 2003; Dollahite et al., 2005). Considering the many ways in which collaboration is central to local food sys-

tems, the emergence of collaborative organizational structures such as food hubs, local food networks, and communities of practice around food systems comes as no surprise. Despite some differences in how these concepts logistically operate, the overarching similarity is that they all focus on developing partnerships and collaborations to advance a shared mission or purpose concerning local agriculture and food.

One line of collaboration research has identified barriers to collaboration. Che et al. (2005) found that because they are typically geographically isolated and often lack certain marketing skills, farmers who interact directly with consumers have a greater need to participate in collaborative marketing initiatives, compared to those who grow commodity crops. Vogt and Kaiser (2008) identified lack of infrastructure, financial support, and institutional support as barriers that inhibit collaborative efforts even if local food system stakeholders are willing to collaborate. For the parties that do engage in collaborative efforts, activities are often limited due to issues such as reliability, convenience, seasonal constraints, and price (Starr et al., 2003).

The few studies that explore collaboration in local food systems typically focus on supply or value chains, likely because this is a common approach of studies of collaboration in conventional and commodity-based agriculture (Bloom & Hinrichs, 2011). Supply chain analysis addresses five major areas: (1) the nature of the production process; (2) the economic and social organization of food production; (3) the use and management of labor; (4) the role of scientific research and extension activities; and (5) the organization of marketing and distribution activities (Buttel, Larson, & Gillespie, 1990, as cited by Murdoch, 2000). Although these areas focus on important collaborative activities, successful collaboration also requires an understanding of relational and motivational issues among local food system stakeholders (Matopoulos et al., 2007).

In their work on values-based supply chains, Stevenson and Pirog (2008) identify trust as an important component in successful value-chain relationships. Without trust, a successful and lasting collaborative relationship is unsustainable. Others have also mentioned the importance of trust in collaborative relationships (e.g., Ambrose, Marshall & Lynch, 2010); however, there has been no research into how trust is fostered among local food system stakeholders, and, more importantly, how it impacts the motivation of local food system stakeholders to collaborate.

Although few studies have focused on collaboration in local food systems, even fewer studies have addressed the motivation to collaborate in local food systems. In an effort to identify the motivations for collaboration in a wine region in Michigan, Wargenau and Che (2006) interviewed winery owners and identified benefits to collaboration for marketing and promotion, such as increased publicity and pooling money for promotional initiatives that none of the wineries could do on their own. Alonso and Liu (2012) found that collaborating in a local food network could help to bring recognition to a region, thereby building the region's brand. Although these studies make valuable contributions by identifying benefits of collaboration, they do not specifically address the factors that impact motivation to collaborate.

Motivation Among Local Food System Players

Izumi, Wright, and Hamm (2010) examined farmers' motivations to participate in farm-to school programs and found that they sold their products to schools to diversify their distribution channels and for social reasons (e.g., to improve children's access to nutritious foods and support the local community). Conner et al. (2012) also examined farmers' motivation for involvement with farm-to-school programs and similarly found that their participation was driven by both economic and social motivations.

Building on the notion that farmers are at least somewhat motivated by factors other than economic ones, several studies have examined farmers' motivations toward environmental activities such as organic farming, compliance with environmental regulations, and land protection. Peterson, Barkley, Chacon-Casante, Kastens, Marchant, and Bosch (2012) found that organic grain and soybean farmers in the U.S. were motivated to produce organic products by multiple factors, including economic and environmental ones, and that younger farmers

were more likely to be motivated by environmental and lifestyle factors than older farmers. Ryan, Erickson & De Young (2003) surveyed Michigan farmers to learn about their motivations for adopting conservation practices and found that rather than economic reasons, farmers were intrinsically motivated to adopt conservation practices because of their attachment to the land. In another study that examined economic and intrinsic motivations for farmers' stewardship behaviors, Chouinard, Paterson, Wandschneider, and Ohler (2008) found that farmers are willing to forego some financial benefits in order to engage in eco-friendly farm practices. All of these studies provide evidence that in addition to economic motivations, social and environmental ones also influence farmer behavior. Because the environmental and social benefits of local food networks are well known, these studies are helpful in understanding farmers' motivations to participate in local food systems.

Although the above studies have advanced the understanding of important topics such as the benefits of collaboration and the identification of farmers' motivations for environmental behaviors, they do not provide a theoretical explanation for the motivations that drive behaviors. This study uses the expectancy theory of motivation (Vroom, 1964) to understand the motivations that drive different parties' participation in collaborative initiatives.

Expectancy Theory

Expectancy theory uses intrinsic and extrinsic motivators to explain the driving force to make certain choices to achieve a particular goal (Friedman, Cox, & Maher, 2008). Although originally used to understand the motivation of individuals in the workplace (Vroom, 1964), expectancy theory has also been used to understand the behavior of organizations (e.g., Chen & Miller, 1994; Mobley & Meglino, 1977; Wei, Frankwick & Nguyen, 2012).

The theory involves two major concepts: expectancy and valence (Andereck, McGehee, Lee, & Clemmons, 2012). Expectancy is the belief that effort, or dedication of resources, will lead to a certain outcome or goal (Lawler, 1973). Valence is the value a person places on the outcome (Hancock, 1995; Vroom, 1964). Together, expectancy and valence combine to determine motivation toward a task or initiative (Isaac, Zerbe, & Pitt, 2001). According to the theory, if an individual or organization does not believe that applying resources toward a specific task or initiative will result in a certain outcome, or if they do not value that outcome, they will be less motivated to participate in the initiative. This principle demonstrates the value of expectancy theory in understanding motivation to collaborate in local food systems. Any particular collaborative initiative in a local food system will require some level of resource investment (likely time and/or money) from multiple parties. However, if one party is not as convinced that the initiative will lead to the stated outcome, it follows that they will be less motivated to contribute, thereby weakening the chance of success of the initiative. Additionally, even if each party believes that the initiative will deliver the stated outcome(s), if a party does not value that outcome as much, according to expectancy theory, it will be less motivated to contribute resources to the initiative. Researchers have identified the benefits of collaboration in local food systems; however, there has been no recognition that those benefits might be valued differently by different players in a local food system (for instance, farmers and farmers' market managers).

Method

Instruments

The researchers collected data by administering two survey questionnaires: one given to farmers and one to farmers' market managers (hereafter referred to as "FM managers"). (See the FM managers' survey in the Appendix.) The surveys were similar and only varied from each other in language and choices that were only appropriate for the specific audience. The instruments were based on previously published study instruments that used expectancy theory (for example, Turcan, 2010) that were modified to respond to the context of this research. Face validity involves subjectively evaluating a survey instrument to ensure it covers the concept it purports to measure. To ensure face

validity for this study, both survey instruments were reviewed by Michigan State University (MSU) faculty, independent subject matter experts, and graduate students. Vroom's (1964) expectancy theory is used as the framework for the questionnaire, with the goal of understanding participants' motivations to collaborate with other local food system stakeholders.

The surveys each contained 25 questions with 23 Likert-type questions with predefined choices. Because using a participant's own outcomes is suggested when using expectancy theory to measure motivation (Mitchell, 1974), researchers conducted a review of literature relevant to local/regional food systems and collaboration to identify common outcomes, such as increased revenue, increased time for other business activities, increased sense of community, improved relationships among the food system community, and improved reputation (Ambrose et al., 2010; Feenstra, 1997; Pirog & Bregendahl, 2012; Stevenson & Pirog, 2008). These outcomes were used to create scales to measure expectancy and valence.

Questions were designed to measure a participant's belief that engaging in collaborative initiatives with other food system stakeholders will lead to a desired outcome (expectancy). A five-point Likert-type scale was used with numerical values ranging from one to five and value description anchors ranging from never to every time. Variables were analyzed using frequencies and descriptive statistics. Mean values were computed for all participants for each variable (i.e., expectancy) and t-tests were used to compare means. Cronbach's alpha was used to measure the reliability of the expectancy and valence scales for both the farmer and FM manager surveys. A Cronbach's alpha score of .70 or higher is considered an acceptable reliability level. The valence scale for farmers had a value of .87 and the expectancy scale had a value of .77. The valence scale for FM managers had a value of .83 and the expectancy scale had a value of .75.

Study Participants

Researchers tried to engage as many farmers and FM managers in the region as possible to participate in the study. A list of all farmers and farmers' markets located within the study area was compiled using Internet searches of databases including, but not limited to, the Michigan Farmers' Market Association (MIFMA) database, the Local Harvest database, and Real Time Farms.com. Additionally, researchers received and consolidated contact lists from MSU Extension, Oakland County, and Detroit's Eastern Market Corporation. The final list included 147 farms and each of the 90 farmers' markets in the study area. All the farmers and FM managers from these were invited to participate in this study.

Because of the limited number of subjects available to participate in this study, it was important to achieve as strong a response rate as resources would allow. Other studies that surveyed farmers have experienced low response rates (e.g., 21.9 percent by Peterson et al., (2012) and 20 percent by Ryan, Erickson, & De Young, (2003)). In a study investigating the notoriously low survey response rates of farmers, Pennings, Irwin, and Good (2002) found that providing incentives, creating shorter surveys, and choosing the right time of year can help to increase response rates. The survey for this study was developed to be as short and concise as possible, but there was very little flexibility for changing the study period and there were not enough financial resources to offer meaningful incentives. To encourage responses, researchers used the Dillman Total Design method (Dillman, Smyth, & Christian, 2009) to contact farmers and farmers' markets in the study area. Participants were sent a paper letter or an email introducing the study, followed by the survey with a stamped return envelope three days later. A reminder postcard was sent five days later, and a final contact, which included a final letter of invitation and an additional copy of the survey with a stamped return envelope was sent seven days after the postcard was distributed. Using this method, researchers achieved an overall response rate of 33 percent. Although this is better than many studies, it was lower than researchers hoped for, especially given the small sample size.

Results

A total of 237 surveys were sent out, 90 to FM managers and 147 to farmers; 21 of the invitations

to farmers were returned as undeliverable. The response rate was 38 percent for FM managers and 30 percent for farmers. Among the farmer respondents, the majority were male (74.3 percent) and the average years of experience in farming was 17.5 years. Among the FM manager respondents, the majority were female (87.5 percent) with an average of 4.6 years of experience as a FM manager. The majority of both groups were over the age of 50. Regarding education, 47.3 percent of farmers had at least a bachelor's degree, compared to 72.7 percent of FM managers. (See Table 1 for all respondent demographics.) Some of these differences among the two groups, such as gender, are striking and as will be discussed later, make attribution of the reasons for any differences in motivation impossible to understand with certainty.

Table 1. Respondent Demographics

	Farmers *(N = 37)*	Farmers' Market Managers *(N = 33)*
Male	74.3%	12.5%
Female	25.7%	87.5%
Age		
20–29	10.8%	16.0%
30–39	5.4%	9.7%
40–49	16.2%	19.4%
50–59	48.6%	32.3%
60+	19.0%	22.6%
Years of Experience (Average)	17.5	4.6
Education Level		
Less than 12 years	5.3%	0%
High School/GED	15.8%	6.1%
Some College	31.6%	21.2%
College Graduate	34.2%	42.4%
Advanced Degree	13.1%	30.3%

Subjects were asked how important they think collaboration is to local food movements. More FM managers than farmers felt that collaboration is more important, with 71 percent of FM managers indicating that collaboration is important or very important to local food movements, compared to just 47.2 percent of farmers.

To help understand the extent to which farmers and FM managers face different obstacles to collaboration, subjects were asked to indicate the barriers that inhibit their partnering with other food system stakeholders. Overall, farmer respondents indicated a greater number of barriers (M = 2.12) than did FM managers (M = 1.67) when it comes to collaborating with other food system stakeholders (see Table 2). The most frequently cited barrier for both farmers and FM managers was lack of time for collaboration. Of the reasons provided on the survey, the *least* cited barrier to collaboration with other food system stakeholders was "Other collaborators would benefit more than I/the market would," suggesting that a concern about "freeloaders" is not a major barrier to collaboration among respondents. All of the barriers provided were identified by a higher percentage of farmers than FM managers. Three barriers in particular were identified by a significantly higher percentage of farmers than FM managers: "The costs outweigh the benefits"; "I don't benefit enough from partnering/collaborating with others"; and "Depending on others is too risky."

Both farmers and FM managers were asked about their experience participating in a variety of collaborative initiatives (see Table 3). For farmers, participation in collaborative initiatives is largely

Table 2. Respondent Barriers to Collaborating

	Farmers *(N = 33)*	Farmers' Market Managers *(N = 24)*
I don't have the time	39.5%	38.2%
I am not sure of the benefits	34.2%	26.5%
Depending on others is too risky	34.2%	2.9%
The costs outweigh the benefits	31.6%	11.8%
I don't benefit enough from partnering/collaborating with others	28.9%	5.9%
Other	10.5%	20.6%
Other collaborators would benefit more	7.9%	5.9%
Mean Number of Barriers Cited Per Respondent	*2.12*	*1.67*

Table 3. Participation in Collaborative Initiatives

	Farmers *(N = 38)*	Farmers' Market Managers *(N = 34)*
Selling product at a farmers' market	60.5%	n/a
Participating or supporting an event (financially or nonfinancially) to promote yourself or other food system stakeholders	42.1%	61.8%
Actively advocating for policy change that supports sustainable farming or agriculture	28.9%	23.5%
Engaging in or supporting research (financially or nonfinancially) in support of local and sustainable food systems	10.5%	29.4%
Other	10.5%	2.9%
Participating in local food policy councils	7.9%	23.5%
Combining product with other farmers to sell to larger local buyers (e.g., food hubs)	5.3%	n/a
Opening your market venue for others to use	n/a	47.1%
Helping farmers combine their product to sell to larger local buyers (e.g., institutional buyers)	n/a	14.7%

focused in three areas: selling product at a farmers' market (60.5 percent), engaging or supporting an event (financially or nonfinancially) to promote themselves or other food system players (42.1 percent), and actively advocating for policy change that supports sustainable farming or agriculture (28.9 percent). FM managers indicated participation in a wider range of collaborative initiatives, with the highest number indicating that they had participated in or supported events (financially or nonfinancially) to promote themselves or other food system stakeholders.

To measure the concept of expectancy (whether investment of resources toward collaboration would lead to positive outcomes), we presented subjects with a list of positive outcomes that might result from collaboration with other local food system players. Subjects were asked to indicate how often they would expect to experience each outcome as a

Table 4. Motivation to Collaborate: Expectancy

	Mean and Standard Deviation	Farmers *(N = 34)*	Farmers' Market Managers *(N = 32)*	t *(df = 64)*	*p*
Contributing to community	M	3.80	4.35	–2.669	.010
	SD	.816	.573		
Strengthening relationships	M	3.58	3.87	–1.061	.294
	SD	.830	1.1014		
Increasing knowledge of local food systems	M	3.54	4.26	–3.348	.002
	SD	.833	.619		
Spending less time marketing	M	3.38	2.91	2.542	.015
	SD	.647	.596		
Increasing return on investment (financial or nonfinancial)	M	3.29	3.43	–.595	.555
	SD	.751	.896		
Having more time	M	3.29	3.04	.980	.332
	SD	.624	1.065		
Increased work effectiveness	M	3.08	3.61	–2.218	.032
	SD	.640	.988		
Total Expectancy	*M*	*3.45*	*3.60*	*–2.096*	*.042*
	SD	*.253*	*.218*		

Table 5. Motivation to Collaborate: Valence

	Mean and Standard Deviation	Farmers *(N = 25)*	Famers' Market Managers *(N = 23)*	t *(df =46)*	*p*
Contributing to community	M	3.91	4.13	–1.098	.276
	SD	.887	.670		
Strengthening relationships	M	3.79	3.94	–.686	.495
	SD	.808	.854		
Increasing knowledge of local food systems	M	3.59	4.16	–3.239	.002
	SD	.701	.723		
Spending less time marketing	M	3.53	3.40	.428	.670
	SD	1.107	1.303		
Increasing return on investment (financial or nonfinancial)	M	3.76	3.97	–1.126	.264
	SD	.708	.765		
Having more time	M	3.82	3.77	.174	.863
	SD	1.185	1.165		
Increased work effectiveness	M	3.65	3.84	–.787	.434
	SD	1.041	.987		
Total Valence	*M*	*3.74*	*3.89*	*–1.124*	*.265*
	SD	*.349*	*.692*		

result of collaborating, on a five-point scale, with one being "Never," five being "Every Time," and "Sometimes" in the middle.

For farmers, the mean score for each outcome was above 3, suggesting that farmers thought that collaboration could lead to each of the presented positive outcomes at least sometimes (see Table 4). The initiatives with the highest expectancy for farmers were contributing to their community (M = 3.80) and strengthening their relationships with other food system players (M = 3.58). The outcome with the lowest expectancy for farmers was increased work effectiveness (M = 3.08).

FM managers showed mean scores above 3.0 for all but one outcome: spending less time marketing (M = 2.87), suggesting that FM managers would not expect collaboration to lead to this outcome very often. The outcomes with the highest expectancy among for FM managers are contributing to their community (M = 4.35), and increasing their knowledge of local food system (M = 4.22).

We used T-tests to compare the mean scores that farmers and FM managers reported for each of the collaboration outcome items presented in the survey. Although we were concerned that the low number of responses (N) might make it impossible to discern significant differences, the variance in the means between the farmers and FM managers for four of the seven items were found to be statistically significant. Moreover, the variance in the means for the overall total expectancy scores between the two groups was also statistically significant.

To measure valence (the value placed on an outcome), we asked subjects to indicate the extent to which each of the positive outcomes mentioned above would help his or her farm or farmers' market. Subjects selected from a five-point scale with one being "Not Helpful," five being "Very Helpful," and "Neutral" in the middle.

Both farmers and FM managers had a mean score over three for each possible outcome presented suggesting that both groups identified at least some value for each outcome (see Table 5). FM managers had a slightly higher overall average (M = 3.89) than famers (M = 3.74); however, t-tests did not show a significant difference between these means. The two outcomes with the highest valence for farmers were contributing to their community (M = 3.91), and having more time (M = 3.82). The outcomes with the most valence for

Table 6. Motivation to Collaborate: Expectancy × Valence

	Mean and Standard Deviation	Farmers *(N = 25)*	Farmers' Market Managers *(N = 23)*	t *(df = 46)*	*p*
Contributing to community	M	16.21	17.61	–.704	.485
	SD	7.690	5.774		
Strengthening relationships	M	14.17	15.22	–.616	.541
	SD	5.331	6.135		
Increasing knowledge of local food systems	M	13.96	17.22	–2.232	.031
	SD	4.695	5.090		
Spending less time marketing	M	12.09	10.30	1.039	.304
	SD	5.861	5.772		
Increasing return on investment (financial or nonfinancial)	M	12.52	13.39	–.570	.572
	SD	5.053	5.289		
Having more time	M	13.09	11.87	.695	.491
	SD	4.870	6.851		
Increased work effectiveness	M	11.71	13.3913	–2.091	.042
	SD	2.866	2.641		
Total Motivation	M	12.77	14.096	–2.294	.027
	SD	2.062	1.892		

FM managers were increased knowledge of local food systems (M = 4.16) and contributing to their community (M = 4.13).

According to expectancy theory, motivation is the result of the combination of expectancy and valence. Table 6 shows the result of multiplying the mean scores for expectancy by the mean scores of valence (as is consistent with other uses of expectancy theory measures), the difference in these numbers between farmers and FM managers, and the results of t-tests to measure the significance of these differences. Results show that contributing to community, increasing knowledge of local food systems, and strengthening relationships are the outcomes that generate the highest values of total motivation for each group. Two (increasing knowledge of food systems, and contributing to community) show the greatest discrepancy between the farmers and FM managers, but the t-test only showed a significant difference in the means for increasing knowledge of food systems. Also, the t-test showed a significant difference between the mean total motivation scores for the famers and FM managers, suggesting that with regard to the outcomes presented in the survey, farmers are less motivated to collaborate than FM managers.

Discussion

This study examined the motivations to collaborate among two different groups of players in a local food system through the theoretical lens of expectancy theory. Because collaboration relies on the contributions of different parties that have different objectives, expectancy theory is particularly well suited to understand motivation in this context. The expectancy component of the theory can help understand whether different parties believe a particular collaborative initiative will result in positive outcomes. The valence component shows the value different parties place on those outcomes. Together these two components provide insight to the motivation to collaborate on different initiatives.

Results showed that for both groups, the overall scores for valence exceeded the overall scores for expectancy. This suggests that both groups value the potential outcomes of collaboration more than they expect collaboration to lead to those outcomes. Therefore efforts to overcome barriers to collaboration might be more successful if they focus on steps to ensure the success of the collaborative initiatives (or on communicating the likelihood of success) more than on emphasizing the

value of the outcomes. One challenge in doing this, however, is that the mean overall expectancy levels for each group (as well as the expectancy levels for four of the seven potential outcomes) are statistically different. In other words, farmers and FM managers have different levels of confidence that collaboration will lead to the listed outcomes. These results show the important need for communication between all parties considering collaboration. Effective communication about each party's specific objectives and the potential outcomes of a collaborative initiative can lead to a collaboration that maximizes the motivation for each party.

Collaboration that emphasizes outcomes that both groups value and believe are achievable creates a "win-win" scenario that is more likely to be successful because both parties will be motivated to invest the needed resources. The results of this study showed that collaborative initiatives that have the goals of helping both parties save time, increase their return on investment (ROI), spend less time marketing, contribute to community, and build relationships will have similar levels of motivation among farmers and FM managers because the mean scores for these items are not statistically different. In addition to helping to identify collaborative initiatives that offer these outcomes, understanding each party's motivation can help to convince a skeptical participant to collaborate by communicating anticipated benefits that are valued by the unconvinced party.

This study also shows that certain collaboration outcomes generate different levels of motivation for each party. For instance, FM managers are much more motivated than farmers by collaborative initiatives that result in increased knowledge of local food systems and increased work effectiveness. Farmers, on the other hand, are more motivated than FM managers by initiatives that result in spending less time marketing, though that difference is not statistically significant. Understanding the motivation levels tied to specific outcomes can be useful to anyone trying to encourage collaboration between these groups. Any collaborative initiative has the potential to produce multiple positive outcomes. When attempting to encourage collaboration, however, the outcomes that produce higher motivation levels for a specific group should be emphasized in discussions with that group.

This concept does not necessarily mean that the outcomes that generate different levels of motivation among groups should be downplayed in discussions with those groups. For example, this study showed that FM managers have a statistically higher level of motivation than farmers for collaboration that results in increased knowledge of local food systems. Despite this motivation gap, initiatives that result in increased knowledge of local food systems will still motivate farmers more than most of the other outcomes. Although this might seem contradictory, it is because FM managers have overall higher levels of motivation than farmers for the outcomes that result from collaboration. Therefore, although FM managers might have higher levels of motivation than farmers for collaborations that lead to increased knowledge of local food systems, this outcome is still highly valued by farmers and will likely find high levels of motivation from each party. This may not be the case in situations where parties are concerned about equity, as "free-riding" has been identified as a potential barrier to collaboration in some settings (e.g., Chaudhuri, 2008; Smith, Peirce & Ricci, 2011). However, the present study showed that freeloaders are not a significant barrier to collaboration in local food systems.

As noted above, FM managers have overall higher levels of motivation for collaboration than farmers. It is certainly possible that farmers are simply less interested in collaboration. In a study of English farmers, Gasson (1973) showed that farmers value their independence and way of life more so than social (collaborative) aspects related to their work. It is also possible that there are other reasons why farmers showed less motivation to collaborate than FM managers. Although the results of this study cannot fully explain this discrepancy, it does reveal some other potential explanations. First, it is possible that other differences among the respondent groups are responsible for the motivation gap. About three-quarters of the farmer respondents were male, while 88 percent of the FM managers were female. It is therefore possible that the different motivation levels

for collaboration are the result of gender rather than participant group. Similarly the survey showed a large difference in education levels, with 73 percent of FM managers having at least a bachelor's degree compared to 43 percent of farmers. Perhaps the motivation gap is the result of this difference in education levels. This difference in education levels could also explain why FM managers believe they get a better return on investment from research than farmers do. Many studies have shown differences in motivation based on gender and education level, but results vary dramatically based on the context. We were unable to find other studies that examined the effects of gender or education level on motivation to collaborate in a context similar to this study. Lastly, results also showed that FM managers had more experience collaborating than farmers. It is therefore possible that experience with collaboration leads to higher motivation levels for future collaboration. Vroom (1964) explained that there is a difference between anticipated satisfaction with outcomes and actual satisfaction with outcomes. If FM managers with more experience collaborating have found their actual satisfaction with the outcomes to be greater than anticipated, their motivation might be higher as a result.

Although the low overall number of responses limits the ability to conduct further statistical tests to better understand the extent to which differences in motivation are the result of variables such as occupation, gender, education level, or experience with collaboration, the striking differences in these areas are among the most interesting findings from this study. Furthermore, the differences in motivation levels among the groups reinforce that a scale that measures expectancy and valence is able to show motivational differences among groups, even if it is not yet clear from this study which variables are most responsible for those differences. This finding as much as any other is important for informing future research, which could use an expectancy theory–based instrument such as this to further examine the reasons for the motivation differences among groups. Such research could provide important insights into strengthening local food systems by making collaboration more effective.

Implications for Practitioners

The results of this study highlight the importance of framing and communicating reasons to collaborate differently for specific stakeholders involved in various collaborative initiatives. The following are implications and recommendations that stem from this study for specific food system stakeholders such as farmers, farmers' market organizers and managers, associations, community planners, local government officials, and any other entity that might help to facilitate collaboration between farmers and farmers' markets.

1. Better understanding of which outcomes farmers and FM managers believe are achievable through collaboration, and which outcomes are most valued by each group, can help anyone trying to encourage collaboration in at least three ways. First, this knowledge can help to prioritize which collaborations should be pursued, with the ones most likely to maximize motivation — and therefore most likely to be successful — being pursued first. This is especially important given the time concerns indicated by both groups. Second, better understanding of how each group values specific outcomes can help inform the communication that is used to persuade potential participants to collaborate by emphasizing specific messages important to each group. Third, understanding the gaps in motivation that different groups have for certain outcomes can help those trying to encourage collaboration to adjust expectations about resource commitment to ensure less is expected of those who do not expect to benefit as much from the collaboration.
2. Because farmers cited lack of time as the top barrier to collaboration, those trying to recruit participants for collaborative initiatives should acknowledge the value of farmers' time when trying to encourage collaboration, and emphasize how collaboration could result in time savings.
3. It is important to focus on clearly communicating the benefits of collaboration with farmers, since 34 percent of respondents are not sure of the benefits and 29 percent feel

they do not benefit from collaborating. Benefits communicated should include benefits to the farmers, the market, the community, and the larger food system region, since "feeling like I'm contributing to my community" was reported as the most valued benefit to collaboration for farmers and nearly the most valued for FM managers.

4. Because FM managers indicated they are motivated to open their market venue for others to use, we suggest that farmers communicate their needs to the markets they participate at and/or sell product at to discern how the market can help farmers grow and develop new products (farmers' second most valued benefit when engaging in collaboration). Some examples of this include the farmers' market setting up an incubator kitchen for farmers to use or rent to develop value added products, or providing a space for farmers to distribute community supported agriculture (CSA) shares to customers, allowing them to diversify their business through a CSA program.
5. Since FM managers reported that their greatest ROI is "engaging in or supporting an event (financially or nonfinancially) to promote themselves or other food system stakeholders," we suggest that farmers pursue support from their local farmers' markets to create events relevant to their needs. For example, since 29 percent of farmers reported that they collaborate by "actively advocating for policy change that supports sustainable farming and agriculture," farmers' markets could be used to host events to increase awareness and support for policy changes within the community.
6. Because both farmers and FM managers reported relatively high mean scores for expectancy, both groups believe their investment in collaboration will lead to positive outcomes. Parties trying to encourage collaboration should therefore ensure that those outcomes are likely to be valued by those collaboration participants.
7. Because over 30 percent of farmers responded that collaboration "is too risky," those championing collaboration should focus on building trust when collaborating. Trust can be built by providing farmers some control when collaborating, or implementing a contract or policy that formalizes outcomes that farmers desire or value.

Implications for Researchers

1. Future studies could investigate the reasons for the motivation discrepancy related to collaboration that exists between the groups. Additionally, studies could investigate the motivations of other local food network players. Because expectancy theory is a useful lens through which to understand motivation to collaborate in this context, the scales used in this study, which were found to be reliable, could be used in other contexts. Future studies could also investigate whether collaboration is actually producing the intended outcomes, and could evaluate whether the actual outcomes are valued as much as had been anticipated.
2. Because both groups reported low ROI on participating in research, researchers need to do a better job linking the results of their studies to practical and actionable information that can benefit stakeholders in local food networks. Researchers need to be thoughtful about their outreach efforts to ensure that this information reaches and is understood by appropriate stakeholders.

An obvious limitation of this study is the low number of respondents. Although the overall response rate of 33 percent is better than many other surveys in a similar context, the reader must use caution when interpreting the results. Although some of the t-tests showed significant *p*-values, other differences between means (especially those with the higher standard deviations) may have shown significance with a greater number of responses. For this reason, we were cautious, claiming that a lack of statistically significant variation meant that there were no differences between the compared groups. This study, however, was meant to be exploratory, and exploratory studies often have limited generalizability. Therefore,

despite the low number of respondents, we believe that this study sufficiently serves the purpose of helping to determine that expectancy theory is indeed a worthy theoretical framework for understanding motivation of local food system players to engage in collaboration.

Conclusion

Collaboration is vital to the success of local food systems; however those who must collaborate have limited time and financial resources to contribute to collaborative initiatives. Because of this, they will not have high motivation to participate in every collaborative initiative that is proposed. For this reason a more strategic approach to collaboration is required to focus opportunities for collaboration on the initiatives that are likely to have the highest levels of motivation among participants. Doing so will help to ensure that food system players find greater value from collaboration, thereby leading to a culture where collaboration is supported. This study provided some insights into the factors that impact the motivation to collaborate for two of the most important players in local food systems: farmers and farmers' market managers. These results can help local food system stakeholders to more wisely implement collaborative initiatives and can ultimately strengthen local food systems.

Equally important, this study showed that by using a survey instrument based on expectancy theory, it is possible to identify variations in motivation among the different participants in collaboration, a concept that has not yet been addressed in the local foods literature. Although it may seem obvious that different players would have different levels of confidence in the likely success of collaborative initiatives (expectancy), and that each player would place different value on the outcomes of those initiatives (valence), sometimes an easy-to-grasp framework such as this can help stakeholders improve the effectiveness of something like a collaboration initiative.

Acknowledgments

We give special thanks to Oakland County Parks and Recreation and the Michigan Economic Development Corporation (MEDC) for their contributions and support in making this research possible. And much gratitude to the many farmers and farmers' market managers for their voluntary participation in this study.

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Appendix. Survey Instrument for Farmers' Market Managers

(Note: Some formatting changes were made to fit the layout. No questions were modified.)

Dear Farmer Market Manager,

I am reaching out to you to collect information that will help create a clear picture of the bridges and barriers for food system players and stakeholders to collaborate in Southeast Michigan.

***You must be 18 years of age or older in order to participate in this survey. Your participation is completely voluntary and you may withdraw your participation at any time. Thank you in advance for being part of this study and helping to strengthen Southeast Michigan's local and regional food systems.**

Contact Information for Questions and Concerns:

If you have any questions about your role and rights, such as scientific issues, how to do any part of it, or to report an injury, please contact the research: Crystal Miller, Department of CARRS, Michigan State University, 131 Natural Resources Bldg., 480 Wilson Rd., East Lansing, MI 48824-1115; mill1879@msu.edu; (517) 353-0803.

If you have any questions about your role and rights as a research participant, or would like to register a complaint about this study, you may contact, anonymously if you wish, the MSU's Human Research Protection Programs, at (515) 355-2180, FAX (517) 432-4503, or e-mail irb@msu.edu, or regular mail at Olds Hall, MSU, East Lansing, MI 48824.

By checking the box, I agree to participate in the survey. ☐

1) Please select any of the following activities in which you have partnered/collaborated with other food system players/sectors (e.g., other farmers' market managers, processors) (Please check all that apply)

☐	Opening your market venue for others to use (i.e. CSA pick-up for farmers)
☐	Engaging in or supporting an event (financially or non-financially) to promote yourself or other food system players
☐	Engaging in or supporting an event (financially or non-financially) in support of local and sustainable food systems
☐	Helping farmers combine their product to sell to larger local buyers (e.g. institutional buyers)
☐	Participating in local food policy councils
☐	Actively advocating for policy change that supports sustainable farming or agriculture
☐	Other (Please specify):
☐	No, I have not partnered or collaborated with other food system players/sectors

If you have not partnered/collaborated, please skip to QUESTION 5.

2) We are interested in the return on investment you receive from collaboration with other food system players/sectors. Please consider the FINANCIAL AND NON-FINANCIAL contributions you have made, as well as the FINANCIAL AND NON-FINANCIAL benefits you have received from collaborating, and rate the investment from a poor return (1) to an excellent return on investment (5).

	Very Poor Return on Investment 1	2	Neutral 3	4	Excellent Return on Investment 5
Opening your market venue for others to use.	☐	☐	☐	☐	☐
Engaging in or supporting an event (financially or non-financially) to promote yourself or other food system players.	☐	☐	☐	☐	☐
Engaging in or supporting research (financially or non-financially) in support of local and sustainable food systems.	☐	☐	☐	☐	☐
Helping farmers to combine their product to sell to larger local buyers (e.g. institutional buyers).	☐	☐	☐	☐	☐
Participating in local food policy councils.	☐	☐	☐	☐	☐
Actively advocating for policy change that supports sustainable farming or agriculture.	☐	☐	☐	☐	☐
Other (please specify):	☐	☐	☐	☐	☐

3) Please list the FINANCIAL AND NON-FINANCIAL contributions you have made, or may make, when collaborating with other food system players:

Please share:

4) We are interested in the benefits you expect to see from partnering/collaborating with other food system players/sectors. Please use the scale below, with one (1) being never and five (5) being almost always.

Partnering/collaborating with other food system players/sectors will…

	Never 1	2	Sometimes 3	4	Every Time 5
…result in me spending less time on marketing the farmers' market.	☐	☐	☐	☐	☐
…allow me to increase the return of investment for the market (e.g. financial or non-financial).	☐	☐	☐	☐	☐
…allow me more time to develop new programs, events, etc. at the market.	☐	☐	☐	☐	☐
…help strengthen my relationships with other food system players/sectors.	☐	☐	☐	☐	☐
…help me feel like I'm contributing to my community.	☐	☐	☐	☐	☐
…increase my knowledge of local food systems so I can better educate vendors and customers.	☐	☐	☐	☐	☐
…help me be more effective in my field work.	☐	☐	☐	☐	☐

5) Which of the following benefits would *help the farmers' market* the most in a partnership/collaboration with other food system players/sectors?

	Not Helpful 1	2	Neutral 3	4	Very Helpful 5
Spending less time marketing the market.	☐	☐	☐	☐	☐
Increasing my return on investment (e.g. financial or non-financial).	☐	☐	☐	☐	☐
Having more time to develop new programs or business ventures for the market	☐	☐	☐	☐	☐
Strengthening my relationships with other food system players/sectors.	☐	☐	☐	☐	☐
Increased access to other food system players/sectors (e.g. consumers, distributors)	☐	☐	☐	☐	☐
Having a better reputation within our local food community.	☐	☐	☐	☐	☐
Increasing my knowledge of local food systems so I can better educate vendors and customers.	☐	☐	☐	☐	☐
Helping me be more effective in my field of work.	☐	☐	☐	☐	☐

6) Please indicate how interested you are to engage in any of the following activities on *behalf of the market.*

	Not at all 1	2	Neutral 3	4	Very much 5
Opening your farmers' market venue for others use (i.e. CSA pick-up for farmers).	☐	☐	☐	☐	☐
Helping farmers combine product to sell to large, local institutional buyers.	☐	☐	☐	☐	☐
Financially contribute to an event that promotes the market or other partners.	☐	☐	☐	☐	☐
Volunteer your time or other non-financial resources for joint local marketing efforts.	☐	☐	☐	☐	☐
Jointly fund marketing that promotes your local/regional food system.	☐	☐	☐	☐	☐
Contribute support (financial or non-financial) to build local food distribution infrastructure.	☐	☐	☐	☐	☐
Contribute support (financial or non-financial) to advocate for policy change that supports a sustainable local/regional food system.	☐	☐	☐	☐	☐

7) Considering the benefits, costs, and risks to collaboration, are there ways you prefer to interact with other food system players? Check all that apply.

☐ I avoid other food system player's requests to collaborate.

☐ I agree to collaborate, but don't really participate.

☐ I prefer to be a leader instead of working collaboratively.

☐ I prefer to focus more on being a competitive food system player, rather than a collaborator.

☐ Other ***(please specify):***

8) If you do not collaborate, please select all the reasons why. Check all that apply.

- ☐ I don't have the time.
- ☐ My costs to collaborate outweigh the benefits.
- ☐ I am not sure of the possible benefits.
- ☐ Other collaborators would benefit more than the market would.
- ☐ The market doesn't benefit enough from partnering/collaborating with others.
- ☐ Depending on others is too risky.
- ☐ Other (please specify):

9) Please rate how interested you are in local food movements.

	Not at all Interested 1	2	Neutral 3	4	Very Interested 5
Level of interest	☐	☐	☐	☐	☐

10) How important do you think collaboration is to local food movements?

	Not at all Important 1	2	Neutral 3	4	Very Important 5
Collaboration	☐	☐	☐	☐	☐

11) Thinking about all the ways to collaborate, to what extent do you agree or disagree with the following statement.

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
The more effort I give to collaborating, the more benefits I will receive.	☐	☐	☐	☐	☐

12) Farmers' markets play many roles; please indicate the extent to which you agree or disagree with the following:

Farmers' markets should…	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
…ensure customers have freedom to explore the market without purchasing anything.	☐	☐	☐	☐	☐
…work to make the farmers market a place where people can socialize.	☐	☐	☐	☐	☐
…help educate customers about the local food system.	☐	☐	☐	☐	☐
…make sure the farmers market is an enjoyable experience for customers.	☐	☐	☐	☐	☐
…provide an attractive market space.	☐	☐	☐	☐	☐
…provide customers with added services/experiences (e.g. cooking demonstrations, free samples, and information).	☐	☐	☐	☐	☐

13) To what extent do you agree or disagree with the following statement?

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
I help provide a leisure experience at the farmers' market	☐	☐	☐	☐	☐

14) We all have our own ideas about what leisure is. Thinking about a farmers' market, please indicate how strongly you agree or disagree with the following statement.

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
Farmers' markets provide a leisure experience.	☐	☐	☐	☐	☐

15) Managing the farmers' market is…

☐	…my full-time occupation.
☐	…a part-time occupation.
☐	…volunteer work.

16) To what extent do you agree or disagree with the following statements?

People go to farmers markets to…	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
…relax physically.	☐	☐	☐	☐	☐
…feel free to choose what they want to do or buy.	☐	☐	☐	☐	☐
…tell others about the market.	☐	☐	☐	☐	☐
…have others think highly of them for going.	☐	☐	☐	☐	☐
…do something with their family.	☐	☐	☐	☐	☐
…have a pleasurable experience.	☐	☐	☐	☐	☐
…be with people who have similar values.	☐	☐	☐	☐	☐
…meet other people.	☐	☐	☐	☐	☐
…get away from the usual demands of life.	☐	☐	☐	☐	☐
…learn about things while there.	☐	☐	☐	☐	☐
…obtain fresh produce.	☐	☐	☐	☐	☐
…access locally produced food.	☐	☐	☐	☐	☐
…support local agriculture.	☐	☐	☐	☐	☐
…just buy groceries.	☐	☐	☐	☐	☐
…support their local economy.	☐	☐	☐	☐	☐
…to get what they need.	☐	☐	☐	☐	☐
Other (please specify):	☐	☐	☐	☐	☐

17) How many vendors does the farmers' market you manage host? _____

18) How many years have you been a farmers' market manager? _____

19) How long has your farmers' market been in operation? _____

20) What is your five digit zip code for your farming location? _____

21) What year were you born? _____

24) What is your gender? _____

22) What is the highest level of formal education you have completed?

- ☐ Less than 12 years
- ☐ High school graduate/GED
- ☐ Some college
- ☐ College degree
- ☐ Advanced degree

Thank You for completing the survey.
Your time and input is greatly appreciated!

Please return the survey in the envelope provided to:

Farmers' Market Study
Attn: Crystal Miller
480 Wilson Road, Room 131
East Lansing, MI 48824-1222

Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Strengthening the core business of farmers markets through strategic business planning

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Submitted August 30, 2013 / Revised February 23, March 1, March 3, April 18, and June 2, 2014 / Accepted June 2, 2014 / Published online September 18, 2014

Citation: Connell, D. J., & Hergesheimer, C. (2014). Strengthening the core business of farmers markets through strategic business planning. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 97–108. http://dx.doi.org/10.5304/jafscd.2014.044.017

Abstract

The current period of growth in the number of farmers markets is associated with higher demand for local food but also leads to more competition among farmers markets. Dealing with increased competition challenges the way that farmers markets are used to operating. In this commentary, the authors discuss how a business-oriented approach to strategic planning may help farmers markets respond to industry-wide changes. We first focus on what we refer to as the core business of a farmers market, whereby a farmers market can view itself as a business entity that functions separately from its vendors. We extend this discussion to strategic business planning and how competitive analysis can be used to better understand and thereby strengthen a farmers market's position in an increasingly competitive marketplace. Ideally, a business-oriented perspective should not compromise the special qualities of a farmers market but serve to enhance these qualities and add to the growth and development of a farmers market. The insights in this commentary are drawn from the general experiences of the authors.

Keywords

farmers markets, strategic business planning, industry growth, competitive analysis

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Note: Portions of this commentary were published as a guidebook, *Selling at BC's Farmers' Markets: A Guide for New Farmer Vendors*, for the British Columbia Association of Farmers' Markets.

Introduction

The number of farmers markets across North America has grown substantially over the past ten years. This growth, which is associated with wider acceptance, more customers, and increased product standardization, is viewed usually in positive terms for both farmers and people looking to buy locally produced seasonal foods. However, the increase in the number of farmers markets is also a catalyst for increased competition among farmers markets. This competition derives from existing markets expanding, new markets opening up, and the promoting of "local foods" by supermarkets and other food retailers. Thus, while the growth in farmers markets indicates a stronger local food movement it also challenges many of the current ways that farmers markets operate.

Corum, Rosenzweig, and Gibson (2001) were among the first to recognize the need for farmers markets to respond to the challenges of increased competition. They described a potential situation in which the weakest markets will be sifted out as the level of competition increases. To avoid this kind of situation, Colihan and Chorney (2004) state that farmers markets must learn to "work smarter." In this commentary, we present our view of how farmers markets can "work smarter" by adopting a more business-oriented approach to strategic planning.

To adapt to increased competition, and capture benefits of industry growth, businesses typically invest in planning. The function of planning in a general sense is to make a desirable future a visible part of today's decision-making processes (Connell, 2009). The primary aim is to gain a better understanding of where a business wants to be in the future and how to get there. But thinking like a business is not common among the management teams (board members and market managers) of farmers markets. Therefore, one aim of this commentary is to introduce business terms and concepts that can help members of management teams to consider their farmers market as a business entity with its own goals.

We believe that a business-oriented approach does not displace the foundational spirit of a farmers market as an arena for community development. Rather, we believe that thinking of a farmers market as a business can enhance its non-economic qualities by helping to focus on its strengths. In other words, we are not advocating a business approach at the expense of the unique qualities that make farmers markets special. In the face of increased competition, farmers markets must find creative ways to think about what they do best in order to strengthen these qualities rather than lose out to businesses disguised as farmers markets. Within the context of strategic planning, we will discuss what we see as the core business of farmers markets. We then discuss how competitive analysis can be used to better understand and thereby strengthen a farmers market's position in an increasingly competitive marketplace.

Strategic Business Planning

A typical outcome of strategic planning by a business facing the challenges of industry growth is a focused marketing strategy that differentiates its offerings from other competitors. This approach seems reasonable for farmers markets as well. Doing so, however, requires farmers markets to shift from organizational planning to strategic planning.

Like most non-profit organizations, farmers markets focus on their vision, mission, objectives, goals, and action plans. That is, they focus on organizational planning. The resources available that support organizational planning among farmers markets are extensive, with a broad range of topics and analytical tools (e.g., Brushett, 2008; de Beaufort & Wagner, 2009; Govindasamy, Zurbriggen, Italia, Adelaja, Nitzsche, & VanVranken, 1998; Jolly, 2005; Ostrom & Lyons, 2007; Schmit & Gómez, 2011; Sneed & Fairhurst, 2010; Stegelin, 1997; Wallace Center (2007a, 2007b). The strength of these resources rests upon their ability to encourage management teams to think critically about a desirable future for their farmers markets.

The kind of organizational planning that focuses on mission statements and action plans, while very effective in starting a farmers market, is too broad to deal with the specific challenges of industry growth and increased competition. Quite often, members may all agree on the broad mission of the farmers market but disagree as to how to get

there, which can lead to conflict. Strategic planning includes the same elements as organizational planning but also has an explicit focus on the structure and dynamics of the external environment. In a business context, this means focusing on the current position of a business in the marketplace and where it wants to be. This kind of planning requires one to look at how a business functions as part of a whole vis-à-vis its competitors, as well as regulators and other external dynamics. Strategic business planning, therefore, has two defining components: an orientation to the future and an external focus on the competition. For farmers markets that have done organizational planning, a complement of business-oriented strategic planning adds a level of analysis that can help generate new insights.

As part of any planning process, it is essential that everyone involved has a common starting point; that is, everyone needs to be "on the same page." A likely consequence of not having a common perspective is that the process can lose its focus and devolve into what seem like endless arguments because the group lacks a common framework for reconciling differences. The alternative is to invest time and effort up front in order to ensure that the foundational purpose of the market is clearly understood by everyone involved. However, one of the primary obstacles to strategic business planning that we have found among farmers markets is that they don't have the words and concepts to be able to think about their farmers market *as a business*. Without a shared understanding of the core business of a farmers market it is not possible to engage in a productive strategic business planning process.

The Core Business of Farmers Markets

It is common to associate farmers markets with a broad range of goals, interests, and functions, such as selling local foods, supporting the local economy, and serving the community. For example, Colihan and Chorney (2004) open their book by quoting Agriculture and Agri-food Canada (AAFC): "Farmers' markets are about more than the sale of agricultural commodities. They are about community, food, friends, and sense of sharing" (AAFC, 2002, p. 13, cited in Colihan & Chorney, 2004, p. 15). Likewise, Corum et al. (2001) suggest possible multiple "primary goals" of a farmers market, e.g., to build community, to help local farmers, provide food retail services to inner city residents, and preserve farmland. While these possible goals, interests, and functions accurately speak to characteristics of farmers markets, we question whether any of them define the core business of a farmers market. As Brushett (2008, slide 18, emphasis added) asks of farmers markets, "What business are you *really* in?"

Among the definitions of farmers markets presented by associations and government agencies one common element stands out: the integral role of direct sales from producer to consumer. The fresh and local qualities of products are also emphasized among the definitions, as is the physical element, which can be a place, space, building, common area, common facilities, centralized location, etc. From these ideas it appears that the core business of a farmers market is about direct sales of local fresh food on a recurring basis in a physical location.

While general definitions help to describe farmers markets, they do not address their function. For example, Corum et al. (2001) identify two major functions of farmers markets: to support local farmers and provide customers with produce. These two functions, they point out, "can erupt as conflicting goals, leading to a philosophical and practical split within the ranks of farmers, managers, and boards" (p. 132). They then conclude that "neither school will necessarily win the debate" (p. 133). But perhaps it is not for either school to necessarily win. As Lohr, Diamond, Dicken, and Marquardt (2011) state, "The viability of individual markets depends on attracting sufficient numbers of vendors and customers. Farmers markets must attract enough vendors to offer the quantity and variety of products needed to retain customer interest. At the same time, the markets must also attract enough customers to maintain vendor interest and participation" (p. 1). These accounts of farmers markets more clearly specify that the function of a farmers market is about bringing farmers and shoppers together such that the needs of both are met. This function suggests that the core business of farmers markets reflects a three-part rela-

tionship: a farmers market serves to match farmers who want to sell directly to customers with shoppers who want to buy food directly from farmers. As part of this three-way relationship, farmers must sell enough products at the right price and customers must be able to buy what they want at the right price. This is what we refer to as the farmer-market-shopper match. In this sense, both the vendors and the shoppers are "customers" of a farmers market. As King (2006, n.p.) states succinctly, "You need both vendors and customers to make a market work. Make sure you don't neglect one for the other."

The idea of a farmers market serving to match farmers with shoppers leads to a more concise definition of the core business of a farmers market, as follows: *The core business of a farmers market is to profit by bringing vendors and market shoppers together in a unique setting.* In this definition we use the term "profit" to emphasize that a market has an explicit intent to benefit from its match-making service. The term "profit" also emphasizes that a farmers market can be viewed as a business entity. We also add "in a unique setting" to the statement to infer a particular quality of farmers markets as a special place of interaction, which focuses attention on the unique qualities of the setting.

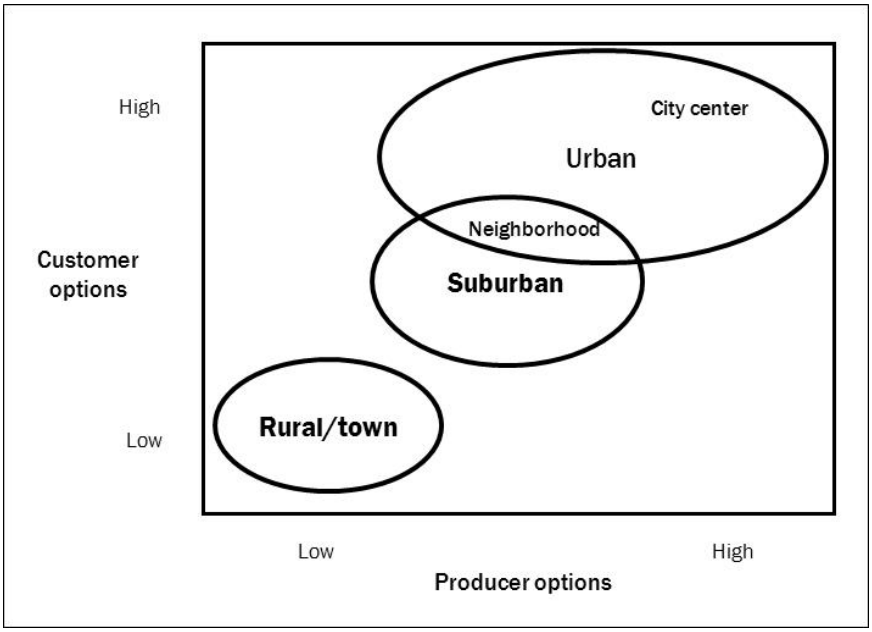
A shared understanding of the core business of farmers markets provides the foundation for strategic business planning. It provides a common language that helps people to think and talk about farmers markets in business terms. This shared understanding of the business of a farmers market also provides a common point of reference, a place from which members of the management team can look both inward and outward. Internally, a market can examine how a business perspective can enhance its triple bottom line that includes social and environmental goals and objectives. Externally, from this common perspective it is much easier to discuss and agree upon what makes farmers markets different from each other, what industry they participate in, and who their competitors are.

A Typology of Farmers Markets

While farmers markets may look and feel the same, many external factors influence the kind of match that a farmers market can provide. The customer base involves factors such as income, shopping patterns, and preferences. Likewise, there is diversity among farmers, including products, production methods, size, and marketing channels used. Other factors include the size of the farmers market (very small to very large) and the presence of tourists. More tourists may translate into more visitors but not necessarily more shoppers. More tourists may also mean more artisan sales than craft sales, which increases the average amount spent by market shoppers, but not necessarily on farm products. As such there are many factors that influence how a particular market appeals to both producers and consumers, thus affecting how the farmers market serves as a particular match.

It is possible to analyze how external factors influence the core business of a farmers market by

Figure 1. Typology of Farmers Markets



examining a combination of two overriding factors: (1) the options available to producers to sell via direct marketing channels; and (2) the options available to consumers to purchase directly from farmers. These two factors play out differently in different locations. The potential combinations of producer and consumer options suggest a typology of farmers markets, as illustrated in Figure 1 and described in Table 1. Urban areas include both inner city and city neighborhoods. City neighborhoods and some suburban areas may overlap. Town markets are found in rural and isolated areas, and include small cities.

Although this typology of markets might seem simple, it also provides several insights. First, the combination of options defines types of farmers markets rather than the market's location, per se. For example, a significant insight that emerges

Table 1. Characteristics of Farmers Markets by Type

Urban	Suburban	Rural/Town
Description: Located in high population centers. Includes all markets in Vancouver and Victoria and small cities such as Kelowna, Kamloops and Prince George. May also include markets in larger suburbs in the southwest region.	**Description:** Located within a short drive of urban centers. Includes many areas in the Lower Mainland as well as around Victoria; also present around smaller cities. Suburban locations have a variable range of producer and consumer options.	**Description:** Located in small towns or isolated areas with few or no other markets nearby. Rural areas such as the Central Interior, most of Northern BC, areas of the Kootenays, the North Coast, and the Rockies operate town markets. Town markets make up almost half of the markets in the province. Town markets provide the smallest range of options to both producers and consumers.
Consumer options: Have access to a variety of other direct marketing channels (CSA, food box delivery, U-pick) that offer convenient, alternative outlets to purchase local food direct from farmers. Also have access to many retail establishments.	**Customer options:** Often compete with CSAs, farm stands, and U-pick operations which tend to be located in suburban areas. Specialty and retail outlets offering local food are not as prevalent as in urban centers.	**Consumer options:** While many town markets have a committed customer base, town markets provide one of the only access points for farm products that meet consumer ideals. Although the profile of alternative direct marketing options is rising, town markets tend to be the primary point of contact between consumers and local agricultural products.
Producer options: Farmers have access to a broad spectrum of customers and marketing options, ranging from restaurants to specialty retail establishments and institutions.	**Producer options:** Being located closer to areas of production, producers at suburban markets often use the market as a promotional tool to attract business to local farm stands. However, the prevalence of suburban "farm markets" that stock out of season and offer cheap products offers a distinct challenge to producers in terms of pricing and convenience.	**Producer options:** For vendors, town markets often serve as the only available marketing channel for small-scale production. Market power is restricted by the lack of economically viable marketing options.
Challenges: Allocation of spaces in urban markets tends to be limited and controlled. Access requires advance planning and dedication. Stall fees tend to be higher. Consistent production and attendance, innovation, and price and product presentation are very important to attract and retain customers.	**Challenges:** Suburban markets are often located within range of other markets and many operate on the same day and during the same hours, distributing the customer base to a number of sites.	**Challenges:** Markets face challenges with building and maintaining a consistent base of primary producers with a wide range of product offerings. Consistency and quality of products are central to market growth and stability.

from this typology relates to levels of competition among farmers markets. Generally, a high number of options for buying local food for both producers and consumers is associated with higher levels of competition, and this combination of options tends to occur in urban centers. This insight is consistent with what Lohr et al. (2011) found in their analysis of competition zones for vendors and customers, which deals explicitly with the consequences of overlapping markets as the number of farmers markets grows. They found that the level of competition for vendors is most intense in urban areas because farmers markets must compete with each other directly for both vendors and shoppers. Lohr et al. conclude that location is the "most accurate indicator of high-intensity competition" (p. 4), as also captured in the three-part typology of farmers markets.

The sets of options available to both producers and consumers effectively define key elements of a farmers market's external environment. The typology highlights how different sets of options lead to different outcomes, which create opportunities for a farmers market to strategically choose how it formulates its own match. To take strategic business planning to a greater level of detail a management team needs to examine its farmers market in relation to the industry within which it competes, identify who their competitors are, analyze what their market position is, and explore how they can strengthen themselves vis-à-vis their competitors. In the business world, this part of strategic planning is called competitive analysis.

Competitive Analysis

The aim of completing a competitive analysis is to analyze an industry as a whole to understand its potential evolution, its competitors, and a firm's own position in the industry (Porter, 1980, 1985). The objective is to understand what factors influence relations among competitors.

While some concepts and analytical tools related to competitive analysis appear in the broader literature on the agricultural sector, these studies tend to be technical studies of specific industries or commodities with limited transferability to farmers markets. There are some exceptions which are related directly to farmers markets. Sneed and Fairhurst (2010) use activity system mapping as a basic level of competitive analysis for farmers markets. Lohr et al. (2011) focus on mapping competition zones for vendors and customers, which deals explicitly with the consequences of overlapping markets as the number of farmers markets grows. With specific regard for competitive strategy, Lohr et al. point out the need for differentiation from competitors as a basis for market survival. They mention such strategies as operating on different days from nearby markets, extending the operating season, and building upon location-specific features (e.g., nearby businesses, parks, access to parking). Another exception is Lass, Lavoie, and Fetter (2005), whose study of Community Supported Agriculture (CSA) is directly relevant to farmers markets. They conclude that CSA operations have the ability to turn customer loyalty and ideological relations with customers into profits. However, as the authors discovered, few CSA operations actually use this market power to generate greater profits, which keeps prices lower for their customers. Given the close relationship between CSAs and farmers markets, it is reasonable to assume that these results can also apply to farmers markets.

Competitive analysis centers on relations among individual participants in an industry, which is referred to as market position. One way to analyze market position is to complete what is called a strategic group analysis, which is a tool that can be used to help visualize market positions of competitors. This analytical tool is used to identify who a business's direct competitors are and on what basis they compete (Porter, 1980). The aim is to focus on the business models of the major players in the industry. A business model refers to the underlying rationale of how a business is organized, how it operates, and the strategies it uses to maintain value.

Completing a strategic group analysis requires three steps. The first step is to specify the industry. The second step is to identify the businesses competing in the industry. The third step is to identify the most important factors or strategies that these businesses use to compete with each other.

The first step, to identify the industry in which farmers markets participate, is not as easy as it

Figure 2. Strategic Group Map: Food Retail

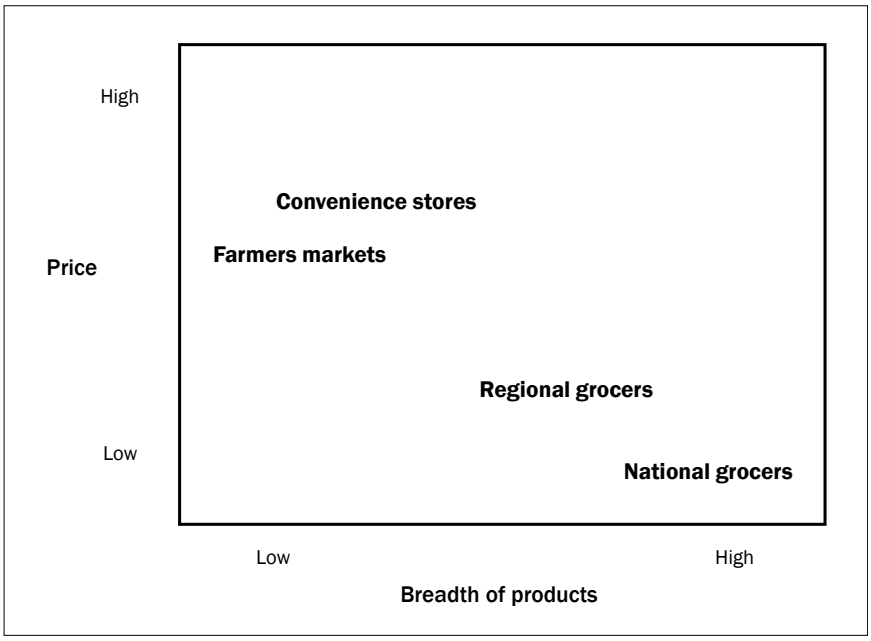
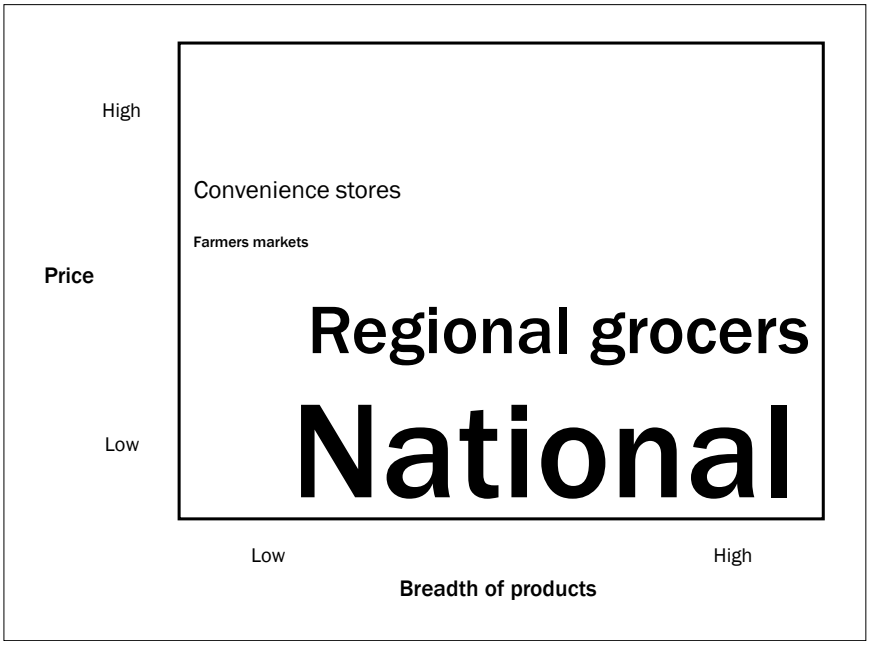


Figure 3. Strategic Group Map: Food Retail and Relative Size
The size of font is for illustrative purposes only; it is not based on real market share.



might appear because it is possible to analyze farmers markets as participants in different industries. For example, farmers markets can be analyzed as part of the "food retail" sector, which includes, for example, grocery stores of all sizes, health food stores, and convenience stores, as well as all forms of direct marketing (e.g., farmers markets, farm gate sales, CSAs, U-pick, internet sales). In simple terms, we can analyze the food retail sector based on two factors or strategic dimensions: price (which is closely linked with volume) and breadth of products and services. In Figure 2, the two dimensions of price and breadth of products help to visualize the relations among competitors in the food retail industry. National (and international) food retailers are clearly focused on low prices (and very high volumes), with regional food retailers doing their best to compete with them. Simultaneously, the largest retailers have far broader ranges of products and services compared to convenience stores and farmers markets. The smaller retailers will never be able to compete on these terms with the bigger retailers. The reality of the situation is better illustrated in Figure 3, which is a modest attempt to incorporate the relative size of each business into the analysis.

As the competitive analysis of the food retail industry shows, farmers markets cannot compete directly with big, national retailers. But farmers markets need not accept this situation. Every business has an opportunity, at least to some extent, to choose and shape the industry in which it wants to compete, and can choose to think of its industry in different terms. Thus, while there is

merit to considering different industries in which farmers markets are players, redefining the industry as a *farm-direct* food retail operation positions farmers markets within a niche segment of the food retail sector that is relatively small and specialized.

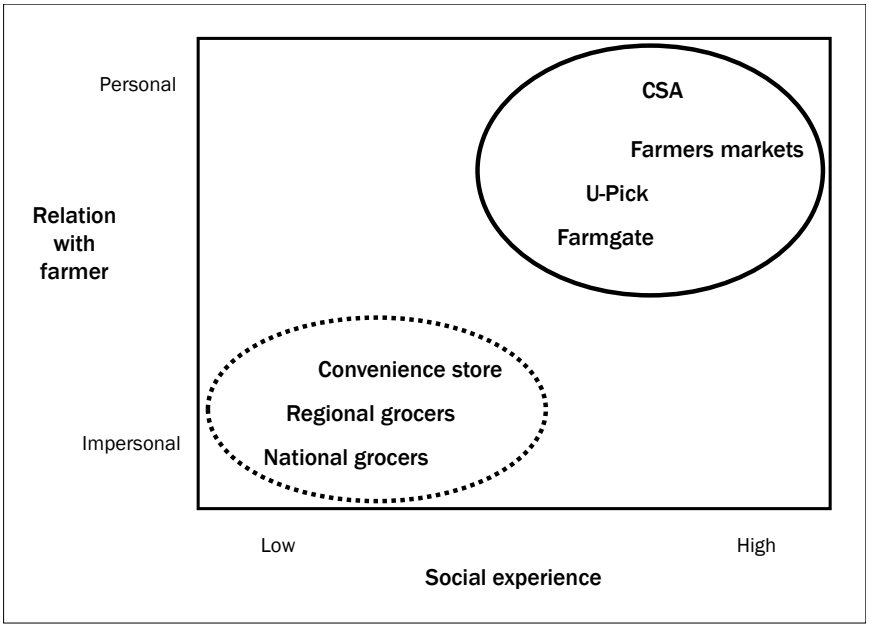
By changing the industry we also change the strategic dimensions that define who are the most direct competitors with farmers markets and on what basis they compete. For example, we can consider the following two factors: (1) the relationship with the farmer (personal to impersonal); (2) the social experience (low to high). Both factors account for the primary ways that farmers markets compete with each other and their competitors. In this way, re-defining the industry in which farmers markets participate effectively changes the competitive landscape, as shown in the strategic group analysis of the farm-direct food retail industry (Figure 4). In this niche industry segment, we can more clearly see that farmers markets form a strategic group with CSAs, farm gate sales, U-pick, and internet sales. Furthermore, we can also see important differences within this strategic group, with CSAs providing the most personal relation with farmers but not the same social experience. At the same time, these direct competitors may also be farmers market vendors, which presents some interesting dynamics. What is in the best interest of the farmer who sells at a farmers market but also has a CSA program may or may not be in the best interests of the farmers market.

As also shown in Figure 4, there is a group of indirect competitors, which includes grocery stores and other food retail outlets. Although the businesses among these indirect competitors can never replicate the special qualities of farm direct marketing, they certainly try, as evident by the increasing use of in-store profiles of local farmers and use of the "farmers market" brand.

Companies usually compete with each other based on price, quality, and innovation. When there are many players of about the same size with similar products, then rivalry can be intense. And when the prospect for attracting new customers is low, because of a lack of growth in the industry, for example, then companies can only gain customers by competing directly for the same pool of customers. The result of this intense competition is low returns, because the cost of competing, whether by price, advertising, or innovation, is high. Based on our experience, we have found that competition in the farm-direct food retail industry is focused less on price and more on features such as quality of the food product, consistency, and reliability of vendors, as well as sociability of the venue. These factors tend to reduce the level of rivalry among farmers markets. Still, rivalry can come to the surface when the trade area of different markets overlap; that is, when two or more markets draw from the same population for its shoppers. This increased level of rivalry is evident in the study of competition zones by Lohr et al. (2011). Rivalry can be more heated when it comes to recruiting new vendors when the latter are in short supply.

Our analysis of the relations among farmers

Figure 4. Strategic Group Map: Farm-Direct Food Retail
The solid line shows a strategic group. The dotted line shows indirect competitors.



markets and their competitors reveal that customer loyalty and rivalry/collaboration among existing vendors are two important characteristics that define competitive relations. Customer loyalty is related to both the power of buyers and threat of new entrants. Generally, farmers market shoppers tend to have a high level of influence over prices because often they can easily switch to another farmers market or marketing channel. As a counter to this high level of market power among shoppers we found that customer loyalty provided farmers markets with an advantage. This is consistent with the factors that Lass et al. (2005) found: higher customer loyalty improved a CSA's ability to capture more profits. "[T]he nature of their products, i.e., fresh organic vegetables produced from a known source, is such that consumer loyalty and 'brand' recognition make consumers captive to a given farm" (p. 5). Likewise, Youngs' (2003) investigation of farmers markets in northwest England found that customer loyalty was an important part of their success.

The level of rivalry/collaboration among vendors is directly related to the intensity of competition among existing vendors. When vendors are more willing to collaborate for the benefit of the market as a whole, they are also less likely to compete with each other over prices. When considered in the context of the three types of farmers markets we discussed as part of our typology (Figure 1), and as Lohr et al. (2011) found, rivalry is highest among urban markets, primarily because the markets are closer together and shopper traffic is typically higher. As Govindasamy et al. (1998) note, although rivalry among vendors and between vendors and local retailers is not serious in general, rivalry among farmers is a serious problem in some cases. Stegelin (1997) also notes that the level of co-operation among producers in an area should be considered as part of a market feasibility study.

Looking Ahead and Moving Forward

If the farm-direct food retail industry follows a typical industry life cycle, there will be a shakeout as the industry moves through its present stage of growth. This shakeout could mean that more difficult decisions are ahead for farmers markets as they respond to challenges of increasing competition, recruiting new farmer vendors, and satisfying increasing demands for an "authentic" shopping experience. Under these circumstances, analytical tools that are designed to help businesses respond to these changes can also support a farmers market's strategic planning process by helping to make sense of the farm-direct food retail industry as a whole and of how to put a farmers market in the best position to be successful.

Herein are some important benefits of a business-oriented approach to strategic planning. Focusing on the core business of a farmers market helps to answer the question, "What is it that we *really* want to do?" This helps management teams deal with the practical functioning of the farmers market and provides language that members can use to engage in detailed discussions about how to strengthen their farmers market. Focusing next on market position provides a visual tool to help facilitate a discussion about the farmers market's current position. This is a good point in the planning process to discuss the farmers market's strengths and weaknesses as well as opportunities and threats (i.e., SWOT analysis) that define their core business and improve their position in the marketplace. By defining the context and identifying direct competitors, a competitive analysis helps to distinguish more clearly between factors internal to the farmers market (strengths and weaknesses) and factors external to the farmers market (threats and opportunities).

This work leads to the next critical question in the strategic planning process: "Now that we understand our position in the marketplace, where do we want to be in five years?" Herein lies the value of a strategic group analysis. If a management team has done the work to capture their farmers market's position vis-à-vis its competitors in a chart like Figure 4, then it is much easier to ask where, in five years' time, does the market want to be. In other words, does a farmers market want to position itself up or down or left or right on the two axes? How important is it for the market to promote personal relations between its customers and its vendors? What can the market do to maintain or improve the experience of shopping at the market? These are the kinds of questions that

management teams should ask themselves as part of a strategic business planning process. The answers to these questions can be wide-ranging, resulting in anything from significant shifts to subtle changes in how a farmers market operates.

One of the most effective ways to translate insights gained from a strategic business planning process into decisions is to consider changes to policies. For some farmers markets, policies are viewed only as a set of rules and regulations for managing vendors. However, when considered in conjunction with an analysis of market position in the farm-direct food retail industry, policies change from tools of control to tools for turning a farmers market's competitive strategy into a competitive advantage.

Several policies stand out as particularly important for strengthening market position. These include staffing of vendor tables, cooperative selling arrangements, vendor mix, and re-selling produce. For example, if a farmers market has re-selling policies that permit someone other than the farmer to sell the farm's products, then this reduces the level of direct interaction between farmer and customer, thus changing the relation with the farmer and moving the market down the vertical axis. The quality of social experience is influenced less directly by policies, but policies that affect the look and feel of a market, such as a policy (or lack thereof) to limit the proportion of non-food vendors, can alter the quality of the shopping experience. Each one of these policies may hinder or help a farmers market's ability to compete in the farm-direct food retail industry.

As we have tried to demonstrate through this discussion, there are valuable opportunities in implementing a business-oriented approach to strategic planning. Based on our experiences working with farmers market management teams, we have found that using business concepts as a basis for strategic planning helped to change the way they understood their farmers market operations As one person told us, "Even after thirty years, I was able to see the market from a new perspective." Another person stated, "It opened them [members of the management team] up to a project over the winter in which we took a much deeper look at the market as a business. They are slowly prioritizing areas of business development initiatives and developing projects to enhance the market as a business entity." While a business-oriented approach to strategic planning can benefit any farmers market, it may be most effective for markets facing the highest levels of competition, which are often located in urban areas.

However, while there are benefits to strategic business planning there are also significant challenges. As mentioned above, some members of farmers markets have not thought about their market in business terms before and may find the planning process difficult. In addition, people have expressed concern about viewing the markets strictly in business terms. Central to the concerns expressed by market management teams with whom we have worked was the potential to compromise the key character of the farmers market, as reflected in the following statement by one member of a management team:

> The beauty of Farmers' Markets is their simplicity and purity. The ritual baskets of fresh produce are timeless, and is the foundation of the market. The market must remain, foremost, as a simple connection between the community and their food. If this connection becomes overly riddled in technology, it will lose the key to its foundation.

An additional concern relates to the difficulty of changing one's perspective. As one person stated, "Change can sometimes be slow and painful." The difficulty stems from a combination of introducing new ideas that are "outside of the comfort realm" of board members and of having board members who are not open to these new ideas. Consequently, "It will either take time to make the adjustment with the present group, or they will have to add some new talent with expertise in business to the Board to help with the transition." A related challenge, the significance of which cannot be overstated, concerns the regular turnover among volunteer board members and the possible need to orient new members repeatedly to a business approach. Consequently, the knowledge and experience gained from going through a

thorough planning process can be lost quickly because of turnover within the management team. One way to mitigate this potential loss is to ensure that detailed notes are recorded throughout the planning process. Finally, all of the possible challenges facing farmers market management are exacerbated when the work is done by only a small number of people. This has the potential to limit the generation of new ideas and can lead to biased decisions.

Ideally, a business-oriented perspective should not compromise the special qualities of a farmers market but serve to enhance these qualities. At the same time, we believe that a business-oriented approach to strategic planning must not be rejected without serious consideration of the potential contributions such a perspective can add to the growth and development of a farmers market, especially during a challenging period of industry growth. 

Acknowledgements

The authors thank the British Columbia Association of Farmers' Markets for their support of this research and the members of the farmers markets who shared their experiences and insights with us.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Consumer and producer information-sharing preferences at Arizona farmers markets

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Submitted January 6, 2014 / Revised March 13 and May 23, 2014 / Accepted May 27, 2014 / Published online September 16, 2014

Citation: Fehrenbach, K. S., & Wharton, C. M. (2014). Consumer and producer information-sharing preferences at Arizona farmers markets. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 109–127. http://dx.doi.org/10.5304/jafscd.2014.044.014

Abstract

Venues allowing consumers to purchase foods directly from producers, such as farmers markets, have grown rapidly in recent years. Direct-to-consumer marketing not only allows consumers to buy locally produced foods; it also facilitates interaction with producers through which consumers can learn more information about the foods they buy. Although information exchange is important in consumer purchasing decisions, little research has been conducted on information consumers and producers would like to share at farmers markets. This mixed-methods survey study (i.e., including quantitative and qualitative methods) explored interests of both consumers and producers regarding the types of information they would like to learn or share at farmers markets, as well as preferred methods by which they would like this information communicated. Quantitative results showed that consumers and producers were most interested in sharing information regarding pesticide use, flavor, freshness, food safety, animal welfare, nutrition, and environmental impacts; qualitative results indicated consumers were strongly interested in local sourcing, organic production, and animal care. Both groups were interested in sharing information via consumer-initiated conversations. Consumers noted purchasing needs and vendor relationships as drivers for choosing which producers to buy from. These findings could facilitate consumer-producer interactions at farmers markets as well as informed purchasing decisions by consumers.

Keywords

communication, consumers, farmers markets, health, local food, nutrition, producers, sustainability

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Introduction

Farmers markets represent an important intersection of rural and urban communities, where consumers can directly interact with producers to make informed food-purchasing decisions, often including consideration of specific forms of information, such as the sustainability, ethics, or locality of food production, nutrition, food safety, freshness, and novelty of available goods. The purpose of this study was to better understand how information-sharing between consumers and producers could be optimized at farmers markets. Increasing food-related information transparency has the potential to increase consumer patronage and vendor sales. Utilizing both quantitative and qualitative methods, the study explored interests of both consumers and producers regarding the types of information they would like to learn or share at farmers markets, as well as preferred methods by which they would like this information communicated.

Literature Review

Direct-to-consumer marketing of locally and regionally produced foods has been a rapidly growing trend in the United States over the past several decades. Data from the most recent U.S. Census of Agriculture, for example, showed that direct-to-consumer sales accounted for $1.2 billion of total agricultural sales in 2007, a 77 percent increase since 1992 (Low & Vogel, 2011). To meet this growing demand, the number of farmers markets, community supported agriculture programs, and other local foods venues are all increasing in number each year (MacMillan, Uribe, Winham, & Wharton, 2012; McCormack, Laska, Larson, & Story, 2010). Farmers markets make up the largest proportion of direct-to-consumer marketing venues and have seen considerable growth both in rural and urban areas. In the early 1990s, fewer than 2,000 markets existed in the U.S; by 2014, however, 8,268 markets had been established (Low & Vogel, 2011; U.S. Department of Agriculture [USDA] Agriculture Marketing Service, 2014). Further, farmers markets are now seen as important venues for healthy food access and improving the food environments in which consumers make food choices (Holben, 2010; McCormack et al., 2010; USDA and U.S. Department of Health and Human Services, 2011).

Across several regions, consumers have identified freshness (Andreatta & Wickliffe, 2002; Eastwood, Brooker, & Gray, 1999; Hunt, 2006), quality, (Eastwood et al., 1999; Hunt, 2006; Walton, Kirby, Henneberry, & Agustini, 2002; Wolf, Spittler, & James, 2005), selection, (Eastwood et al., 1999; Hunt, 2006; Onianwa, Mojica, & Wheelock, 2006), and price (Eastwood et al., 1999; Onianwa et al., 2006; Wolf et al., 2005) as attributes that influence farmers market patronage. In addition, multiple values-based motivators likely contribute to consumers' interest in purchasing foods at farmers markets. Along with access to nutritious foods, a number of studies have identified local or organic production as key values among consumers who shop at farmers markets (Andreatta & Wickliffe, 2002; Baker, Hamshaw, & Kolodinsky, 2009; Byker, Shanks, Misyak, & Serrano, 2012; Dukeshire, Garbes, Kennedy, Boudreau, & Osborne, 2011; Eastwood et al., 1999; Kremen, Greene, & Hanson, 2004; Wolf et al., 2005). Similarly, perceived sustainability of growing, harvesting, and other production practices are important aspects of consumers' motivation for buying local foods (Byker et al., 2012; Dukeshire et al., 2011). Finally, consumers frequently note support for small-scale, local agriculture and perceive community connectedness as strong motivators for purchasing food at farmers markets (Eastwood et al., 1999; Hinrichs, 2000; Hunt, 2006; Onianwa et al., 2006; Walton et al., 2002; Zepeda & Li, 2006). For a more detailed review of the literature on farmers market consumers, please see Fehrenbach and Wharton (2012).

A number of the motivators identified above also relate to consumer food choice in conventional venues, especially in relation to fruit and vegetable purchase. In particular, quality and taste attributes remain some of the most important factors in choosing and consuming fruits and vegetables, regardless of venue (Pollard, Kirk, & Cade, 2002). Among consumers purchasing organic fruits and vegetables at any venue, quality is still a key attribute in decision-making. However, the presumed impact of such a choice on the environment, on personal health, and in relation to supporting the local economy are also of concern

to consumers (Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007).

Importantly, consumers can expect to find standardized food-related information at conventional retail venues due to government-regulated content, such as ingredient lists and nutrition information. Such standardization is absent from farmers markets. Additionally, consumers have indicated a desire for increased disclosure of unique food attributes (i.e., social, environmental, and ethical information) in traditional grocery outlets (Howard & Allen, 2006), as well as such transparency as a reason for attending farmers markets (see studies cited above). Neither standardized nutrition and ingredients nor disclosure of unique attributes are systematically transparent at farmers markets. Fulfilling consumer desire for food-related information at farmers markets has the potential to improve consumer patronage and vendor sales. Communicating values-based food information might also require different modes of communication than are currently used in conventional retail venues.

Despite a good understanding of the values that motivate consumers to attend farmers markets, very little research thus far has considered what information consumers seek and producers provide at farmers markets, and how information is sought and provided. Most studies to date have considered values and interests of consumers alone (Fehrenbach & Wharton, 2012; Gao, Swisher, & Zhao, 2012; Svenfelt & Carlsson-Kanyama, 2010) or vendors or market managers alone (Kremen et al., 2004; Lea, Worsley, & Crawford, 2005). To our knowledge, only two studies examined both consumers and producers at farmers markets in relation to each other (Hunt, 2006; Kirwan, 2006). Hunt (2006) focused on social interaction and did not include an assessment of the types of information, nor the modes of communication, of interest to both consumers and producers. However, Hunt noted that social interaction is a key element of farmers markets: consumers have reported producers' influence on their food purchasing, while producers have reported consumers' influence on their production practices. Kirwan (2006) evaluated shared perceptions of value in direct-to-consumer market interactions and found that social interaction was an important element of farmers markets for both producers and consumers. As such, this present study explored interests of both consumers and producers regarding desired information sharing and communication methods. The study also included a qualitative assessment of how consumers make decisions about what booths to shop at, as well as the attributes of greatest interest by specific food categories, including produce, eggs, dairy, meat, and prepared foods.

Methods

Procedure

We recruited consumers and producers who regularly attend or vend at farmers markets in three U.S. geographic areas (Phoenix, Tucson, and Prescott, Arizona) to complete an online survey. As an incentive to participate, we raffled two $100 farmers market gift certificates (one for consumers and one for producers). In all three geographic areas, we recruited farmers market consumers and producers using online sampling procedures. We also recruited participants in-person at farmers markets in greater Phoenix. Participants learned about the survey through farmers markets' websites and Facebook pages, e-newsletter announcements, and/or on-site at participating markets. In addition, we emailed invitations to each producer listed on market websites (excluding those who sold prepared foods) for whom we could locate an email address. In the Phoenix area only, we set up tables at farmers markets for consumers to stop by and either fill out a survey or provide their email address to be sent the survey link. For producers, we stopped at the booths to offer a personal invitation to participate.

The survey took approximately five to 10 minutes to complete. The survey began with an informed consent page, followed by measures of preferred information content, preferred communication methods, and demographic questions. The raffle entry page was not tied to survey responses.

Consumer Sample

Consumer participants in this study (N=257) comprised frequent attendees of one of 14 farmers markets in metro-Phoenix, Arizona (n=207), one

of five markets in Tucson, Arizona (*n*=39), or one of three markets in Prescott, Arizona (*n*=10). Consistent with the Arizona Farmers market Nutrition Program guidelines (Arizona Department of Health Services, 2013), all farmers markets included in the study had at least two fruit and vegetable producers. All consumers regularly attended and made purchases at their local farmers market: 50 percent of participants (*n*=125) made purchases 1 to 2 times per month and 50 percent (*n*=126) made purchases 1 to 2 times per week. Consumers who made purchases less than once a month were excluded from all analyses. Most of the consumers in the sample (75 percent, *n*=132) were recruited in-person; a quarter of the consumers (25 percent, *n*=45) were recruited via online methods. See Table 1 for consumer demographic characteristics.

Producer Sample

Producer participants in this study (*N*=48) were those who sold raw food products (e.g., fruits, vegetables, or animal food products) at Arizona farmers markets in the areas of Phoenix (69 percent, *n*=33, representing 11 markets), Tucson (17 percent, *n*=8, representing 4 markets), and Prescott (15 percent, *n*=7, representing 2 markets). All producers regularly vended at their local market: the majority (96 percent, *n*=44) sold products 1 to 2 times per week and two (4 percent) sold products 1 to 2 times per month. Farmers who vended less than once a month were excluded from all analyses. Vendors who exclusively sold prepared food were also excluded from analyses. Eighty-seven percent indicated they sold food from Arizona (*n*=27) and the remaining 13 percent stated that they sold food from other states: Alaska (*n*=2), California (*n*=1), and Rhode Island (*n*=1). Of the 28 producers who indicated that they sold produce, 18 percent (*n*=5) indicated that they used conventional production methods. The remainder indicated that they used other method(s), including USDA-certified organic (18 percent, *n*=5), noncertified organic (64 percent, *n*=18), certified naturally grown (14 percent, *n*=4), noncertified naturally grown (64 percent, *n*=18), pesticide-free (79 percent, *n*=22), low pesticide or chemical use (7 percent, *n*=2), biodynamic (14 percent, *n*=4), crop rotation (61 percent, *n*=17), conservation tillage (11 percent, *n*=3), or other (11 percent, *n*=3). Most of the producers in the sample (75 percent, *n*=24) were recruited in-person; a quarter of the producers (25 percent, *n*=8) were recruited via online methods. See Table 1 for producer demographic characteristics.

Table 1. Characteristics of the Consumer and Producer Samples

	Consumers (*n*=257)		Producers (*n*=48)	
Characteristic	%	*n*	%	*n*
Sex				
Female	75	184	51	21
Male	25	60	49	20
Age				
18–29	15	38	20	8
30–39	28	67	15	7
40–49	17	42	13	5
50–59	21	50	25	10
60 or older	18	44	25	10
Ethnicity				
Hispanic, Latino, or of Spanish origin	7	16	9	3
Race				
White/Caucasian	96	224	91	39
American Indian or Alaskan Native	2	5	0	0
Black/African American	1	3	2	1
Asian	1	2	5	2
Employment				
Employed	71	168	-	-
Unemployed	29	70	-	-
Education				
College Degree	74	181	71	30
No College Degree	26	113	29	12
Income				
Less than $25,000	17	38	24	8
$25,000–$49,999	19	42	24	8
$50,000–$74,999	23	50	24	8
$75,000 or more	41	92	27	9

Materials

For consumers, the survey began with open-ended questions. The first question was very broad and asked, "When you visited the farmers market this past year, how did you decide what booths to purchase foods from?" The next question was, "If you could find out anything about the food available at the farmers market, what would you like to know?" in relation to five categories of food: produce, meat, eggs, dairy, and prepared food.

Both consumers and producers responded to closed-ended questions. The first set of questions focused on preferred food-related information (i.e., for consumers, information they wanted to know; for producers, information they wanted to share). On 7-point single-item scales, consumers and producers indicated the degree of importance (1=*not important*, 7=*very important*) for each of 15 randomly sorted food-related topics. Topics focused on social, environmental, and economic aspects of the food system, including farm size, flavor, animal welfare, ownership of farm, farm location and distance from market, price of food, environmental impact of food production, farm worker wages or working conditions, pesticide use, nutrition, how to prepare/cook food, freshness, and water use. Next, the survey asked consumers and producers to identify their preferred methods of acquiring (in the case of consumers) or sharing (in the case of producers) information about food at the market. On 7-point single-item scales, participants indicated their degree of likelihood (1=*very unlikely*, 7=*very likely*) of adopting each specific communication method. The 11 randomly sorted communication methods included product labels, handouts, farmers market website, banners and signs, vendor-initiated conversations, consumer-initiated conversations, farm photos, market-wide coding system, handouts, Facebook, and Twitter.

The survey concluded with demographic questions and questions about the nature of participant shopping habits (for consumers) or vending habits (for producers), such as how they purchased or sold food at the farmers market and at which farmers market they most often purchased or vended. Producers were also asked what types of food they sold as well what methods they employed to produce foods they sold. Concluding demographic questions asked about sex, age, ethnicity, race, education level, employment status, and household income. See Appendix A and B for the full set of consumer and producer survey questions.

Data Analysis

Qualitative Analysis

Analysis of the open-ended data began by examining participants' responses for potential emergent codes. Unitizing the responses was not needed because the responses were fairly succinct. Two researchers independently examined the data to develop a list of potential codes and then worked together to create a codebook. The codebook provided a description of each code and identified several representative examples. The final codebook included 29 codes for the desired food-related information question, 39 codes (the original 29 plus 10 additional codes) for the food-purchasing decision question, and an "other" code that represented a meaningful but unique response.

Two additional researchers, who were each naïve to the participants' responses, independently assigned one or more codes to each response. The coder agreement rate for the purchasing decision question was 76 percent. The overall coder agreement rate across food categories for the desired food-related information question was 86 percent (produce: 90 percent; dairy: 89 percent; eggs: 89 percent; meat: 89 percent; prepared food: 76 percent). Nonsensical responses were excluded from all analyses. To obtain definitive codes for each response, all four researchers met to discuss discrepancies. The reported codes reflected consensus among the four researchers regarding emergent themes. Each response could be assigned multiple codes, so there were more assigned codes than participant responses.

Some codes represented subthemes that related to an overarching theme. For instance, the two codes, "vender reputation" and "vendor friendliness/knowledge" were conceptualized together as the theme Vendor Relationship. In these cases, we reported the percentage of assigned codes for each sub-theme as well as the overarching theme. Codes that were unique and not closely related to another code remained alone as a major

theme. To be considered a major theme, the proportion of codes within at least one of the food categories had to be greater than 10 percent. To be considered a minor theme, the proportion of codes within at least one of the food categories had to be greater than 2 percent. Due to these inclusion criteria, not all codes are reported as themes in the results.

To capture the relative importance of each theme within the five food categories (produce, dairy, eggs, meat, prepared foods), it was necessary to report percentages rather than frequencies. Reporting the code frequency within each category would have been a misleading comparison because each food category had a different number of participant responses. For instance, the theme, Organic Production, represented 24 percent of the total codes (89 out of 369) in the produce category and 10 percent of the total codes (25 out of 244) in the dairy category.

Quantitative Analysis

For both consumers and producers, we reported the mean ratings and standard deviations for each desired food-related information topic and each desired communication method. First, in order to define *topics* that consumers and producers found important, we set a cutoff of ≥6.00 for each rating (on the 7-point Likert-type scale, a score of 6.00 indicated that a topic was *important* and a score of 7.00 indicated that a topic was *very important*). In order to define *communication methods* that consumers and producers preferred to use, we also set a cutoff of ≥6.00 for each rating (on the 7-point Likert-type scale, a score of 6.00 indicated that a communication method was *likely to be used* and a score of 7.00 indicated that a communication method was *very likely to be used*).

All topics and communication methods that received ratings ≥6.00 from *both* consumers and producers were defined as mutually significant. We summed the producer and consumer scores that made the initial cutoff to produce a "Total" score (see Brescoll, Kersh, & Brownell, 2008, for similar methodology). Thus, the Total scores for mutually significant items were ≥12.00. For example, the mean rating for the desired food-related information, Pesticide Use, was 6.59 for consumers and 6.96 for consumers. The sum of these two means created the Total score of 13.55, which represented a topic that consumers found important to know about and producers found important to share. A Total score of ≥12.00 indicated a topic or communication method that might be feasible to foster in the farmers market setting. We also compared consumer and producer ratings using a one-way between-subjects Analysis of Variance (ANOVA) for each topic and communication method. We set the alpha level at .05.

Results

Qualitative Data

The number of participant responses varied both by question as well as by food category. The number of participant responses for the food-purchasing decisions question was 454. The number of participant responses regarding desired information about foods available at farmers markets ranged from 154 to 253. Data analyses revealed a number of relevant, emergent themes, which are organized

Table 2. Food Purchasing Decisions

Themes	Percentage of Assigned Codes
Product Qualities	**39%**
Product appearance	10%
Price	9%
Taste	8%
Product quality	5%
Freshness	4%
Booth appearance	3%
Vendor Relationship	**18%**
Vender reputation	11%
Vender friendliness and knowledge of product	7%
Purchasing Needs	18%
Organic Production	5%
Local Sourcing	4%
Wandering/Browsing	4%
Produce Availability/Scarcity at Time of Purchase	4%
Availability of Unique Offerings	3%

Note: A total of 250 responses were received for the food-purchasing decision question. A total of 476 codes were assigned to the responses.

by question and occasionally followed by example quotes (in italics).

Food-purchasing decisions. Major themes that emerged related to the question, "When you visited the farmers market this past year, how did you decide what booths to purchase foods from?" included the following: Product Qualities, Vendor Relationship, and Purchasing Needs. Product Qualities comprised a number of sub-themes, such as Product Appearance, Price, Taste, Product Quality, Freshness, and Booth Appearance. Respondents noted, for example, that purchase decisions were based on *those offering free samples of fresh produce* as well as *how the food looks and how it is presented*. Vendor Relationship included two sub-themes related to consumers' relationship with, or knowledge of, vendors at the market. Vendor Reputation as well as Vendor Friendliness and Knowledge of Product were of greatest importance. For example, one respondent only purchased from *businesses I had heard about before*, and others purchased from *friendly people*, *vendors I trust*, or from *farmers [who] are old friends*. Purchasing Needs represented a broad interest of consumers in purchasing foods that they needed for the week or staples for cooking meals. One consumer noted, *[I] usually [buy] based on what I need to make pre-planned meals*, while another stated, *we buy as much for our week's meals as possible*. Minor themes were also noted, including Organic Production, Local Sourcing, Wandering/Browsing, Produce Availability/Scarcity at Time of Purchase, and Availability of Unique Offerings. See Table 2 for percentages of assigned codes.

Desired food-related information. Major themes that emerged in response to the question, "If you could find out anything about the food available at the farmers market, what would you like to know?" included Animal Care, Local Sourcing, and Organic Production. Animal Care comprised several related subthemes: animal welfare, animal inputs in terms of feed, and animal inputs in terms of supplements and additives. Consumers were concerned here with issues such as animal living conditions, animal transportation, and slaughtering practices, as well as feeding practices (e.g., grass-fed) and the use of antibiotics or hormones during the life of the animal. Local Sourcing was important across food categories. Consumers wanted to receive information about, for example, where farms were located in the state, as well as foods' specific source or production site. Organic Production also emerged as a major theme for all food cate-

Table 3. Desired Food-Related Information

	Percentage of Assigned Codes				
Themes	**Produce**	**Dairy**	**Eggs**	**Meat**	**Prepared Food**
Animal Care	**N/A**	**33%**	**43%**	**46%**	**1%**
Animal Welfare	N/A	13%	19%	15%	0%
Feed	N/A	8%	16%	20%	0%
Supplements/Additives	N/A	12%	8%	11%	1%
Local Sourcing	29%	16%	14%	16%	7%
Organic Production	24%	10%	10%	9%	10%
Freshness	7%	2%	7%	2%	6%
Farming/Soil Inputs	12%	2%	1%	1%	3%
Producer Qualities	4%	2%	1%	1%	4%
Seasonality	3%	0%	0%	0%	0%
Usage Ideas	3%	0%	0%	1%	1%
Availability of Raw Milk Products	0%	5%	0%	0%	0%
Ingredient Disclosure	0%	0%	0%	0%	25%
Nutritional Information	1%	2%	2%	1%	7%
Ingredient Sourcing	N/A	N/A	N/A	N/A	7%
Preparation Methods	N/A	N/A	N/A	N/A	5%
Preparation Location	N/A	N/A	N/A	N/A	4%
Use of Preservatives or Additives	N/A	N/A	N/A	N/A	4%
Producer Qualities	4%	2%	1%	1%	4%

Note: A combined total of 931 responses were received across food categories for the desired food-related information question (produce: *n*=253; dairy: *n*=134; eggs: *n*=182; meat: *n*=179, and prepared food: *n*=183). A combined total of 1,961 codes were assigned to the 931 responses across categories (produce: *n*=369; dairy: *n*=244; eggs: *n*=288; meat: *n*=314, and prepared food: *n*=270).

gories. Though not a major theme, Freshness emerged as a minor theme across several food categories, including produce, eggs, and prepared food.

Several themes emerged that were specific to particular food categories. Farming/Soil Inputs was a major theme important in relation to produce; consumers were interested in knowing, for example, whether herbicides, pesticides, or fertilizers were used in producing the food. Minor themes in the produce category included: Farming/Soil Inputs, Freshness, Producer Qualities, Seasonality, and Usage Ideas. Ingredient Disclosure was a major theme important for prepared foods. In this case, respondents wanted to know what specific ingredients were included in a prepared food product. The prepared foods category also had several minor themes: Nutritional Information, Ingredient Sourcing, Preparation Methods, Preparation Location, Use of Preservatives or Additives, Producer Qualities (e.g., working conditions or farm size), Freshness, and Ingredient Sourcing (e.g., how and where sourced). Finally, Availability of Raw Milk Products was a minor theme in the dairy food category. See Table 3 for percentages of assigned codes for each food category.

Quantitative Data

Desired food-related information. Table 4 presents the means, standard deviations, sample sizes, and sum of consumer and producer ratings for desired food-related information. Pesticide Use, Flavor, Freshness, Food Safety, Animal Welfare, Nutrition and Environmental Impacts all received high scores (≥6.00) from both consumers and producers (see Total column, Table 4). Consumers, but not producers, rated Seasonality of Produce highly (≥6.00). Producers, but not consumers, rated Cooking/Preparation Methods highly (≥6.00).

We computed a one-way between-subjects ANOVA comparing consumer and producer rat-

Table 4. Mean Ratings of Desired Food-Related Information

	Consumers			Producers [a]			
Topic	*M*	*SD*	*n*	*M*	*SD*	*n*	Total [b]
Freshness	6.79	0.54	248	6.56	1.14	39	13.35**
Flavor	6.65	1.88	250	6.78	0.99	41	13.43**
Pesticide use [c]*	6.59	0.88	249	6.96	0.21	23	13.55**
Food safety	6.57	0.82	239	6.54	0.93	37	13.11**
Nutrition	6.34	1.04	247	6.35	1.25	40	12.69**
Seasonality of produce [c]	6.21	1.09	248	5.21	1.84	24	11.42
Animal welfare [d]	6.20	1.24	244	6.60	1.10	30	12.80**
Environmental impacts	6.11	1.14	244	6.32	1.13	41	12.43**
Price of food*	5.86	1.28	251	5.20	1.65	41	11.06
Farm ownership	5.76	1.49	249	5.90	1.47	39	11.66
Farm location	5.61	1.49	245	5.73	1.34	39	11.34
Water use	5.57	1.37	247	5.95	1.54	39	11.52
Farm wages/working conditions*	5.50	1.46	246	4.71	2.10	38	10.21
How to prepare/cook the food*	4.91	1.82	252	6.00	1.04	40	10.91
Farm size	4.47	1.88	247	4.95	1.62	39	9.42

[a] Vendors who exclusively sell prepared food were excluded from the analysis.

[b] Mean consumer and producer ratings were summed. Total could range from 2 to 14.

[c] Only producers who sell fruit and vegetables were used in the analysis.

[d] Only producers who sell animal products were used in the analysis.

* Indicates a statistically significant difference between consumers and producers at the .05 level. Significant ANOVA results included: Pesticide use: $F(1, 269)=3.93$, $p=.049$, $\eta^2=.01$; Price of Food: $F(1, 289)=8.95$, $p<.01$, $\eta^2=.03$; Farm Wages/Working Conditions: $F(1, 281)=8.48$, $p<.01$, $\eta^2=.03$; and How to Prepare/Cook the Food: $F(1, 284)=4.03$, $p=.046$, $\eta^2=.01$.

** Indicates an item of mutual significance. Both consumer and producers ratings ≥6.00.

ings for each topic. Consumers rated Price of Food and Farm Worker Wages/Conditions significantly higher than producers rated these topics; producers rated Pesticide Use and Preparation/Cooking Methods significantly higher than consumers rated these topics (see Table 4 notes for statistical results). Otherwise, there were no significant differences found between consumers and producers in their ratings of desired topics.

Preferred communication methods. Table 5 presents the means, standard deviations, sample sizes, and a sum of consumer and producer ratings for preferred communication methods. Both consumers and producers rated consumer-initiated conversations highly (≥6.00). In addition, producers rated vendor-initiated conversations and banners/signs highly (≥6.00). We computed a one-way between-subjects Welch's ANOVA comparing consumer and producer scores for each preferred communication method. Consumers rated a market-wide coding system and a Facebook page significantly higher than how producers rated these communication methods. Producers rated banners/signs, vendor-initiated conversations, consumer-initiated conversations, and farm pictures displayed at booth significantly higher than how consumers rated these communication methods. Otherwise, there were no significant differences found between consumers and producers in their ratings of preferred communication methods. See Table 5 notes for statistical results.

Discussion

Implications

A number of studies have focused on demographic characteristics of frequent farmers markets shoppers as well as on motivations for buying locally grown foods (Onianwa et al., 2006; Wolf et al., 2005; Zepeda & Li, 2006). Data from this study showed that our consumer sample reflected the characteristics generally described in previous research. However, this study went beyond demographic issues as well. The major aim of this study was to better understand potential ways to enhance information sharing at farmers markets. To our knowledge, this study was the first to survey both consumers and producers about their desired information topics and preferred communication

Table 5. Mean Ratings of Desired Communication Methods

	Consumers			Producers [a]			
Communication Method	*M*	*SD*	*n*	*M*	*SD*	*n*	Total [b]
Customer-initiated conversation*	6.00	1.39	255	6.62	0.92	47	12.62**
Vendor-initiated conversation*	5.65	1.45	251	6.55	0.93	47	12.20
Product label	5.38	1.75	246	5.64	2.06	47	11.02
Booth banner or sign*	5.33	1.46	135	6.65	0.90	46	11.98
Booth display: pictures of farm*	5.26	1.46	248	5.74	1.84	47	11.00
Farmers market website	5.19	1.7	247	5.28	2.09	47	10.47
Flyer, pamphlet, brochure, or card	5.02	1.75	246	5.51	2.02	47	10.53
Market-wide coding system*	4.83	1.72	247	3.32	2.39	44	8.15
Facebook page*	3.38	2.11	248	5.13	2.40	46	8.51
Smartphone barcode at booth	3.33	2.04	248	3.48	2.43	46	6.81
Twitter*	2.42	1.82	235	3.40	2.39	25 [c]	5.82

[a] Vendors who exclusively sell prepared food were excluded from the analysis.

[b] Mean consumer and producer ratings were summed. Total could range from 2 to 14.

[c] This item has fewer producer respondents due to accidental omission when the survey was first launched.

* Indicates a statistically significant difference between consumers and producers at the .05 level. Significant ANOVA results included: Consumer-initiated conversations, $F(1, 299)=8.69$, $p<.01$, $\eta 2=.03$; Vendor-initiated conversations, $F(1, 295)=16.64$, $p<.001$, $\eta 2=.05$; Banners or signs, $F(1, 178)=36.38$, $p<.001$, $\eta 2=.17$; Market-wide coding system, $F(1, 288)=25.45$, $p<.001$, $\eta 2 =.08$; Facebook page, $F(1, 291)=14.07$, $p<.001$, $\eta 2=.05$; Twitter, $F(1, 257)=6.12$, $p=.01$, $\eta 2=.02$; and Farm pictures, $F(1, 292)=3.95$, $p=.048$, $\eta 2=.01$.

** Indicates an item of mutual significance. Both consumer and producers ratings ≥6.00.

methods. The type of desired information was explored both qualitatively and quantitatively and the communication methods were explored quantitatively. These results offer insight into communication topics and methods that producers might utilize in order to inform consumers and engage them in areas of mutual interest.

Qualitative analyses revealed that consumers desired information about local sourcing and organic production across all food categories (produce, dairy, eggs, meat, and prepared foods). This is in line with multiple recent studies that have described consumers' growing interest in purchasing local and organic foods as well as their various motivations for doing so (Hughner et al., 2007; Zepeda & Li, 2006). Animal care, however, is a somewhat novel information-related theme, which included animal living conditions and slaughtering practices, feeding practices, and use of hormones and antibiotics. This theme emerged relative to the dairy, eggs, and meat food categories. Although less often identified as an important consideration for food choice, concern about animal welfare and related animal care practices has become more prevalent over time, and thus might be an important consideration for information provision at farmers markets (Makatouni, 2002). For produce specifically, knowledge of farming and soil inputs was important to consumers; for prepared foods, consumers most wanted to know the ingredients and the specific source of the ingredients. These themes likely relate to issues of food safety, nutrition, and sustainability, topics that consumers repeatedly note are of greater importance (Seyfang, 2006).

Quantitative results showed that both consumers and producers were most interested in sharing information regarding pesticide use, flavor, freshness, food safety, animal welfare, nutrition and environmental impacts. Consumers also wanted to know more information about the seasonality of produce, while producers also wanted to share cooking and preparation methods with their customers. Several topics were rated significantly different between consumers and producers. Consumers rated price of food and farm worker wages/conditions significantly higher than producers did, while producers rated pesticide use and preparation/cooking methods significantly higher than consumers did.

Regarding how best to communicate desired information, both consumers and producers indicated a preference for sharing information via consumer-initiated conversations. In addition, producers were also interested in initiating conversations themselves. Compared to producers, consumers were significantly more interested in obtaining information via a market-wide coding system and a Facebook page. Compared to consumers, producers were significantly more interested in consumer- and vendor-initiated conversations, as well as booth banners and signs, farm pictures displayed at the booth, and Twitter. Several communication methods received moderate ratings ("somewhat important") from both consumers and producers, but these could easily be implemented in a farmers market setting. These feasible communication methods included hanging booth banners or signs, labeling products, displaying photographs of the farm, and developing a farmers market website. Compared to other methods, consumers in our sample did not indicate a strong preference for communicating with vendors via social media or use of mobile devices. However, given the exploratory nature of this study and the increasing popularity of social media marketing practices, it is likely premature to rule out these channels as effective communication strategies between farmers market consumers and farmers.

A final aim of this study was to understand better how consumers choose which booths to purchase foods from when visiting a farmers market. Qualitative analyses revealed several major themes. Many consumers visited booths in order to obtain specific items, such as foods they needed for the week or staples for cooking. This suggests the potential importance for producer to offer recipes along with items for sale to impart information about their potential use in weekly meal preparation. Product qualities, including quality, food and booth appearance, taste, price, and freshness were also major themes. Vendor relationships were also important, and consumers often choose booths based on the friendliness, knowledge, or reputation of the vendor.

Strengths and Limitations

This study builds upon a previous study (Fehrenbach & Wharton, 2012) in which only consumers at a single university farmers market were surveyed about their desired communication topics and preferred communication methods. In addition to using both qualitative and quantitative methodology, the major strengths of the present study were incorporating producer perspectives and surveying many farmers markets across the state of Arizona. However, because we sampled consumers and producers who regularly attend farmers markets in Arizona, our findings might not be applicable to farmers market consumers and producers in other states. The demographic characteristics of our consumer sample were consistent with samples generally described in previous farmers market research (i.e., primarily female, Caucasian, educated, and middle class). However, these characteristics might influence consumers' reported communication preferences; as such, our findings might not be applicable to markets that serve populations with different demographic characteristics. Finally, our findings might not reflect attitudes and preferences of the general population.

Conclusion

This mixed-methods study sheds light on the type of information consumers and producers would like to share at farmers markets, as well as the preferred methods by which they would like it communicated. Farmers markets are an important aspect of both rural and urban communities, allowing consumers access to fresh, local foods and allowing small-scale producers direct access to consumers. Moreover, the market setting facilitates interaction between consumers and producers, through which consumers can learn more information about the foods they wish to purchase and producers can share specific food qualities with customers. These findings may be used to improve communication between consumers and producers, thereby increasing transparency and sales at farmers markets. Future studies, particularly those employing experimental designs, could implement some of these communication topics and methods and examine potential outcomes such as changes in farmers market attendance and booth sales.

Acknowledgements

We wish to thank our colleague, Carissa Taylor, and the many farmers market managers who provided invaluable data collection assistance. In addition, we wish to thank Dr. Jess Alberts for assistance with qualitative data analysis and the Hugh Downs School of Human Communication for providing financial support.

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Appendix A. Consumer Questions

Which farmers' market do you attend most often?

- ☐ Ahwatukee Farmers' Market
- ☐ ASU Tempe Farmers' Market
- ☐ Chandler Farmers' Market
- ☐ Chino Valley Market (Thursdays)
- ☐ Downtown Phoenix Public Market
- ☐ Flagstaff Community Market
- ☐ Gilbert Farmers' Market
- ☐ Mesa Community Farmers' Market
- ☐ Old Town Scottsdale Farmers' Market
- ☐ Prescott Farmers Market (Saturdays)
- ☐ Prescott Valley Market (Tuesdays)
- ☐ Roadrunner Park Farmers' Market
- ☐ Tucson – East at Jesse Owens Park (Fridays)
- ☐ Tucson – Maynard's (Saturdays)
- ☐ Tucson – Oro Valley (Saturdays)
- ☐ Tucson – St. Philips' Market (Sundays)
- ☐ Other (please specify) _____

How often do you purchase groceries at the farmers' market?

- ☐ Never
- ☐ Every few years
- ☐ Once or twice a year
- ☐ Several times a year
- ☐ Once or twice a month
- ☐ Once or twice a week

When you visited the Farmers' Market this past year, how did you decide what booths to purchase foods from?

_____

_____

_____

_____

_____

If you could find out anything about the food available at the farmers' market, what would you like to know?

Fruits/Vegetables: _____

Meat: _____

Eggs: _____

Milk Products: _____

Prepared Food: _____

To what extent are each of the following topics important issues that YOU CURRENTLY CARE ABOUT AND WANT TO KNOW when purchasing your food products?

Food Topics	**1=Not Important; 4=Neutral; 7=Very Important**							
	1	2	3	4	5	6	7	N/A
Animal welfare								
Environmental impacts								
Farm location / distance from market								
Farm size								
Farm worker wages or working conditions								
Flavor								
Food safety								
Freshness								
How to prepare / cook the food								
Nutrition								
Ownership of farm (e.g., family or corporation)								
Price of food								
Production methods: pesticide use								
Production methods: water use								
Seasonality of produce								
Other (please specify)_____								

In what ways would you prefer to learn about the food at the farmers' market?

Communication Methods	**1=Very unlikely to use; 4=Neutral; 7=Very likely to Use**						
	1	2	3	4	5	6	7
Booth display: banner or sign							
Booth display: barcode for smartphone app							
Booth display: pictures of farm							
Booth display: use of a market-wide coding system							
Conversation with vendor: initiated by the vendor							
Conversation with vendor: initiated by you							
Facebook page							
Farmers' market website							
Handouts: flyer/pamphlet/brochure/card							
Product label							
Twitter							
Other (please specify)_____							

What is your sex?

- ☐ Female
- ☐ Male
- ☐ Other

What is your age? _____

Where do you live? City: _____ State: _____ Zip: _____

Are you of Spanish, Hispanic, or Latino origin?

- ☐ No - I am not Spanish, Hispanic, or Latino
- ☐ Yes - Mexican
- ☐ Yes - Mexican-American
- ☐ Yes - Chicano
- ☐ Yes - Puerto Rican
- ☐ Yes - Cuban, Cuban-American

What is your race?

- ☐ White
- ☐ Black or African-American
- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Other (please specify)_____

What is the highest degree or level of school you have completed?

- ☐ Less than a high school degree
- ☐ High school degree or equivalent (e.g., GED)
- ☐ Some college but no degree
- ☐ Associate Degree
- ☐ Bachelor degree
- ☐ Graduate/professional degree (e.g., MA, MD, PhD)

Which of the following categories best describes your employment status?

- ☐ Employed, working 1-39 hours per week
- ☐ Employed, working 40 or more hours per week
- ☐ Not employed, looking for work
- ☐ Not employed, not looking for work
- ☐ Retired
- ☐ Disabled, not able to work

How much total combined money did all members of your HOUSEHOLD earn in 2010? [All in US$]

- ☐ $0 – $4,999
- ☐ $5,000 – $7,499
- ☐ $7,500 – $9,999
- ☐ $10,000 – $12,499
- ☐ $12,500 – $14,999
- ☐ $15,000 – $19,999
- ☐ $20,000 – $24,999
- ☐ $25,000 – $29,999
- ☐ $30,000 – $34,999
- ☐ $35,000 – $39,999
- ☐ $40,000 – $49,999
- ☐ $50,000 – $59,999
- ☐ $60,000 – $74,999
- ☐ $75,000 – $99,999
- ☐ $100,000 – $149,999
- ☐ $150,000 or more

Appendix B. Producer Questions

Which farmers' market do you most often vend?

- ☐ Ahwatukee Farmers' Market
- ☐ ASU Tempe Farmers' Market
- ☐ Chandler Farmers' Market
- ☐ Chino Valley Market (Thursdays)
- ☐ Downtown Phoenix Public Market
- ☐ Flagstaff Community Market
- ☐ Gilbert Farmers' Market
- ☐ Mesa Community Farmers' Market
- ☐ Old Town Scottsdale Farmers' Market
- ☐ Prescott Farmers Market (Saturdays)
- ☐ Prescott Valley Market (Tuesdays)
- ☐ Roadrunner Park Farmers' Market
- ☐ Tucson – East at Jesse Owens Park (Fridays)
- ☐ Tucson – Maynard's (Saturdays)
- ☐ Tucson – Oro Valley (Saturdays)
- ☐ Tucson – St. Philips' Market (Sundays)
- ☐ Other (please specify) _____

How often do you sell your products at the farmers' market?

- ☐ Never
- ☐ Every few years
- ☐ Once or twice a year
- ☐ Several times a year
- ☐ Once or twice a month
- ☐ Once or twice a week

Do you sell meat products? Yes/No
Do you sell eggs? Yes/No
Do you sell milk products? Yes/No
Do you sell prepared food? Yes/No

In what state or U.S. territory does the food you sell come from? _____

Production techniques (check all that apply)

- ☐ Biodynamic
- ☐ Conventional methods
- ☐ Conservation tillage
- ☐ Crop rotation
- ☐ Low pesticide and/or chemical use (e.g., IPM)
- ☐ Naturally grown (certified)
- ☐ Naturally grown (non-certified)
- ☐ Organic (certified)
- ☐ Organic (non-certified)
- ☐ Pesticide free
- ☐ Other (please specify) _____

In your opinion, to what extent are each of the following topics important issues that CONSUMERS SHOULD CARE ABOUT AND WANT TO KNOW when purchasing your food products?

Food Topics	**1=Not Important; 4=Neutral; 7=Very Important**							
	1	2	3	4	5	6	7	N/A
Animal welfare								
Environmental impacts								
Farm location / distance from market								
Farm size								
Farm worker wages or working conditions								
Flavor								
Food safety								
Freshness								
How to prepare / cook the food								
Nutrition								
Ownership of farm (e.g., family or corporation)								
Price of food								
Production methods: pesticide use								
Production methods: water use								
Seasonality of produce								
Other (please specify)_____								

In the future, in what ways are you likely to communicate with consumers about the food you sell at the farmers' market?

Communication Methods	**1=Very unlikely to use; 4=Neutral; 7=Very likely to Use**						
	1	2	3	4	5	6	7
Booth display: banner or sign							
Booth display: barcode for smartphone app							
Booth display: pictures of farm							
Booth display: use of a market-wide coding system							
Conversation with vendor: initiated by the vendor							
Conversation with vendor: initiated by you							
Facebook page							
Farmers' market website							
Handouts: flyer/pamphlet/brochure/card							
Product label							
Twitter							
Other (please specify)_____							

What is your sex?

- ☐ Female
- ☐ Male
- ☐ Other

What is your age? _____

Where do you live? City: _____ State: _____ Zip: _____

Are you of Spanish, Hispanic, or Latino origin?

- ☐ No - I am not Spanish, Hispanic, or Latino
- ☐ Yes - Mexican
- ☐ Yes - Mexican-American
- ☐ Yes - Chicano
- ☐ Yes - Puerto Rican
- ☐ Yes - Cuban, Cuban-American

What is your race?

- ☐ White
- ☐ Black or African-American
- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Other (please specify)_____

What is the highest degree or level of school you have completed?

- ☐ Less than a high school degree
- ☐ High school degree or equivalent (e.g., GED)
- ☐ Some college but no degree
- ☐ Associate Degree
- ☐ Bachelor degree
- ☐ Graduate/professional degree (e.g., MA, MD, PhD)

Which of the following categories best describes your employment status?

- ☐ Employed, working 1–39 hours per week
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- ☐ Retired
- ☐ Disabled, not able to work

How much total combined money did all members of your HOUSEHOLD earn in 2010? [All in US$]

- ☐ $0 – $4,999
- ☐ $5,000 – $7,499
- ☐ $7,500 – $9,999
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- ☐ $15,000 – $19,999
- ☐ $20,000 – $24,999
- ☐ $25,000 – $29,999
- ☐ $30,000 – $34,999
- ☐ $35,000 – $39,999
- ☐ $40,000 – $49,999
- ☐ $50,000 – $59,999
- ☐ $60,000 – $74,999
- ☐ $75,000 – $99,999
- ☐ $100,000 – $149,999
- ☐ $150,000 or more

Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Where urban residents shop for produce

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Submitted December 23, 2013 / Revised March 14 and April 23, 2014 / Accepted June 24, 2014 / Published online September 5, 2014

Citation: Karpyn, A., Tappe, K., Hillier, A., Cannuscio, C., Koprak, J., & Glanz, K. (2014). Where urban residents shop for produce. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 129–141. http://dx.doi.org/10.5304/jafscd.2014.044.009

Abstract

There is limited research documenting the shopping behaviors of urban residents with regard to where they shop for fruits and vegetables. This study sought to: (1) describe characteristics of consumers who shop for produce at supermarkets, alternative fresh food outlets, and farmers' markets; and (2) identify correlates of farmers' market shopping among urban consumers. Participants were recruited from 30 randomly selected residential blocks in West and Southwest Philadelphia, Pennsylvania, to complete a cross-sectional survey. Of 622 residents contacted, 82.6 percent completed a usable survey. Participants were predominantly African American (75.2 percent), single (47 percent), and receiving public assistance (30.1

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Disclosures

This research was supported by Agriculture and Food Research Initiative Grant no. 2010-85215-20659 from the USDA National Institute of Food and Agriculture Human Nutrition and Obesity Program.

The study design was reviewed and approved by the Institutional Review Board (IRB) of the University of Pennsylvania. While the IRB provided a waiver of written consent, each participant was given an information sheet regarding the study.

percent). About half of the respondents reported shopping at farmers' markets (48.2 percent), produce stores (47.9 percent), and/or fruit and vegetable trucks (48.0 percent percent) for produce. Having vouchers for farmers' markets was significantly associated with shopping at those markets, being younger, and not owning a car. Our analysis begins to bridge the gap in understanding how individual-level differences may influence shopping patterns. Findings suggest that financial incentives to shop at farmers' markets can be meaningful contributors to shopping at these venues and may work to support the narrowing of disparities in access to healthy, affordable food.

Keywords
farmers' markets, food access, fruit and vegetables, nutrition, produce, supermarket, food incentives, food policy

Introduction and Literature Review

Fruits and vegetables are important components of a healthy diet and have a protective effect against many chronic diseases (Boeing et al., 2012; Crowe et al., 2011; U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2005). Further, adequate consumption of fruits and vegetables is beneficial for weight management (Boeing et al., 2012; Weerts & Amoran, 2011), a particularly important issue given the national rise in obesity . If trends continue on their current trajectories, obesity rates for adults could reach 44 percent in every state and exceed 60 percent in 13 states within the next 20 years (Trust for America's Health & Robert Wood Johnson Foundation, 2012). Despite the health benefits, there is a substantial deficit in fruit and vegetable intake for most Americans; the USDA recommends that Americans eat 2.5 cups per day, but very few Americans meet these standards (Akmal & Flint, 2013; Cassady, Jetter, & Culp, 2007; Franco, Diez Roux, Glass, Caballero, & Brancati, 2008).

Previous studies point to the connection between the food environment and fruit and vegetable consumption. A 2002 study, for example, found that for each additional supermarket in a predominantly African American census tract, there was a 32 percent increase in fruit and vegetable consumption (Morland, Wing, & Diez Roux, 2002). More recent studies have considered connections between produce consumption and available local retail in both urban and rural geographies. These studies have found that closer residential proximity to a supermarket or grocery store was associated with increased probability of fruit and vegetable consumption (Dunn, Dean, Johnson, Leidner, & Sharkey, 2012) and quantity of fruits and vegetable consumed (Powell, Han, & Chaloupka, 2005; Zenk et al., 2009), especially among disadvantaged urban populations. However, other studies have found more ambiguous relationships between grocery store availability and dietary intake (Boone-Heinonen, Gordon-Larsen, Kiefe, Shikany, Lewis, & Popkin, 2011). Still others have suggested that the relationship between store availability and consumption is complex (Cannuscio, Tappe, Hillier, Buttenheim, Karpyn, & Glanz, 2013).

While there are many studies that examine shopping patterns among urban residents (Hillier, Cannuscio, Karpyn, McLaughlin, Chilton, & Glanz, 2011), research is limited on where Americans, and disadvantaged urban populations in particular, shop for produce. For groceries generally, Americans rely on supermarkets for major stock-up trips, and increasingly depend on supercenters, such as Walmart, for staples (Basker & Noel, 2009). However, research also shows that in predominantly African American neighborhoods that lack large supermarkets, residents rely more on smaller-format grocery stores; these small stores may serve as a means to increase healthy food access for disadvantaged urban populations (Raja, Ma, & Yadav, 2008). Other research considers specialty grocery stores, noting that ethnic minorities often shop at these stores for produce varieties that are culturally appropriate (Adekunle, Filson, Sethuratnam, & Cidro, 2011). At the same time, ethnic minorities demonstrate an unmet demand for produce in their communities (Adekunle, Filson, & Sethuratnam, 2012).

Farmers' markets are another type of food retail outlet that has become more prominent, especially in the sale of produce. Nationally, the number of farmers' markets has quadrupled to

over 7,800 in the last two decades (U.S. Department of Agriculture, 2012). A Five a Day Campaign report, conducted by the California Department of Public Health, found that about one-third of low-income African Americans reported that they shopped regularly at farmers' markets for produce, and that those who made weekly produce purchases at the markets were more likely to meet recommended intake for fruit and vegetables (Keihner, Adkins, & Scruggs,2004). A recent study in North Carolina found that proximity to farmers' markets was associated with lower body mass index (BMI) among youth (Jilcott, Wade, McGuirt, Wu, Lazorick, & Moore, 2011). In addition, farmers' markets that offer electronic benefit transfer have been demonstrated to increase fruit and vegetable consumption significantly among Supplemental Nutritional Assistance Program (SNAP) beneficiaries (Krokowski, 2014). Other studies on the growth of farmers' markets and shopping frequency document the growth trajectory of these shopping outlets nationally (Oberholtzer, Dimitri, & Schumacher, 2012; Young, Karpyn, Uy, Wich, & Glyn, 2011). Prior research, while limited in scope, suggests that farmers' market vouchers are successful at increasing fruit and vegetable purchase and intake (Fair Food Network, 2012; Herman, Harrison, Afifi, & Jenks, 2008; Oberholtzer et al., 2012).

However, among all retail formats, little is known about what portion of fruit and vegetable dollars go to which type of shopping outlet, and why, or how the dollar is split between fresh, frozen, and other types of purchases across outlet types. In order to begin to bridge this gap in understanding produce shopping habits, the present study seeks to: 1) describe socioeconomic characteristics of consumers who choose to shop at supermarkets, alternative fresh food outlets, or farmers' markets for produce, and 2) identify predictors of farmers' market shopping among urban residents.

Applied Research Methods

Sample

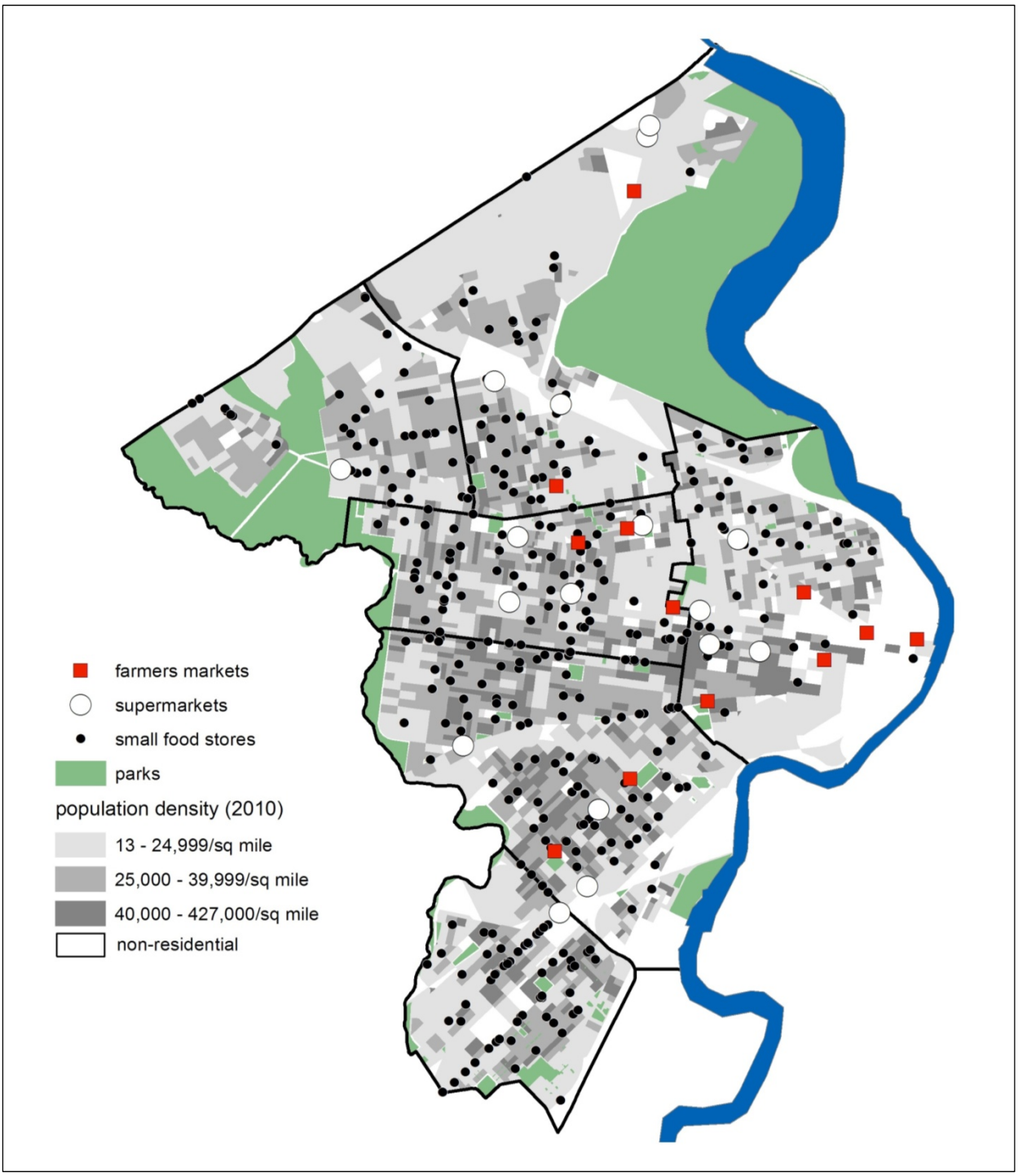
The study area included approximately 18 square miles in six contiguous ZIP code areas in West and Southwest Philadelphia, Pennsylvania (see Figure 1). The population in this section of West and Southwest Philadelphia is 75 percent African American, 15 percent white, 6 percent Asian, and 1 percent Hispanic, and 28 percent of households live in poverty, according to the 2010 U.S. Census. Thirty block segments were randomly selected from all residential blocks in the study area, in proportion to the population within each ZIP code. Attempts were made to contact a member of every household on those blocks. Eligible participants were adults who were the primary food shoppers for their households and who could speak English. Of the 622 residents who were contacted, 82.6 percent (N=514) completed a survey. One collected survey was not usable because of missing data on key outcome variables, leaving 513 surveys for the analysis. The final sample was 66 percent female and 34 percent male, 73 percent African American and 17 percent white. Participants ages ranged from 18 to 97, with a median age of 45. Fewer than 3 percent of participants lived in buildings with 10 or more units. Comparison of the survey sample to 2010 block-level U.S. Census data indicates that the survey participants were fairly representative of their blocks and the study area with regard to race and ethnicity, but the survey sample included a higher rate of homeownership than their blocks and study area. Residents who declined to participate in the study were more likely to be male, African American, and older than were residents who chose to complete the survey.

Measures and Data Collection

A door-to-door survey was conducted during the summer of 2010 for the first phase of a study designed to identify barriers and facilitators to accessing healthful foods and physical activity (Hillier et al., 2011). Trained interviewers administered a 10 to 15-minute survey to eligible respondents, programmed on HP iPAQ 110 personal digital assistants (PDAs) with Pendragon forms 5.1 software (Pendragon Software Corporation, Buffalo Grove, Illinois). Interviewers first visited blocks to identify the street addresses of all houses that appeared to be occupied in order to develop detailed paper log sheets. During the second visit, the research teams left on the door of each occu-

pied residence small "door knocker" signs that described the study and provided a telephone number that residents could call with questions. For multi-unit housing, which was rare in the area, interviewers left study information beside mailboxes or on apartment doors when they were able to gain access. During the subsequent visit, the research team knocked on doors to administer the

Figure 1. Food Retail Landscape, West and Southwest Philadelphia, 2013



survey. To be eligible to participate in the study, individuals had to live on one of the 30 designated blocks, be at least 18 years of age, and be the primary shopper for their household. Once agreement to participate was obtained, interviewers reviewed and provided an information sheet that outlined the purpose of the study and their rights as study participants. If residents chose not to complete the survey, interviewers recorded their sex, approximate age, race, and reason for refusal, if provided. If no respondent could be reached after three attempts, a copy of the survey was left with a postage-paid return envelope addressed to the study center. Respondents were given a US$10 gift card for completing the survey. This study was approved by the Institutional Review Board of the University of Pennsylvania.

The survey recorded demographic characteristics including age, race, sex, educational attainment, household income, household size, receipt of public assistance (Women, Infants, and Children (WIC), Food Stamps/Supplemental Nutritional Assistance Program (SNAP), or cash assistance such as Temporary Assistance for Needy Families (TANF)), car ownership, employment status, marital status, and height and weight. Participants reported their height without their shoes on in feet and inches and their weight without shoes in pounds; these data were used to calculate BMI and BMI categories. The survey included questions about food shopping, the presence of healthful items in the household, and the respondent's physical activity behavior. Specifically, the survey asked where residents procured their fruits and vegetables. Respondents were also asked if they received any farmers' market vouchers in the summer through WIC, SNAP, or the Senior Farmers' Market Nutrition Program (SFNMP). Away from home eating was assessed by asking, "In an average week, how many times do you eat your main evening meal away from home (fast food, take out, or sit-down restaurant)?" The presence of fruits and vegetables in the home was assessed by asking respondents if each of seven commonly consumed fruits and vegetables (bananas, apples, oranges, grapes, carrots, tomatoes and dark leafy greens) "were available in your home in the past week" (see Appendix A).

Statistical Analysis

Responses to the question "Where do you shop for fruits and vegetables?" were categorized into three distinct, mutually exclusive groupings in order to learn more about characteristics of farmers' market shoppers as compared to those who shopped at supermarkets or other specialty stores. Since there were very few respondents who shopped exclusively at farmers' markets, these markets were grouped with other locations. Categories included respondents who shopped at farmers' markets and other locations; those who only shopped at supermarkets, and respondents who reported shopping at "fruit and vegetable specialty stores" but not at farmers' markets. Fruit and vegetable specialty stores included produce stores, fruit and vegetable trucks, and community supported agriculture (CSA) programs that provide weekly containers of a variety of farm-grown products depending on what is in season.

Chi-square analyses were used to provide descriptives about the relationship between demographic characteristics and fruit and vegetable shopping locations. Prediction of farmers' market shopping was analyzed with multivariate logistic regression models, in which demographic characteristics served as the primary predictor variables of interest. Income was not included due to the low response rate for this question. Given many potential predictors, a manual, backwards stepwise regression approach was used, starting with an initial model of all possible predictors, then manually assessing and deleting the least significant term one at a time and comparing the reduced model to the previous model using the likelihood ratio test, which uses the chi-square statistic to evaluate the likelihood that the new model fits the data better or worse than the previous model. If the model fit was significantly worse, the term was returned to the model and the next least significant variable evaluated, until no more variables could be removed without significant reduction in goodness of fit. As a result, nonsignificant covariates that contributed to model strength were retained. The likelihood ratio test for this "final" model relative to the null model (intercept only) is reported. This process also allowed for evaluation of multicollinearity by assessing change in each coefficient and

standard error with each deletion; no substantial value changes occurred, indicating a lack of multicollinearity problems. Only respondents for whom there were no missing data on the model variables were included in this analysis, yielding a sample of 449 for the full model testing.

All statistical analyses were performed using the SPSS statistical software version 19.0 (IBM, Armonk, New York). The number of respondents included in each analysis varied based on availability of data; Ns are provided in each table of results.

Results

The mean age of respondents was 46.3 years and 66 percent were female. Mean BMI was 27.9 and 65.1 percent of participants were classified as overweight or obese. Participants were predominantly African American (75.2 percent) and single (47 percent). About one-quarter of participants (28.5 percent) graduated from college and 30.1 percent were classified as receiving public assistance in the form of WIC, SNAP, or cash benefits such as TANF. While 86 percent of respondents replied that they shopped for fruits and vegetables at supermarkets, only 18 percent(n=94) shopped exclusively at supermarkets for produce. About half of respondents reported shopping at farmers' markets (48.2 percent), produce stores (47.9 percent), and fruit and vegetable trucks (48.0 percent). One in five used gardens (their own or other people's) for produce, 10 percent got fresh fruits and vegetables from corner stores and slightly fewer (8.7 percent) shopped at co-ops for produce. CSAs (community supported agriculture programs) were a produce source for fewer than 5 percent of respondents. In order to shop at farmers' markets, 10.7 percent (n=55) of respondents reported receiving vouchers.

To examine further the characteristics of those shopping at farmers' markets in comparison to supermarkets and other alternative produce retail outlets, responses to shopping outlet were further summarized by outlet type: supermarket only, fruit and vegetable specialty stores (including produce stores and fruit and vegetable trucks), or farmers' markets. Appendix B presents chi-square results for demographic variables and locations where residents procured fruits and vegetables. Findings show that race (p=.02), education (p=.005), and household income (p=.01) variables were significantly associated with fruit and vegetable shopping location preferences; receipt of farmers' market vouchers showed a trend towards increased farmers' market shopping over other locations (p=0.05). Whites and "other" races were more likely to report that they shop at farmers' markets, as were respondents with more education and higher incomes.

Across racial subgroups and levels of education, shopping for produce at farmers' markets was more common than shopping only at supermarkets or at fruit and vegetable specialty stores. According to chi-square analyses, white residents were more likely than African American residents to include farmers' markets as a fruit and vegetable shopping destination (60.3 percent versus 44.7 percent). The proportion of respondents who shopped at farmers' markets was higher among more educated respondents, with college graduates shopping at farmers' markets a full 15 percentage points higher than those with less than high school education. Younger residents (59.0 percent) and those who received farmers' market vouchers (64.8 percent versus 47.2 percent, p=0.05) (see Appendix B) were more like to shop at farmers' markets, as were those with more fruits and vegetables in the household (OR =1.24, p=0.01) (see Appendix C).

Examination of produce store preferences by household income also found that, regardless of income bracket, more residents reported shopping at farmers' markets for produce than at fruit and vegetable specialty stores or solely at supermarkets. Consistent with findings for education, higher-income households reported relatively more frequent shopping at farmers' markets than lower-income households. Distributing farmers' market vouchers appeared to correlate with an increased use of farmers' markets (64.8% versus 47.2%, p=.05). In order to identify correlates of farmers' market shopping among urban residents, a multiple logistic regression model was used (see Appendix C). Receipt of farmers' market vouchers predicted higher likelihood of shopping at farmers' markets, as did younger age and not having access to an

automobile. Despite the differences observed in chi-square analyses, race (p=.29), receipt of public assistance (a proxy for income) (p=.78), and education (p=.13) were not significantly associated with farmers' market shopping after controlling for all other potential confounders.

Discussion

One approach to increasing consumption of fruits and vegetables is to increase access to such foods by expanding the number of retail outlets that sell produce. Disparities in food store access are well documented, with stores that sell a variety of fruits and vegetables often being farther away and fewer in number in low-income communities and communities of color (Algert, Agrawal, & Lewis, 2006; Franco et al., 2008; Inagami, Cohen, Finch, & Asch, 2006; Zenk et al., 2005). Such places have been termed "food deserts" and, according to the USDA, over 29 million Americans live within the designation (Ploeg et al., 2012). Research shows that access impacts dietary behavior, specifically consumption of produce (Bell, Mora, Hagan, Rubin, & Karpyn, 2013). Federal programs such as the American Reinvestment and Recovery Act of 2009 (US$650 million), the Patient Protection and Affordable Care Act (US$100 million), the National Healthy Food Financing Initiative (US$500 million), and state and city grocery financing programs (US$540 million) have bolstered fresh food retail efforts to increase access to healthy, affordable food. These programs help to develop and equip grocery stores, small retailers, corner stores, and farmers' markets selling healthy food in an effort to increase access within food desert communities (Lang, Harries, Manon, Tucker, Kim, Ansell, & Smith, 2013; The Food Trust, PolicyLink, & The Reinvestment Fund, 2012).

Our analysis begins to bridge the gap in understanding how individual-level differences may influence shopping patterns within resource-rich healthy food environments. First, we looked closely at the question "Where do you get your fruits and vegetables?" Residents reported shopping for produce regularly at a number of types of locations including farmers' markets, food trucks, and produce stores in addition to supermarkets. Differences in shopping location (supermarket only, fruit and vegetable specialty store but not farmers' markets, or farmers' markets plus other stores) were found in unadjusted analysis for race, education, and household income. As such, respondents identifying as African American reported shopping with greater frequency at farmers' markets for produce, as did those with lower household incomes and less education.

We also sought to determine which personal characteristics were significant predictors of farmers' market shopping within our sample. Unlike recent national data which show older adults as most likely to purchase at farm-to-consumer venues (Blanck, Thompson, Nebeling, & Yaroch, 2011) , our findings show that younger residents and those who received farmers' market vouchers are more likely to shop at farmers' markets as are those with more fruits and vegetables in the household. While reasons for this difference were not explored, it raises questions about whether the origin is ideology, concern for health, concern for environmental stewardship, or some other factors. However, consistent with the earlier study, we found that race, income, and education in this community do not differentiate farmers' market shopping preferences in our multivariate analyses. The finding indicates that farmers' markets are not places where only high-income residents or those with more education want to shop, but rather serve as an attractive place for residents of all backgrounds to purchase food. As other research has noted, this broad-based appeal is critical to the sustainability of farmers' markets over the long term (Hicks & Lambert-Pennington, 2014).

Having vouchers for farmers' markets in part explained produce shopping preferences. Through federal funding, vouchers are distributed annually through the WIC and Senior Farmers' Market Nutrition Programs (SFMNP) to over 2.5 million recipients, and in the case of WIC FMNP, resulted in over US$14 million in revenue to farmers in FY2012 (U. S. Department of Agriculture, 2013a, 2013b). In Philadelphia, US$2 vouchers called Philly Food Bucks are provided to farmers' market customers, either through every US$5 SNAP purchase at the market or through community partners. During the 2012 season, 78% of vouchers distributed at farmers' markets were redeemed

(The Food Trust et al., 2012). Furthermore, SNAP sales totaled US$63,281.71 for the 2012 season, a 12 increase from 2011 SNAP sales (US$56,496.40); this increase was in part due to increased voucher redemption.

We also found that car owners were less likely to shop at farmers' markets, perhaps because of their greater reliance on supermarket shopping. Earlier studies show that convenience is an important reason customers shop at farmers' markets (Ragland, Lakins, & Coleman, 2011) but that transportation may be a limiting factor in SFMNP redemption (Southeastern Pennsylvania Resource Conservation Development Council and U. S. Department of Agriculture, 2010); our study may suggest that when farmers' markets are easily accessible by foot, the importance of car ownership is mitigated (see Figure 1).

Ultimately, as many public health organizations advocate for policies that will improve food environments, a better understanding of where consumers shop for produce and other healthy foods will foster targeted efforts to improve supply and demand. Further research should continue to develop a more nuanced understanding of shopper behavior, incentive approaches, and specifically the mechanisms that drive shoppers to purchase foods aligned with the Dietary Recommendations for Americans (HHS & USDA, 2005). Our findings suggest that efforts to provide financial incentives to shop at farmers' markets are meaningful contributors to shopping at these venues and may help to support narrowing disparities in access to healthy, affordable food. As incentive programs expand and are tested in other venues such as supermarkets, further research is needed to understand how and why such mechanisms work, and which consumers are most likely to be impacted.

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Appendix A. Sample Survey Questions from Healthy Food and Activity Landscapes Household Survey

General Household

How many people are in your household other than you? We define "household" as anyone who lives in your home and shares most meals or food with you.

a. Adults (over 18):
b. Your own children (under 18):
c. Other children (under 18):

Food Shopping

What is the name and location of the store where you do most of your food shopping? Please identify the specific address or intersection and town/city if it is outside Philadelphia.

Store Name: _____

How much do you usually spend when you shop at this store? [All in US$]

1. Less than $10
2. $10 - $25
3. $25 - $50
4. $50 - 100
5. More than $100

Where do you usually purchase fresh fruit and vegetables? Please select all that apply.

a. corner store
b. supermarket
c. food co-op
d. farmer's market
e. fruit & vegetable truck
f. your own garden
g. garden of friend/neighbor
h. other
i. you don't buy fresh fruit or vegetables

Do you receive farmer's market coupons in the summer (through WIC or seniors program)?

a. yes
b. no

Demographic Questions

Where were you born?

a. Philadelphia
b. United States, outside Philadelphia (please specify state or city)
c. another country (please specify country)

Do you currently receive Food Stamps (Supplemental Nutrition Assistance Program or SNAP benefits)?

a. yes
b. no

How would you describe your current employment status?

a. full-time employment (35 hours a week or more year-round)
b. part-time employment
c. unemployed, actively seeking employment
d. not employed, not seeking employment (retired, home-maker, disabled)
e. other (please specify)

Appendix B. Chi-Square Results for Shopping Locations[a] for Fruits and Vegetables by Demographic Characteristics (*N*=514)

		Shopping Location for Fruits and Vegetables (%):			
	n	Supermarket only (*n*=94) %	Fruit and vegetable specialty stores[b] (not farmers' market participants) (*n*=160) %	Farmers' markets (*n*=245) %	Chi-sq, *p*=
Age					9.83, *p*=0.13
18–29	100	17.0	24.0	59.0	
30–44	142	23.9	28.2	47.9	
45–59	136	17.6	35.3	47.1	
60+	108	16.7	38.9	44.4	
Race					11.69, *p*=0.02
White	78	16.7	23.1	60.3	
African American	360	19.2	36.1	44.7	
Other	52	19.2	19.2	61.5	
Sex					0.97, *p*=0.62
Female	325	17.8	33.5	48.6	
Male	165	20.6	29.7	49.7	
Education					15.06, *p*=0.005
High school or less	187	25.7	33.7	40.6	
Some college	166	17.5	27.7	54.8	
College graduate	140	11.3	33.3	55.3	
Household Income/Year					8.62, *p*=0.01
≥25K	240	18.3	27.5	54.2	
<25K	140	24.3	37.1	38.6	
Any Public Assistance					0.68, *p*=0.71
No	342	18.4	33.3	48.2	
Yes	152	19.1	29.6	51.3	
Own a Car					0.98, *p*=0.61
No	160	18.8	29.4	51.9	
Yes	333	18.6	33.6	47.7	
Employment Status					2.48, *p*=0.29
Not currently working	177	18.6	35.6	45.8	
Working part-time or full-time	315	19.4	28.9	51.7	
Receives Food Market Vouchers					6.17, *p*=0.05
No	445	19.8	33.0	47.2	
Yes	54	11.1	24.1	64.8	

[a] Mutually exclusive categories.
[b] Includes produce stores, fruit & vegetable trucks, and community supported agriculture (CSAs).

Appendix C. Binary Logistic Regression Predicting Farmers' Market Produce Shopping[a]

Predictor variables	Initial Model[b]			Final Model[c]		
(reference category)	OR	95% C.I	*p*-value	OR	95% C.I	*p*-value
Demographics						
Race:						
African American	0.72	0.36–1.46	.37	0.69	0.34–1.37	.29
White	1.22	0.55–2.72	.63	1.10	0.50–2.43	.81
Age	0.98	0.97–1.00	.06	0.98	0.97–1.00	**.03**
Sex (Male)	0.82	0.53–1.26	.36	0.83	0.54–1.28	.40
Marital status:						
Single	0.76	0.44–1.33	.34	0.80	0.46–1.39	.44
Divorced or widowed	1.18	0.66–2.10	.59	1.17	0.66–2.09	.59
Employed	1.20	0.75–1.91	.45			
Education level:						
Education less than high school	0.71	0.43–1.16	.18	0.69	0.42–1.12	.13
College graduate	0.86	0.49–1.51	.60	0.89	0.51–1.53	.66
Kids in the home	0.96	0.62–1.49	.86	1.01	0.65–1.56	.98
Own automobile	0.54	0.34–0.86	.01	0.55	0.35–0.88	**.01**
Receiving any form of public assistance	0.98	0.59–1.64	.95	0.93	0.57–1.53	.78
Receive farmers' market vouchers	2.19	1.10–4.36	.03	2.34	1.18–4.62	**.01**
Food sources						
Eating out:						
Eat one meal away from home each week	1.70	1.00–2.86	.05	1.65	0.98–2.77	.06
Eat two or more meals away from home each week	1.18	0.72–1.94	.51	1.20	0.73–1.95	.48
Report high quality fruits and vegetables at primary shopping location	1.05	0.76–1.45	.76			
Number of fruits and vegetables in home, 1–7	1.24	1.10–1.39	.00	1.24	1.11–1.40	**<.01**
Constant	1.15		.87	1.57		.47

[a] Dependent variable: Binary identification of whether an individual shopped for produce at a farmers' market.
[b] Initial model statistics: R^2=.10 (Cox & Snell). Model $\chi^2(17)$=49.54, p<.001
[c] Final model statistics: R^2=.10. Model χ^2 (15)=49.44, p<.001

Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Factors influencing local food procurement among women of reproductive age in rural eastern and western North Carolina, USA

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Submitted December 31, 2013 / Revised March 13, 2014 / Accepted April 12, 2014 /
Published online August 12, 2014

Citation: McGuirt, J. T., Ward, R., Majette Elliott, N., Lawrence Bullock, S., and Jilcott Pitts, S. B. (2014). Factors influencing local food procurement among women of reproductive age in rural eastern and western North Carolina, USA. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 143–154. http://dx.doi.org/10.5304/jafscd.2014.044.004

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Abstract

Little is known about the barriers and facilitators to local food procurement among women of reproductive age (WRA). Therefore we conducted qualitative interviews with WRA in rural eastern and western NC (ENC and WNC) to learn of factors related to locally sourced food procurement. In-depth interviews were conducted among low-income White, Black, and Hispanic English-speaking WRA (N=62 (ENC: 37; WNC: 23) (18–44 years)). Independent coders used a consensus codebook to double-code all transcripts. Coders then came together to discuss and resolve coding discrepancies, and identified themes and salient quotes. Cross-cutting themes from both ENC and WNC participants included access to local food sources; acceptance of Supplemental Nutrition Assistance Program/Electronic Benefit Transfer (SNAP/EBT); freshness of produce; support for local agriculture; and the community aspect of local food sourcing. The in-depth understanding gained

from this study could be used to guide tailored policy and intervention efforts aimed at promoting fruit and vegetable consumption among low-income WRA.

Keywords
farmers' markets, food stamps, rural, women of reproductive age, local food, SNAP/EBT

Introduction

The prevalence of diet-related chronic diseases, including obesity, diabetes, heart disease, and cancer, disproportionately burdens rural populations in the United States. (Freeman, 1989; Winkleby, Jatulis, Frank, & Fortmann, 1992). The cause of this high prevalence is likely multifactorial in nature, but may be due in large part to insufficient consumption of low-calorie, nutrient-dense foods like fruits and vegetables (Chiuve, Sampson, & Willett, 2011). Rural residents tend to consume fewer fruits and vegetables than their urban counterparts (Lutfiyya, Chang, & Lipsky, 2012), and low-income rural residents have particularly low levels of fruit and vegetable consumption (Lin, 2005). The comparatively lower levels of healthy food consumption among rural residents may be due to disparities in access to healthier foods. Multiple research studies (Fisher & Strogatz, 1999; Larson, Story, & Nelson, 2009; Liese, Weis, Pluto, Smith, & Lawson, 2007; Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007; Sharkey & Horel, 2008) have suggested that rural residents are most often affected by poor access to food stores that offer healthful food products, such as supermarkets and chain grocery stores. One representative national study found that rural areas had 14 percent fewer chain supermarkets than urban areas (Powell et al., 2007), and another study found that U.S. counties defined as "low access" (counties in which at least one-half of the population lives more than 10 miles or 16 km from a supermarket or supercenter) were more concentrated in rural areas (Morton & Blanchard, 2007).

Many strategies have been proposed to increase access to healthier foods in this population. Some have promoted using locally produced foods to improve food access through direct-marketing approaches like farmers' markets and produce stands (Fisher, 1999; McCormack, Laska, Larson, & Story, 2010). While there is little published literature documenting a potential relationship between shopping at local food sources and increased fruit and vegetable consumption, there is evidence that those who shop at farmers' markets report greater produce consumption than those who do not (Jilcott Pitts, Wu, McGuirt, Crawford, Keyserling, & Ammerman, 2013), and evidence for the effectiveness of these sources in increasing consumption (Evans, Jennings, Smiley, Medina, Sharma, Rutledge, Stigler, & Hoelscher, 2012). Thus using local food sources may be a promising approach to improve healthy food accessibility and consumption among low-income, rural residents.

While this may be a promising approach, local food sources are often underutilized by lower-income individuals (Byker, Shanks, Misyak, & Serrano, 2012). The reasons for this remain unclear. In a quantitative study surveying mostly female limited-resource North Carolinians, Leone, Beth, Ickes, MacGuire, Nelson, Smith, Tate, and Ammerman (2012) found that low-income individuals cited not being able to use food assistance program benefits and not knowing of farmers' market in their area as barriers to shopping at farmers' markets, with some racial and geographic differences. Racine, Smith Vaughn, and Laditka (2010) conducted surveys among Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants and found that barriers to farmers' market shopping included lack of farmers' markets close to home and lack of transportation to farmers' markets. While these quantitative findings are informative, there is a need for a more in-depth, qualitative approach to more thoroughly understand the barriers and facilitators to purchasing healthy foods from direct marketing venues (e.g., farmers' markets, produce stands).

Women of reproductive age (WRA) are a particularly important population to study in regard to food access, as women are often the primary food shoppers for their homes (GfK Custom Research North America, 2013), and the dietary choices of WRA are important for fetal development (Daly, Kirke, Molloy, Weir, & Scott, 1995; Ray, Wyatt, Vermeulen, Meier, & Cole, 2005;

Sinning, 1998; World Health Organization [WHO] & Food and Agriculture Organization of the United Nations [FAO], 2004). Among rural WRA, an in-depth understanding of the facilitators and barriers to procuring food at direct-marketing venues such as farmers' markets and produce stands is not currently available. This information could be used to inform future intervention and policy efforts to increase fruit and vegetable purchasing and consumption by promoting use of direct-marketing venues among WRA. Additionally, an assumption is often made that rural women are homogenous in their views of local food sources and the barriers faced in procuring food from these sources. This assumption may be inaccurate, as rural areas are often heterogeneous in terms of geography, culture, and demographics, which might lead to differences in views of local food procurement. Additional information is needed to more clearly understand both the differences and similarities of distinct rural populations. Therefore, we conducted qualitative interviews with WRA in rural eastern and western NC (ENC and WNC) in order to learn of factors related to local food procurement.

Methods

Study Setting and Participants

Qualitative interviews were conducted with women (N=62) regarding their food-shopping patterns. Like many states in the mid-Atlantic region of the United States, there are rural populations in both mountainous areas and coastal plain regions of North Carolina (NC). Women were selected from two separate regions in NC that experience high burdens of chronic disease and are distinct in terms of geography, topography (eastern NC is a coastal plain regions, and western NC is a mountainous region in Appalachia), and culture, to examine whether there were differences and similarities in findings across different rural populations. Women were proactively recruited from two locations: the WNC sample (n=23) was recruited from a WIC clinic at a local health department, and the ENC sample (n=37) was recruited from a Title X Family Planning clinic[1] at a local health department. With the assistance of the WIC dietitian, a study staff member recruited participants in the WNC sample during their visits to the health department for WIC appointments. Participants in the ENC sample marked on a questionnaire that they were interested in the study, and then were called to be screened for potential participation. Participants were reimbursed for their time (ENC: US$40; WNC: US$25). The sample consisted of low-income White, Black, and Hispanic English-speaking women of childbearing age (18–44 years). To be eligible, participants had to be the primary food shopper for their home and be White, Black, or Hispanic, English-speaking WRA (18–44 years). Study procedures and the interview guide received approval from the Institutional Review Board (IRB) at East Carolina University for the ENC sample (IRB # 10-0634), and East Tennessee State University IRB (C0612.21s) for the WNC sample. All participants provided written informed consent.

In-depth Interview Protocol

Interviewers met participants in a community location that was convenient to the participant (e.g., library, health department). During the meeting participants were informed of all aspects of the study and were offered a chance to ask questions. The in-depth interviews lasted 25 to 60 minutes, and were audio-recorded with a digital recorder. Detailed notes were also taken by the interviewer. All participants gave verbal permission to record the interview. The interviews were de-identified, and then transcribed verbatim.

The interview guide was developed through a collaborative effort by the study team comprising researchers from ENC and WNC. Interview topics included neighborhood definitions, travel behaviors, and, of interest for this study, frequency of shopping, venues accessed most frequently, reasons for selecting those venues, direct-marketing venues and local food sources, and procurement strategies. The interview guide was then pilot tested among study staff (with staff administering and

[1] Title X is a federal grant program providing low-income individuals with family planning and related preventive health services.

participating in practice runs of the full interview guide under realistic study conditions), and appropriate revisions were made.

Data Analysis

Five data-rich transcripts were reviewed by two independent coders to develop a consensus code book with potential codes and corresponding operational definitions. All transcripts were systematically double coded in ATLAS.ti software using descriptive codes, with each researcher independently coding the same interview using the consensus codebook. Coders met to revise the codebook, resolve disagreements on how to apply codes, add or delete codes, and come to consensus on how to code segments of text. The research team then identified emerging relevant themes and salient quotations to illustrate each theme. Relevant themes were identified as those that were mentioned by at least three women. To further examine possible racial differences in the factors influencing the procurement of food from the farmers' market, the research team stratified the ENC results by race and examined the differences qualitatively.

Results

Participant Demographics

Details of participant demographics for both the ENC and WNC samples can be found in Table 1.

Table 1. Participant Demographics (Divided by Eastern and Western North Carolina (ENC and WNC))

Variable	ENC = n (%)	WNC = n (%)
Age		
18–20	2 (6%)	1 (4%)
20–29	22 (59%)	12 (52%)
30–39	10 (27%)	9 (39%)
40–44	3 (8%)	1 (4%)
Race		
White	15 (41%)	23 (100%)
Black	22 (59%)	0 (0%)
Employed	18 (49%)	10 (43%)
SNAP Participants	19 (51%)	N/A
WIC Participants	5 (14%)	23 (100%)

In the ENC sample, the majority of participants reported Black race (59%), and the rest reported White race (41%). The mean age of participants was 27.6 years (range, 18–41 years). The participants were evenly split in employment status (employed, 49 percent; not employed, 51 percent), and Supplemental Nutrition Assistance Program (SNAP) use (yes, 51 percent). For the WNC sample, all the participants (100%) were White, which is representative of the population demographics of the county from which they were recruited (97 percent White) (U.S. Census Bureau, 2013). The mean age of participants was 29.7 years

Table 2. ENC Reasons for Procuring Food from Local Food Sources

Theme	Quotation
Freshness of produce	"I love going to farmers' markets. Sometimes I want to go really bad. Like the other day I cooked some string beans, I like to cook fresh food, not out of the can. And I went to [regional supermarket] and I got some, and they were molded. And I had to pick the mold out of them. But if I would have went to the farmers' market, they would have picked them out right there. And most of the time they pick them that day out of the garden. And they taste better."
Perception of lower cost	"I mean, it's pretty cheap, I think it's cheap. Cause there's no middle man, so you cut out that supplier, you know what I'm saying? Yeah, it's from the farm to the table."
Taste of produce	"Usually fruit, like cantaloupes and watermelon cause that stuff doesn't taste as good when you buy it from a grocery store."
Prefer to buy locally	"I like the freshness. I like that it's local, that I didn't have an apple that grew in Peru that traveled all that way using fossil fuels to be a snack. It burns me up, I love the fact that it's local. I'll take local over organic any day."
Ability to buy in bulk	"…because most of the time the vegetables are fresh, and we can get a lot at one time. And we can freeze it and can it for the winter."

(range, 18–42 years), and most participants were not employed (employed, 34 percent; not employed, 57 percent).

ENC Participants

In the ENC sample, half of the women currently shopped at a farmers' market or a produce stand. Most of the women did not have a garden, but some received produce from friends and family. Several themes surrounding the use of local food sources emerged from the ENC participants. From those women who currently shop at these sources, the following themes were identified as reasons for shopping there (number of participants who mentioned): freshness (8), perception of lower cost (3), taste of produce (3), prefer to buy locally (3), and ability to buy in bulk (3). Quotations to illustrate each of these themes are in Table 2.

ENC participants who did not currently procure food from local food sources gave the following reasons: do not know where it is located (9), inconvenient/not close to home or work (9), perception of higher cost (8), not in routine (6), lack of time (6), distrust of produce sold (4), lack of familiarity with the farmers' market experience (3), and do not accept SNAP/EBT (3). Quotations to illustrate each of these themes are in Table 3.

WNC Participants

In the WNC sample, most of the women shopped at farmers' markets or produce stands, had a garden or access to one, and received homegrown produce from friends and family. WNC participants who currently procured food from local food sources identified the following reasons for doing so: prefer to buy locally (5), freshness (4), convenient/close (4), to socialize (3), healthier/organic (3). Quotations to illustrate these themes are included in Table 4.

WNC participants who did not currently procure food from local food sources gave the following reasons: Inconvenient/not close to home or work (7), Have own garden (4), and Do not accept SNAP/EBT (3). Quotes to illustrate these themes are included in Table 5.

Cross-cutting Themes

A few main cross-cutting themes from both ENC and WNC participants developed from the interviews, including access to local food sources,

Table 3. ENC Reasons for NOT Procuring Food from Local Food Sources

Theme	Quotation
Do not know where it is located	"I don't know where to find a farmers' market or anything. I see little stands on the side of the road with like watermelons and strawberries and stuff and produce, but I don't even know where a farmers' market is. No too much knowledge about this stuff. I haven't went looking for it."
Inconvenient/not close to home or work	"If farmers' markets were closer in town, I think I would go there, but they're so far out, and gas is so high…so that's what really, for me, would keep me from going to a farmers' market."
Perception of higher cost	"Well sometimes I mean because it is locally grown, you would think it would be cheaper, but sometimes it's not, just depending on which store has a sale on that week I guess."
Not in routine	"I guess it's, most of the time that I go once a month [to the supermarket], I try to get everything that I need for the month, and 'cause I don't really like to grocery shop like that. I just try to have everything that I need…"
Lack of time	"Yeah so like I guess if I had more time I would eventually visit the farmers' market, but right now I gotta be in and out. That sounds really sad…"
Distrust of produce sold	"I don't know how they handle their food. I know who handles the food in [regional supermarket]. I know they have their hands clean. I know you are supposed to wash your food off before you cook it or eat it anyway, but still I know who handles it."
Lack of familiarity with the farmers' market experience	"Probably if somebody were you know take me out there, or you know introduce me to it than I probably would go. Tell me how good the food is there, the vegetables and the produce."
Do not accept SNAP/EBT	"I don't think farmers' markets take food stamps. So that's why we will go to [regional supermarket] instead of the farmers' market."

Table 4. WNC Reasons for Procuring Food from Local Food Sources

Theme	Quotation
Prefer to buy locally	"It's local and I like to support local. And generally they use less pesticides than big companies."
Freshness	"Just to get fresh organic stuff when it's in season, and to help support our farmers."
Convenient/Close	"It's closer…And then I don't know of another one around. We like to go to get fresh stuff."
To socialize	"Well, you know, socializing. I know pretty much everyone there. I see people I know. And they have stuff for kids. And so my kids go and they have fun. There's lots of kids there that we know. It's more like a play date than a shopping trip. We may get something, and we may not get something. We don't go there primarily to get food. I know I just said I do. I mean I do, I do. I probably five times out of six I do get something, I leave with something."
Healthier/Organic	"I get our potatoes, beans, squash, apples, oranges. I'll get…Sometimes I'll get our meat there because it's actually been slaughtered from animals that the farmers have raised around here, so they don't have all the additives…like you get from [regional supermarket]."

Table 5. WNC Reasons for NOT Procuring Food from Local Food Sources

Theme	Quotation
Inconvenient/Not close to home or work	"Part of it is convenience…It's easier for me to just go in the grocery store."
Have own garden	"Pretty much because my family grows — they have big gardens…so they usually just give me bags of stuff."
Do not accept SNAP/EBT	"I get food stamps, and they usually don't take them. And that's how we get our food."

acceptance of SNAP/EBT, freshness of produce, supporting local, and the social nature of shopping at local food sources. The following are quotations for each theme from each region:

Access (economic and geographic) to the farmers' market
Women in both ENC and WNC reported that economic (financial) and geographic access to farmers' markets were influential in their decisions to procure food from local food sources.

> ENC Participant: "Maybe if they could give out some vouchers for, which they've recently started doing, for farmers' markets and produce stands because this is the thing…When you look at our economy, can I take 20 [U.S.] dollars and go to the farmers' market and buy fresh fruits and vegetables or I can take 7 [U.S.] dollars and go to McDonald's and get everybody a supersized meal. So, if they make food that's healthier for us more accessible, and more economical, I really think people would do it."

> WNC Participant: "Okay, um, it's kind of out of the way for me, and then my transportation, I'm having problems with my transportation right now. So, I try to do basic stuff, you know, in the area, close to home."

Acceptance of SNAP/EBT
Another cross-cutting theme was acceptance of SNAP/EBT at farmers' markets. Women reported preferring to use food sources such as supermarkets where their SNAP benefits were sure to be accepted.

> ENC Participant: "The main reason that I don't [shop at farmers' markets] is because those, they don't accept food stamps, and that is how I pay for my groceries. And that is pretty much the reason…I wish that they took food stamps. You know it would be a lot of money for them, because there is a lot of people that get food stamps…I don't get a lot of stamps, so, I have to pinch, but I think if more places accepted food stamps, a lot of

> people would probably eat more healthier, as far as being able to go to the farmers' market."

> WNC Participant: "As bad as it sounds, my food stamps are a big part of it. If I don't know for sure if they're gonna take them… It is embarrassing to get up there and be like…And they're like, 'We don't take EBT.' So a lot of those places like that, if I don't know for sure, I don't even try. 'Cause I don't wanna get caught up there and be like 'I'm sorry, you have to take all this back."

Supporting Local

Women in both regions shared that an important reason for procuring local foods was to eat locally and to support local farmers and the local economy.

> ENC Participant: "I go to like support local farmers and businesses."

> WNC Participant: "It's local [produce] and I like to support local."

Freshness of Produce

Both ENC and WNC women often mentioned the freshness of produce as a facilitator to shopping at farmers' markets and produce stands.

> ENC Participant: "Because they always have the freshest stuff…Some days I go there, and they just picked the cabbage out of the field. You know, it's always fresh."

> WNC Participant: "We like to go to get fresh stuff."

The Social Nature of Local Food Sources

Many participants discussed the social nature of local food sources as being an important part of the experience. Participants mentioned that they commonly went to shop at local food sources with their family members or friends, and that experiences with home-grown produce were often very social in nature. This was especially true among the WNC participants, where most either had a family garden or got home-grown produce from friends and relatives. Often this interaction was with a person from an older generation. The women also mentioned interacting with the producer as a positive aspect of the farmers' market shopping experience.

> ENC Participant: "I do grow, during the summer; I grew cucumbers and tomatoes… Um, I just find it therapeutic, and it's something that my daughter and I can do together. She loves cucumbers, she could eat two or three a day…My grandparents had a garden."

> ENC Participant: "It's fine, I know on Mother's Day we went to [the produce stand]. It's an outing. I like my child and my boyfriend's children to see where our food comes from, where it's grown, the work that goes into it..."

> ENC Participant: "Yeah, um, I just kind of remember it bein' my best childhood memories, just being in the garden with my grandmother. And, um…you know that feeling of success, and I did it myself…"

One participant mentioned the difficulties of having children and completing shopping tasks:

> ENC Participant: "If I didn't have any children then I would be more willing to take more time and go to get more produce, regardless of the distance, and be willing to do all of those things, and I'd be eating at more restaurants and that kind of stuff. It's just everything just changes when you have a baby, it's all about convenience and savings."

Racial Differences in Procurement

In general, findings in the ENC WRA were similar between blacks and whites. Blacks were more likely to mention quality, taste, and price as reasons for going to the farmers' market compared to Whites. Blacks were more likely to mention the product as expensive, not being in their routine, never having been to the farmers' market, and non-acceptance

of SNAP/EBT as reasons for not going to farmers' markets compared to Whites. Whites more commonly cited lack of trust, shopping not being convenient, and not knowing the location of the farmers' market as reasons for not going to the farmers' market as compared to Blacks.

Discussion

Differences in the procurement of food from local food sources and the barriers and facilitators for doing so were found between the two distinct rural populations. ENC and WNC women were largely dissimilar in their reasons for procuring food from local food sources, with the only highly common reason being the freshness of produce. ENC women appeared to be more attracted to more tangible attributes (price, taste), and WNC women appeared to be more attracted to more intangible attributes (supporting local agriculture, socializing). This may reflect cultural differences in views of the utility of local foods between two distinct geographical regions, and may provide some evidence that views of local food sources are not necessarily homogenous across rural areas. Another factor that might explain these differences are racial and/or ethnic differences in views of local food sources, as the ENC sample had a larger Black population than the WNC sample, which mirrors the actual demographic difference between the two regions. We further examined this issue by splitting the results from the ENC sample by race. While finding some differences, there did not appear to be clear differences by race in citing tangible versus intangible reasons concerning farmers' market use. Therefore cultural differences between the ENC and WNC sample may better explain the differences in this study's findings. Leone et al. (2012) found some differences in reasons for shopping at farmers' markets by race and by rural/urban status. These potential cultural, racial, and geographic differences should be examined further in future studies. Thus, a "one size fits all" approach towards promoting local food sources across different rural areas and different demographic groups may not be the most effective approach. Interestingly, the reasons for not shopping at the farmers' market were largely similar between the two areas, including limited access/convenience and lack of acceptance of SNAP/EBT. These highlight typical problems of living in rural, low-income areas, and strategies should focus on addressing these issues.

Our results were similar to what has been found in previous studies. Leone et al. (2012) found that major barriers to farmers' market shopping for local food procurement included not being able to use food-assistance program benefits and not knowing the location of a farmers' market, factors that were also identified by participants in this study. Racine et al. (2010) found that those with previous farmers' market experience were more likely to shop at farmers' markets than those without previous experience, and that lack of a local food source close to home and lack of transportation were important factors inhibiting shopping at farmers' markets. The findings from our study seem to support these findings, as multiple participants said they would feel more comfortable shopping at farmers' markets if they were more familiar with the experience of doing so. Participants across both ENC and WNC suggested that limited access, including both geographic and economic access, played a large role in their lack of use of local food sources.

Our findings further support the significance of the social aspects of local food procurement, showing that people are influenced to both shop and purchase from local food sources for social reasons. We found that people receive social support in the form of both receiving local food and learning to grow their own foods from both family and friends, and that this is a valuable aspect in their production and procurement of local foods. The human connection experienced in the arena of local foods is a unique aspect of local food procurement (Hinrichs, 2000). The literature seems to support the fact that procurement of local food is an activity of social significance. Previous research has found that sociability was a top reason for shopping at farmers' markets (Sommer, 1979), and that there is more social interaction per visit at a farmers' market compared to a visit to the supermarket (Sommer, Herrick, & Sommer, 1981). These interactions include both vendor-to-patron and patron-to-patron interactions, both of which are important to the consumer. Research has found

that among farmers' market managers, promoting social activity and a sense of community were frequently cited ways they felt the market was making community impact (Oberholtzer & Grow, 2003), and that vendors also benefit from this social interaction with customers through social learning (Hinrichs, Gillespie, and Feenstra, 2004). Another group of case studies (Brown & Miller, 2008; Gillespie, Hilchey, Hinrichs, & Feenstra, 2007) suggested that because local foods are often more visible in public spaces compared to supermarkets, and because of the accompanying variety of social interactions that take place, farmers' markets are valued community institutions that promote civic engagement and social interaction. Further, by providing human connection at the convergence of food production and consumption, farmers' markets provide a source of "social embeddedness," where economics are embedded within social ties and social interaction (Hinrichs, 2000). This social connection, which includes the concepts of reciprocity and trust, is considered a hallmark of direct markets, making it unique compared to the typically less socially interactive supermarket shopping experience (Hinrichs, 2000).

Another prominent finding was the common social interaction that took place surrounding home-grown produce. While limited published research is available on this topic, some studies (Ban & Coomes, 2004; Thomasson, 1994; WinklerPrins, 2002) have suggested that the social value of home-grown food is an important aspect of home food production for many growers, encouraging relationship- and community-building. A study in Toronto found that many gardeners saw sharing food from their gardens as a way to contribute to the lives of others, strengthen social ties, and develop a "common ground" with neighbors (Kortright & Wakefield, 2011). Of the existing research that could be found in the literature on this topic, most of the studies examined urban environments outside the United States. One research study of older adults in rural North Carolina found that garden produce was the most common type of food sharing, with over 80 percent of the sample receiving home-grown produce (Quandt, Arcury, Bell, McDonald, & Vitolins, 2001). They also found that older rural adults viewed food sharing, including garden produce, as an integral part of life in the community (Quandt et al., 2001). Our findings from a rural area of the United States are an important addition to an underresearched part of the literature. Further examination of the social nature of home-grown food in the United States is needed, particularly among rural populations.

Future strategies to encourage use of local food sources among low-income populations might consider improving access to local food sources in low-income areas, raising awareness of the locations of existing local food sources, familiarizing potential consumers with the local food source shopping experience, and increasing the amount of local food sources that offer SNAP/EBT as payment for fruits and vegetables. Local food source outlets often use promotional messages that do not resonate with a low-income audience, and farmers' markets are often perceived as being exclusionary to this group (Govindasamy, Italia, & Adelaja, 2002; Wolf, Spittler, & Ahern, 2005). In turn, the purposive placement of local food venues to increase fruit and vegetable consumption among low-income groups may be undermined. For example, using messages that address issues that are applicable to lower-income audiences are more likely to be effective at promoting behavior change in these populations. The findings from this study might be used to inform and improve the local food source marketing messages aimed at lower-income individuals, particularly WRA. Based on our findings, messages might emphasize the potential price savings of local food sources, the freshness and taste of food sold at local food sources, the social experience of shopping at local food sources, and the safety of produce sold at local food sources.

This study has a few limitations. Participants were recruited using a convenience sample, and the thoughts expressed by those willing to participate may not be representative of WRA in other regions. The two samples (ENC and WNC) were slightly different on some demographic variables (race), which may explain some differences apart from the suggested geographic or regional differences. Our study was also limited to English speakers only, and did not include the important per-

spectives of rural non–English speakers. The strengths of the study include the racially, geographically, and age diverse sample, the in-depth nature of data collection, and the strong qualitative methodological approach.

Conclusions

Our study further elucidates the barriers and facilitators to procuring fruits and vegetables from local food sources among rural low-income women of reproductive age. The findings from this study provide a deeper and more detailed understanding of the contextual factors surrounding local food procurement, a level of understanding that to our knowledge was previously missing from the literature. Future research should aim to build on the observed findings, particularly by exploring ways to overcome the mentioned barriers to local food procurement in light of existing policies and cultural norms, looking at differences in factors related to local food source procurement among various ethnic groups, and further examining the social nature of local food procurement. The findings from this study should help guide future policy and intervention efforts aimed at promoting fruit and vegetable consumption among rural, low-income WRA.

Acknowledgements

Research reported in this publication was supported by Cooperative Agreement Number 5U48DP001944 from the Centers for Disease Control and Prevention and by the National Institutes of Health/National Cancer Institute under Award 5R03CA155362-02. Its contents are solely the responsibility of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention or National Institutes of Health.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Organic farming in West Virginia: A behavioral approach

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Submitted January 13, 2014 / Revised March 11 and April 14, 2014 / Accepted April 18, 2014 / Published online September 5, 2014

Citation: Farmer, J. R., Epstein, G., Watkins, S. L., & Mincey, S. K. (2014). Organic farming in West Virginia: A behavioral approach. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 155–171. http://dx.doi.org/10.5304/jafscd.2014.044.007

Abstract

Although organic production continues to expand and remains the fastest growing segment of the U.S. agricultural economy, demand for organics continues to outpace supply, causing a lag in the supply chain. One of many important elements to remedying this issue is for more farmers to adopt organic practices and/or transition to organic certification. One state well positioned to tap into eastern U.S. metro markets is West Virginia. Our study sought to understand the factors affecting West Virginia farmers' decision to farm organically, as well as the barriers limiting pursuit of certification. Though West Virginia has the highest number of small farms in the U.S., only five farms were USDA organic–certified in 2012. We used a mixed-methods approach to explore the barriers to implementing organic practices and pursuing organic certification. The methods included interviews and mailed surveys, garnering responses from more than 230 farmers in West Virginia. We applied a social-ecological system lens for the development of a statistical model to parse out the major variables affecting transition to organic methods. Our results suggest that the decision to farm organically is largely an economic one, with a *lack of perceived benefits* being nearly as influential as perceived constraints as barriers. We also found that social ties to certified organic farmers reduced the likelihood of others implementing organic production practices. Finally, we propose that the

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Disclosures: This project was funded by the USDA NIFA-OREI Cooperative, award #2011-51300-30709. The lead author is a reviewer for the *Journal of Agriculture, Food Systems, and Community Development.*

choice to farm organically and pursue organic certification be studied in a holistic manner that assesses motives, constraints, and barriers to implementing organic practices in conjunction with relevant contextual attributes (farm characteristics and personal demographics) that affect the decision-making process.

Keywords
organic agriculture, sustainable agriculture, farming, USDA, certified organic, West Virginia, central Appalachia

Introduction

Over the past 40 years, conservationists, environmental advocates, and sustainable farmers and agricultural professionals have promoted the environmental and health benefits of organic agriculture. Empirical evidence supports these efforts and shows that organic techniques tend to reduce the incidence and magnitude of deleterious environmental impacts associated with conventional agriculture (Hole, Perkins, Wilson, Alexander, Grice, & Evans, 2005; Pimentel, Hepperly, Hanson, Douds, & Seidel, 2005; Reganold, Glover, Andrews, & Hinman, 2001; Wortman, Francis, Bernards, Drijber, & Lindquist, 2012). There remains considerable potential for increasing the market share of organic products within the United State food system. Organic production experienced double-digit annual growth in sales (15 percent to 21 percent) between 1999 and 2009, making it the fastest-growing U.S. agricultural sector (Dimitri & Oberholtzer, 2009; Kuminoff & Wossink, 2010). In 2010, organic products generated approximately US$28.6 billion in U.S. sales (Organic Trade Association [OTA], 2011), and the results from several studies suggest that unabated growth in demand continues to outpace the supply of organic products (Constance & Choi, 2010; Cranfield, Henson, & Holliday, 2010; Thilmany, 2006). It is therefore somewhat surprising that more farmers have not pursued organic farming as a strategy to potentially improve their financial well-being.

To understand the factors affecting organic production, we need to develop a better understanding of the circumstances and conditions that facilitate the decision to adopt or convert to organic practices and the decision to complete the USDA organic certification process. Accordingly, our research is oriented around two distinct but related questions:

- First, what factors influence a farmer's decision to adopt organic production methods?
- Second, how do farmers perceive USDA organic certification, and what limits their pursuit of certification?

We analyzed farmers' production choice by applying survey data to institutional models of decision-making (Crawford & Ostrom, 1995; Gintis, 2009; Ostrom, 1998) and complex social-ecological systems (Ostrom, 2007, 2009; Ostrom & Cox, 2010) that collectively reveal the importance of normative motives and the social-ecological context in which decisions are made. Considering this literature, we ask how economic, normative, and social motives affect the likelihood of choosing to farm organically given a set of relevant contextual attributes (e.g., age, education, agricultural training, farm size, setting grew up in).

A Complex Systems Approach to the Study of Organic Farming

While individual differences between organic and conventional farmers are interesting, as of yet, little research has confronted the question as to how social, economic, environmental value, risk perception, and contextual factors jointly influence production choices. More specifically, studies of organic farming choices tend to compare conventional and organic farmers on isolated factors that are likely to have inconclusive results, rather than building a more inclusive model of factors that might affect farming choice. Agricultural production choices in social-ecological systems in turn are better conceived of as the product of a complex bundle of social, ecological, and institutional factors and their interactions that combine to influence those choices. Thus we argue that greater engagement with a social-ecological systems lens (Basurto & Ostrom, 2009; Ostrom, 2009) may help uncover relationships between motives, context, and organic production.

Previous Evidence of Factors Affecting Choice to Farm Organically

The choice to adopt organic farming practices has been studied in a variety of settings, although much of this work has examined the transition from conventional to organic agriculture outside of the United States (Uematsu & Mishra, 2012) and much of it is qualitative. Previous quantitative work has tended to estimate correlations between production and factors such as farm economics, risk, and environmental concern, and contextual factors such as a producer's experience, age, and gender (Darnhofer, Schneeberger, & Freyer, 2005), without considering the larger context in which farmers are making decisions.

This previous work demonstrates that many motivations are consistent across country, continental, and cultural lines. Environmental concerns and pollution issues surrounding industrialized agriculture have been found to facilitate the conversion to organic production both in Europe and North America (Sullivan, Mccann, de Young, & Erickson, 1996; Svensson, 1991). Interest in farm profitability and financial concerns also influence farmers' decisions whether to transition to organic (Henning, Baker, & Thomassin, 1991; Padel, 2011). Furthermore, health concerns, be they for the farmer, family, community, or consumer, also appear to factor into the decision to convert to organic production (Fairweather, 1999; Hall & Mogyorody, 2001). Additionally, personal incidents of environmental health "tragedies" often influence farmers' decisions to transition to organic production (Brophy et al., 2012). Research on certified and noncertified organic farmers also highlights demographic differences between organic producers and conventional farmers, namely age, gender, and size of operation (Burton, Rigby, and Young, 1999; Hall & Mogyorody, 2007; Walz, 2004).

Economic factors such as economies of scale, price premiums, and access to organic markets (both retail and wholesale) play an important role in the choice to adopt organic farming practices (Veldstra, Alexander, & Marshall, in press) or to pursue USDA organic certification (Richards, Acharya, & Molina, 2011; Torres, Marshall, & Alexander, 2013). These economic factors can be divided into two instrumental motives: (1) perceived economic benefits (de Buck, van Rijn, Roling, & Wossink, 2001) and (2) perceived economic costs of change (Kuminoff & Wossink, 2010). Klonsky (2012) found that a decrease in crop yield and an increase in production costs for several organically grown specialty crops in comparison to their conventionally grown counterparts necessitate a market price premium for organics to make up the difference in profit. This is very much crop-dependent, as noted by Reganold et al. (2001), who found organic apple production systems to produce superior economic returns when compared to integrated and conventional approaches. Another cost barrier is human capital (time). Sierra, Klonsky, Strochlic, Brodt, and Molinar (2008) found that among former USDA organic-certified California farmers who chose to decertify, their operational costs — paperwork, record-keeping, and certification — were the most influential factor in this decision.

Research on farmers using organic practices tends to suggest that they are more likely to assume risks (Gardebroek, 2006; Hardwaker, Huirne, Anderson, & Lien, 2004) and are more concerned about the environmental effects of their farm management choices than are conventional farmers (Veldstra et al., in press). Koesling, Ebbesvik, Lien, Flaten, Steiner, and Arntzen's (2004) study found that certified and noncertified organic farmers were more likely to take risks than conventional farmers, noting significant difference between the two groups on production methods, marketing approaches, and finance and investment decision-making. Koesling et al. (2004) also found that farmers more involved in grain production shared a greater perception of risk in relation to institutional systems and/or sources than specialty-crop farmers.

In addition to instrumental motives, previous work suggests a role for normative motives in production choice. For our study, normative motives broadly consist of personal moral valuations that are expected to emphasize the philosophical environmental aspects of organic farming (Svensson, 1991) and social norms that tend to generate incentives supporting an individual to conform to his or her community (Posner

1997; Ramcilovic-Suominen & Epstein, 2012). Darnhofer, Schneeberger, and Freyer's (2005) assessment of the decision to convert to an organic farming system in Austria builds from Fairweather's (1999) classification of farmers (noting organic farmers as "committed" or "pragmatic" and conventional farmers as "hopeful organic," "frustrated organic," or "do not grow organic"), noting that 85 percent of the organic farmers in their study chose the practice based on their environmental convictions. This group of Austrian farmers tended to place economic considerations secondary to their foundational philosophy on farming. In a recent study of organic dairy farmers in Canada, Cranfield et al. (2010) found that environmental motives superceded economic drivers, which the literature often notes as paramount. Building from Cranfield et al.'s (2010) suggestion, our study collected data from farmers employing both conventional and organic farm management practices to provide insight concerning their choices.

Social norms are noted throughout a variety of environmental literature as having consequential impacts on the adoption of pro-environmental behaviors and decisions (Läpple, 2012; Ramcilovic-Suominen & Epstein, 2012). Close association, strong networks, and a high degree of social integration with others performing the behavior are all components that can profoundly affect behavior adoption (DeSouza Filho, Young, & Burton, 1999). Läpple's (2012) survey of organic, former organic, and conventional farmers in Ireland found a significant difference between groups and their association with other organic farmers. Conventional farmers tended to socialize less with organic farmers than the other two groups.

Study Site

This research was conducted in the state of West Virginia, located in the Appalachian region of the southern United States. West Virginia is the least populous southeastern state, with an estimated population of 1,855,413 in 2012 and a relatively low median household income of US$38,482 in 2011, ranking it forty-ninth of the fifty states in terms of household income. West Virginia is dominated by forested mountains, a challenging landscape for row-crop agriculture. Agricultural areas, however, are found throughout the state as the sloping topography lends itself to orchards and other types of fruit production as well as to the production of livestock and specialty crops as defined by the USDA.[1] West Virginia is an appropriate site for the study of variables affecting farmers' decisions to adopt organic practices, due to its plethora of small farmers, juxtaposition to major markets, and topography that is more conducive to growing specialty crops and raising livestock than traditional commodity row crops. West Virginia has the highest percentage of small farms of any U.S. state, with a total of 23,618 farms that average 157 acres (64 ha) per farm, whereas the average U.S. farm is 418 acres (169 ha) (U.S. Department of Agriculture [USDA], 2007a). West Virginia was also one of 22 states that saw a 5.1 percent or greater increase in the number of farms from 2002 to 2007 (USDA, 2007a). According to the USDA (2007b) Agricultural Census, 52.5 percent of farms in West Virginia earned less than US$2,500 and 67.7 percent earned less than US$5,000 annually. The average age of a West Virginia farmer was 58.1, and 99.76 percent of them identified themselves as white. Females are the primary operator of approximately 13.6 percent of farms. Over 65 percent of West Virginia farmers hold an off-the-farm job. Nearly 47 percent had Internet access on the farm.

Methods

Research Design

Our study had two primary research questions: (1) what factors influence a farmer's decision to adopt organic production methods? and (2) how do farmers perceive USDA organic certification and what limits their pursuit of certification? We used a two-phase sequentially embedded mixed-methods research design as outlined by Creswell and Plano

[1] According to the USDA, specialty crops are, "fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture). Eligible plants must be intensively cultivated and used by people for food, medicinal purposes, and/or aesthetic gratification to be considered as specialty crops" (USDA, 2013).

Clark (2007) and similar to Cranfield et al.'s (2010) design for their study of organic farmers in Canada. First, interviews were conducted with 14 farmers in West Virginia in order to develop a relevant questionnaire that was then administered to farmers in West Virginia.[2] The sequential approach allowed for important refinements of research instruments to the target population, while mixed methods (interviews and survey administration) allowed for greater breadth in data collection (Greene, Caracelli, & Graham, 1989). This paper presents the results of the phase 2 survey data.

Survey and Analysis Methods

Survey development and administration. We developed a questionnaire based on analysis of interview data and a literature review. The questionnaire had five sections.[3] Section 1 sought operational information, while section 2 contained questions and prompts that pertained to production methods and farming philosophy, and risk perception prompts that were based on those of Koesling et al. (2004). Section 3 gathered details on market variables and distribution outlets, farmers' perception of demand for certified organic products in their area, and distribution venues. Section 4 solicited data and perspectives on USDA organic certification and the process. Section 5 included demographic questions. The questionnaire underwent review and revision, with comments solicited from scholars and an expert panel composed of conventional, organic, and specialty-crop farmers.

To develop a survey recipient list, the research team used a variety of mechanisms to compile a list of West Virginia farmers focused on specialty crop and animal production. A participant list from a conference organized by the West Virginia Small Farm Center supplied the greatest number of contacts. This was supplemented with contact information from online databases and solicitations to state and regional agricultural groups. Our contact list was developed to include only those West Virginia farmers primarily engaged in the production and distribution of specialty crops, animal products, and nontimber forest products, as opposed to traditional commodity row-crop farmers. That said we undoubtedly missed a number of potential farmers and our lack of access to a complete list of West Virginia farmers does limit the generalizability of our results and weakens the conclusions that can be made.

To garner the highest possible response rate, we employed a modified Tailored Design Method for the distribution of the mailed questionnaire (Dillman, Smyth, & Christian, 2009). Mailing 1 occurred on January 25, 2012, with the fourth and final mailing distributed on February 14, 2012. As completed questionnaires were returned, data were entered into a Qualtrics (Qualtrics, LLC) online survey form in order to decrease the number of input errors that may occur when using a traditional spreadsheet system.

Survey Analysis. A behavioral approach to the study of the organic farming decision-making process begins with the general hypothesis that individuals will invest in change (in this case, adopt organic practices) as the perceived benefits of organic farming increase relative to conventional alternatives (Basurto & Ostrom, 2009; Poteete, Janssen, & Ostrom 2010). It must be noted that although this general hypothesis constitutes the core of this investigation, it is not tested in this research. Rather, it is assumed and used to construct an empirical model of the motives and contextual attributes that influence the choice to adopt organic farming practices. In accordance with the organic farming and environmental decision-making literature previously identified and discussed, our approach analyzes the data based on five types of motives (including both instrumental and normative categories) that may influence the perceived utility of organic farming: (1) perceived economic benefits, (2) perceived economic costs of change, (3) general risk tolerance, (4) personal moral valuations of the alternatives that are expected to emphasize the environmental aspects of organic farming, and (5) social norms that tend to generate incentives supporting conformity. Thus, the adoption of organic farming practices

[2] A detailed reporting of all of the methods and the interview results can be found in Farmer, Peters, Hanson, & Boettner (2013).

[3] The full questionnaire is available in Farmer et al. (2013).

would be predicted to increase with growing levels of environmental concern, perceived benefits, risk tolerance and socialization with organic farmers. Decline in adoption of organic practices would be attributed to perceived increase in economic constraints and inadequate knowledge or skill needed to implement organic production. In other words, choice to adopt and continue use is a function of the motives conditioned on the context.

We employed a variety of statistical analyses to compare the two groups (noncertified organic farmers vs. conventional farmers), including simple descriptive statistics, analysis of variance (ANOVA), and chi-square. To assess the factors associated with the choice to pursue organic farming practices, we built a predictive (logistic) model using the social-ecological systems framework that includes a set of instrumental and normative motives and potentially relevant contextual attributes. The dependent variable is a binary (two-part) measure that indicates whether a farm uses conventional farming practices (0), or organic techniques (1). Independent variables incorporated into the logistic regression models (a statistical analyses that shows the relationship between several variables) included previous agriculture training, educational attainment, age, where one grew up, farm size, percent of income provided by farm sales, years farming, overall income, gender, and off-the-farm employment, all of which are summarized in Table 1. With the exception of socialization, each motive is an indicator composed of three Likert-scale items. Each motive was measured using a principal component factor analysis to see how variables were linked and related. Each set of items converged on a single-factor solution that accounts for a minimum of 68.7 percent of the common variance.

We estimate three separate logistic (predictive) regression models. The first model was chosen as a function of the five motives we predicted to directly affect the perceived utility of organic farming. The second and third models consider the context in which a decision is made by including theoretically relevant contextual attributes. Although model 1 is the most conservative, it ignores relevant covariates and likely suffers from omitted variable bias. Model 2 includes all the theoretically relevant motives and retained contextual attributes on the basis of a backwards selection ($p<0.2$) in an attempt to offset the relative weaknesses of each. Model 3, which includes a wider range of potentially influential attributes, faces more significant statistical power constraints due to the inclusion of so many variables.

Results

Questionnaires were mailed to 884 potential participants. Among the mailed questionnaires, 65 were returned for insufficient addresses, and 68 were returned because the recipient no longer qualified to participate in the study. Thus, 751 addresses were deemed valid. We received 219 useable surveys, a 29.2 percent response rate. Participants left some questions blank; therefore there are fewer than 219 responses for certain questions. Respondents initially were classified according to membership in one of four categories: conventional farmers (n=120), those in transition to USDA organic certification (n=5), noncertified organic farmers (n=91), and organic exempt (those following all National Organic Program standards but who have gross sales less than US$5,000 per year) ($n$=3). Farmers in transition, noncertified organic, and organic exempt were grouped (n=99) based on general similarities in management practices and were compared to their conventional counterparts. Sample sizes of farmers in transition and organic exempt were too small to statistically compare to the noncertified organic farmers. Given that all three groups are practicing organic methods, but are not currently certified, we labeled them noncertified organic farmers (NCOF). The five certified organic farms in West Virginia were not included in the grouping in order not to confound the analysis.

The survey results are presented in three main subsections. First, farm details and respondent demographics are provided. Analysis and corresponding results that answer the first research question are then given, followed by that for the second.

Survey Results

Respondent characteristics. The demographic results comparing conventional farmers (CF) and NCOF are presented in Table 2, providing an overview of farmer characteristics (percentages given in percent of valid responses). More than half of the respondents used conventional methods (54.7 percent/*n*=120), while 45.2 percent (*n*=99) used organic methods but were not USDA-certified organic. Additionally, 2.7 percent of participants indicated that they had once been USDA-certified organic and that they had let their certification expire. These individuals still maintained organic management practices.

The median acres farmed was 20 (8 ha), and 84.9 percent of farmers owned all of their land. The responsibilities for running the farming operations generally fell to both males and females, with 48.9 percent of respondents noting men and women share the responsibilities, 37 percent noting that only males hold the responsibility, and 11.4 percent noting that only females hold this responsibility. Almost three-quarters of respondents (72.6 percent) reported having Internet access on the farm, with 55.7 percent indicating that they use it for farming operations. Respondents reported both their gross and net farm income, with approximately one-third of respondents having grossed US$2,500 or less, and about one-half grossing US$5,000 or less. Net income, as expected, is skewed even lower; approximately 60 percent of respondents report a net income of US$5,000 or less. When asked whether they use USDA programs such as the Environmental Quality Incen-

Table 1. Description and Summary Statistics of Parameters Included in Logistic Regression Models (*N*=141)

Variable	Description	Mean	Std. Dev.	Median	Minimum	Maximum
Organic practices	Adoption of organic practices (1=Yes; 0=No)	0.49	0.50	0	0	1
Environmental concern	Composite measure of environmental concern	0.00	0.96	0.41	–4.73	0.63
Economic constraints	Composite measure of perceived economic constraints	0.00	0.98	0.20	–2.40	1.50
Economic benefits	Composite measure of perceived economic benefits of organic farming	0.00	0.97	–0.07	–1.24	1.74
Risk tolerance	Composite measure of general risk tolerance	0.00	0.97	0.17	–3.40	1.24
Socialize	Level of socialization with organic farmers (1=Low; 7=High)	3.91	1.71	4	1	7
Gender	Female decision-maker (1=Primary or shared; 0=No)	0.62	0.49	1	0	1
Income (US$)	Household income (1=$0–$19,999; 6=$100,000+)	3.48	1.55	3.00	1	6
Nonfarm employment	Second off-farm employment (1=Yes; 0=No)	0.62	0.49	1	0	1
Years	Years of direct involvement in farming operations	16.59	13.41	12	1	55
% Income from farm	Percent of income derived from farming operation	18.78	25.40	8.00	0	100
Size	Natural logarithm of farm size (acres)	2.67	1.89	2.71	–2.06	7.60
Age	Age of respondent (years)	53.57	13.79	55	18	84
Urban	Raised in urban/suburban setting (1=Yes; 0=No)	0.36	0.48	0	0	1
Bachelors	Completed at least a bachelor's degree program (1=Yes; 0=No)	0.60	0.49	1	0	1
Ag. Training	Formal agricultural training (1=Yes; 0=No)	0.43	0.50	0	0	1

Note: 1 acre = 0.4 ha

tives Program (EQIP), Conservation Reserve Program (CRP), subsidies, or insurance, 30.6 percent of farmers indicated yes, 61.6 percent indicated no, and 7.8 percent of participants failed to respond to this question. Within West Virginia, the communities of Morgantown, Charleston, Romney, Fairmont, and Lewisburg were common points of distribution. Additionally, a limited number of farmers indicated they distribute to the Baltimore (n=9) and Washington, D.C. (n=3) market areas.

Research Question 1: What factors influence a farmer's decision to adopt organic production methods?

Based on chi-square results, NCOF are younger, share farm responsibilities more equally between men and women, farm smaller acreages, have attained higher levels of education, are more likely to have access to the Internet on the farm, and grew up in suburban or urban areas.

Logistic regression was used to identify the motives and contextual factors that influence the choice to adopt organic practices. The results and model diagnostics are presented in Table 3. Model 1 includes only the economic and normative motives that are presumed to directly affect choice, while models 2 and 3 include additional contextual factors. The models can be compared using the model specification statistics found at the bottom of the table, as well as a likelihood ratio test given their nested nature. In general, preferred models will have higher R^2, log-likelihoods, and correctly classify a larger percentage of cases. They will also have lower AIC (Akaike information criterion) and BIC (Bayesian information criterion) values (Raftery, 1995). However, the strongest statistical guide for selecting among models comes from the likelihood ratio test that is distributed asymptotically chi-squared and can be used to compare the fit of nested models against the appropriate critical value. The results of these tests suggest that models 2 (LR=16.554, df=5, p=0.005) and 3 (LR =23.690, df=10, p=0.008) are preferred to model 1, but that model 3 does not provide a statistically significant

Table 2. Summary Demographic Statistics and T-test for CF vs. NCOF
(numbers given are valid percent of n=219)

Variable	Subvariable	CF Mean / %	NCOF Farmer Mean / %	p-value (ANOVA)
Age		58	52.34	.006*
Education	No high school diploma	4.2%	1.0%	.005*
	Post–high school training	35%	31.3%	
	Bachelor's degree	23.3%	36.4%	
	Post-bachelor's degree	30.8%	24.2%	
Off the farm job		57.5%	60.6%	.542
Years involved with farming operation		29 years (medan=26)	18.29 years (median=12)	.000**
Setting grew up in	Rural	73.3%	48.9%	.001**
	Suburban	15.0%	36.4%	
	Urban	5.8%	9.1%	
First generation on the farm		56.7%	81.6%	.639
% of income from farming operation		19.18%	21.5%	.621
Household income (US$)	$0–$19,999	5.8%	11.1%	.002**
	$20,000–$39,999	12.5%	28.3%	
	$40,000–$59,999	26.7%	22.2%	
	$60,000–$79,999	11.7%	14.1%	
	$80,000–$99,999	17.5%	4.0%	
	$100,000+	13.3%	11.1%	

*p<0.05 (less than 5%), **p<0.01 (less than 1%).

Table 3. Logistic Regression Results for the Likelihood of Adoption of Organic Farming Practices

Independent Variables	Expected Sign	Model 1	Model 2	Model 3
Environmental concern	+	0.487**	0.394	0.292
		(0.234)	(0.252)	(0.267)
Economic constraints	–	–0.639***	–0.700***	–0.493*
		(0.234)	(0.256)	(0.275)
Economic benefits	+	0.673***	0.601**	0.518*
		(0.241)	(0.267)	(0.282)
Risk tolerance	+	0.107	0.082	0.04
		(0.233)	(0.249)	(0.269)
Socialize	+	–0.231**	–0.222*	–0.261*
		(0.116)	(0.129)	(0.136)
Gender	+		0.701	0.597
			(0.432)	(0.468)
Income	+		–0.303**	–0.252
			(0.150)	(0.160)
Nonfarm employment	??		0.924*	0.954*
			(0.485)	(0.577)
Years farming	–		–0.038**	–0.026
			(0.017)	(0.019)
% income from farm	??		0.012	0.013
			(0.009)	(0.010)
Farm size	+			–0.21
				(0.128)
Age	–			–0.014
				(0.020)
Urban	+			0.615
				(0.467)
Bachelors	+			0.498
				(0.472)
Ag. training	+			–0.187
				(0.450)
Constant		0.809*	1.212	1.919
		(0.484)	(0.827)	(1.613)
N		141	141	141
McFadden's R^2		0.145	0.23	0.267
Log-Likelihood		–83.506	–75.229	–71.661
AIC		179.011	172.458	175.321
BIC		196.704	204.894	222.502
Mean VIF		1.27	1.28	1.40
Correctly classified		71.63%	80.85%	78.72%

Standard errors are reported in parentheses.
*p<0.10 (less than 10%), **p<0.05 (less than 5%), ***p<0.01 (less than 1%).

better fit than model 2 (LR =7.136, df=5, p=0.211). We argued ex ante above that model 2 was the best fit, and we find statistical support for this argument. As a result, model 2 parameter estimates are used in the remainder of the analysis, including marginal effect estimates and associated plots (Figures 1 and 2).

Marginal effects were calculated using model 2 parameters, with all continuous variables calculated at their mean (d=discrete change; *p<0.10, **p<0.05, ***p<0.01). Broadly speaking, the results suggest that farmers choose to adopt organic practices on the basis of economic motives. Both economic constraints and economic benefits were significant and in the expected direction. The effects of economic benefits predicted probability of adopting organic practices as a function of perceived economic benefits through the interquartile range. It reveals, unsurprisingly, that a farmer is most likely (~69 percent) to adopt organic techniques when the perceived benefits are high and costs are low, and least likely (~23 percent) when these are reversed. At a given level of perceived economic benefits, the predicted probability of using organic farming methods declines by approximately 10 percent for each quartile change in perceived costs. Although the marginal effects of environmental motives and risk tolerance are positive, neither of these is statistically significant in models that contain controls (our preferred models). The most surprising finding, however, is that as a respondent's level of interaction with certified organic farmers increases, his or her likelihood of adopting organic practices declines. This result is robust across all three models.

Several contextual attributes are also relevant with respect to the organic farming decision. These include total household income, off-farm employ-

ment, and the number of years an individual has been involved in the operation of a farm. As income increases, the likelihood of adopting organic farming techniques tends to decline, although as income from secondary sources increases, the likelihood of organic adoption increases. Approximately 60 percent of new farmers are predicted to adopt organic techniques, which falls to less than 50 and 30 percent after 20 and 40 years, respectively.

Research Question 2: How do farmers perceive USDA organic certification and what limits their pursuit of certification?

We asked participants about their opinions concerning interest in USDA organic certification. The battery contained 14 Likert-style items (measured on a 1 to 7 fully disagree to fully agree scale) and had a Cronbach's alpha value of 0.794. The lack of availability of organic animal feed ranked highest, and when comparing the responses of the CF versus NCOF, a statistical difference was found with seven of the prompts and their respective scores. Table 4 details each item on the scale, the mean scores of the NCOF vs. the CF, and the results of the one-way analysis of variance comparing NCOF and CF scores and the principal component analysis.

A principal component analysis (presented in Table 4) on the battery of questions detected the presence of three factors with eigenvalues greater than one (both had Cronbach's alpha score above .80). Bartlett's test of sphericity was significant at the .000 level with a KMO test for sample adequacy at .781. We used Bartlett's test to confirm the significance of the first PCA axis and the broken-stick rule to determine how many additional axes to interpret (Jackson, 1993; Legendre & Legendre, 1998). The broken-stick approach can overestimate dimensionality (Peres-Neto, Jackson, & Somers, 2005); we chose to err in

Figure 1. Predicted Probability of Adopting Organic Farming Practices as a Function of Perceived Economic Benefits
Low, intermediate, and high are calculated as the 25th, 50th, and 75th percentile. All other values are held at their mean using model 2 parameters.

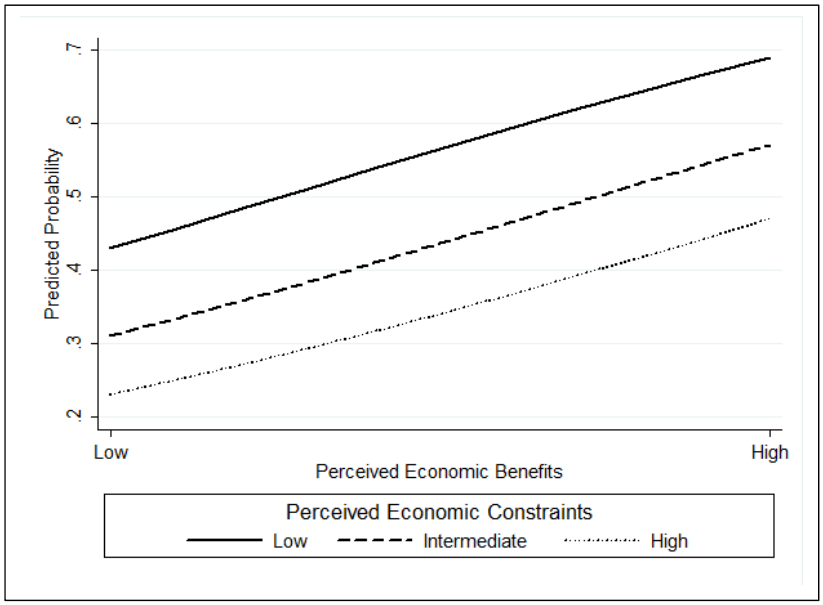
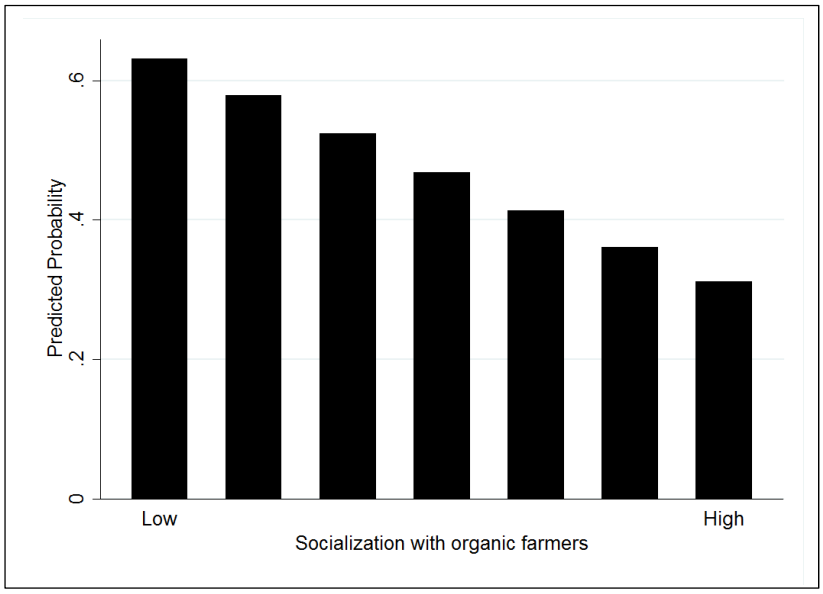


Figure 2. Predicted Probability of Adopting Organic Farming Practices as a Function of Socialization with Organic Farmers
All other variables are held at their mean using model 2 parameters.



the direction of higher dimensionality. The two factors are named based on the factors with heavy loading at .300 or greater. Factor 1 had a Cronbach's alpha score of .830 and explained 28.93 percent of the variance. Factor 1 items were related to a lack of interest in organic methods, interest in government certifications or programs, learning and/or changing farming methods, and lack of interest among one's sales outlets; we entitled factor 1 *no interest in the organic business*. Factor 2 had a Cronbach's alpha score of .809 and explained 22.56 percent of the variance. This factor included a perception that the certification process was extremely time-consuming and expensive, animal feeds were hard to get, the benefits were not worthwhile, and the certification had little meaning; we entitled factor 2 *process and perspective barriers*.

Discussion

Our study sought to develop a better understanding of the factors that affect the adoption of organic practices and barriers to organic certification among specialty crop producers in West Virginia. Farmers in West Virginia face similar pressures and challenges as other farmers growing in similar mountainous, rural areas with geographic barriers to market outlets. This study presents a quantitative assessment of U.S. (West Virginian) organic farmers' choice to pursue organic management and a first step towards the use of a social-ecological system approach to inform a more inclusive model of organic farming decisions.

Table 4. ANOVA and PCA Results from Likert Scale Assessing Interest in Pursuing Organic Certification and Production

Prompt	NCOF Mean	CF Mean	ANOVA	Factor 1	Factor 2
– I have no interest in using organic methods for production on my farm.	1.67	3.36	.000**	**.882**	–.074
– I simply have no interest in organic production or methods.	1.60	3.58	.000**	**.857**	–.069
– Organic farming practices are not effective/practical for my crop(s).	2.07	4.03	.000**	**.737**	.032
– The individuals that purchase my farm products would not pay for food grown/raised using organic methods.	3.12	4.43	.000**	**.637**	.134
– I have no interest in learning about new farming techniques that would be required to pursue USDA organic certification.	2.70	3.33	.044*	**.568**	.282
– I am using practices that far surpass the USDA organic certification requirements.	4.69	2.89	.000**	**–.502**	.169
– I have no interest in changing the management systems already in place on my farm.	3.09	3.56	.109	**.445**	–.040
– I am not interested in government certifications or programs.	4.36	4.51	.648	**.325**	.226
– I find the USDA organic certification process extremely time consuming.	5.20	4.91	.289	–.035	**.833**
– I believe the costs associated with becoming USDA-certified organic to be extremely high.	5.25	5.13	.671	.103	**.782**
– I do not believe the benefits associated with USDA organic certification are worth the time and expense.	5.12	4.72	.198	.160	**.685**
– Availability of organic animal feed is a challenge for raising livestock organically.	5.74	5.53	.532	–.073	**.684**
– I find maintaining the certification paperwork extremely time consuming.	5.42	4.98	.132	.007	**.606**
– I feel that the organic certification by the USDA has been co-opted and is no longer meaningful.	5.16	4.02	.000**	–.136	**.439**

* $p<.05$ level, ** $p<.01$

Our survey results indicate that NCOF in the study are generally more concerned about the production of "high-quality foods" and the fertility and "health of the land" they farm than their conventional counterparts. In addition, risk attributes assessed in the survey indicated a self-reported willingness to take greater risks in farm management practices for those classified as NCOF. These findings parallel those of Koesling et al. (2004), who found that Norwegian organic crop farmers have a heightened willingness to assume risks when adopting farm management strategies.

Beyond noting that constraints were significant, the results parallel prior research that highlights the differences between conventional and organic farmers. Noncertified organic farmers in our study were younger and more often included females in operational decisions, had farm smaller acreages, had higher levels of education, had greater access to the Internet and used it for farming purposes, and grew up in urban or suburban areas when compared to CFs. These findings correspond to previous findings in the organic literature that found parallel results in studies that compared organic to conventional farmers (Burton et al., 1999; Veldstra et al., in press; Walz, 2004).

The results of our research contribute three particularly salient findings that merit additional discussion: (1) perception of economic benefits associated with organic production are as consequential for choice as perceived economic constraints; (2) although many farmers practice organic production, perceptions of the organic certification process and its components limit certification; and (3) knowing an organic farmer seems to undermine the adoption of organic practices.

The choice to adopt organic production and certification is often viewed in terms of constraints (Veldstra et al., in press). Studies tend to begin with the assumption that given higher economic returns and positive environmental externalities that all farmers would choose to farm organically (unless one or more factors acted to constrain their transition). Our research demonstrates, however, that at least in the case of West Virginia, the effects of perceived economic benefits are as critical as the perceived effects of economic constraints. Cranfield et al. (2010) shared a similar finding, noting that, "the profit motive has become a more important factor underlying the decision to convert in recent times" (p. 304). Specifically, our results indicate that the choice to farm using organic techniques also depends upon a belief, whether founded or not, that the production of organic products will generate additional economic benefits. Clearly not all farmers in West Virginia hold this belief, and in West Virginia efforts by organic proponents to limit barriers and constraints are likely to have little effect on farming decisions unless accompanied by a perception of increased economic benefits.

Nonetheless, our analysis indicates potential constraints that may inhibit the pursuit of USDA organic certification. Data from many respondents suggest that farmers are skeptical or do not find a good fit with the program. As multiple farmers noted in the survey, they are pursuing certifications that parallel the USDA organic label. Specifically, question 25, an open-ended question, provided equally strong themes relating to positive and negative perspectives of USDA organic; some individuals felt that a product bearing the USDA Organic logo has met the strictest standards currently available for organic food, while just as many perceived it to be not necessarily sustainable and only useful for commercial-scale organic production and operations.

The most surprising result of this research was that increasing levels of socialization with certified organic farmers reduces the likelihood of transitioning to organic production. This in turn suggests that certified organic farmers may not be seeing increased revenues. If this is the case it may correspond to a general absence of pro-organic social norms and attitudes in West Virginia, which in a sense is a lack of market. It is also possible that current organic producers do not experience or at least share positive economic results with their peers, and thus provide information that may undermine transitions to organic production within a group of farmers. As noted in Cranfield et al. (2010), the lack of social acceptance in relation to organic practices may be a "significant problem and challenge" (p. 304) to adopting organic management systems where negative pressures seem insurmountable. Finally, the vast majority of

our participants had small farms and distributed their farm products directly to consumers as opposed to selling through a food hub or to a wholesale distributorship. This result is similar to Torres, Marshall, and Alexander's (2013) recent findings of noncertified organic farmers. As they note, the need to certify tends to increase as the relationship between the farmer and the consumer is minimized or severed, which is often the case when wholesale distribution is utilized. Without the farmer-consumer relationship, price premiums and sales are less likely to be realized without a well-known organic label such as the USDA certification logo (Janssen & Hamm, 2012). Where our results diverge from Torres et al. (2013) is with their finding that the probability of certifying increases as one is further removed from the market. For our study, it may be the case that the rural areas of West Virginia are too far removed with no real access to an aggregation and distribution facility.

Our analysis adds to the discourse on environmental decision-making as it relates to sustainable agriculture. While the results regarding farmer's choices in West Virginia are interesting in and of themselves, their most significant contribution is to situate the choice of organic production in the context of a complex social-ecological system (Ostrom, 2007, 2009). Farmers in West Virginia, who are often operating under marginal conditions and serving limited local markets, are clearly different from California's massive agricultural industry or the cornfields of Indiana. Given these rather obvious differences, neither academic scholars nor policy-makers should be surprised to find that some attributes of the social, ecological, and institutional environments have different effects in different settings, and especially that policies that succeed in one setting may utterly fail in others (Acheson, 2006; Brock & Carpenter, 2007). The USDA organic certification system does not appear to fit in the context of West Virginia, given that few farmers who actually adopt organic production go on to pursue certification. Many years of research on social-ecological systems have revealed that the effects of policies designed to enhance prospects for sustainability often depend critically upon how they interact with the context in which they are implemented (Acheson, 2006; Basurto & Ostrom, 2009). The USDA certification process presents a nationwide model to encourage organic production, but in doing so its framers may be neglecting how these policies operate in varied contexts and thereby be undermining its goals. In other words, our results highlight that a one-size-fits-all approach might not necessarily fit all.

The results of our study have two primary implications for agriculture and food system professionals. First, the results indicate that, at least in the case of West Virginia farmers, the lack of perceived benefits to organic farming is as consequential as the prospect of economic returns. In other words, conventional farmers and/or potentially new or beginning farmers did not perceive enough potential benefits of farming using organic methods. This may be due to a number of reasons, but as indicated in our results the possible distribution options are likely a critical factor. Working to develop aggregation and distribution mechanisms for rural farmers is critical in order to shepherd the product to a viable market that has a critical mass for demand of organic products. Second, our results indicate a lack of overall interest by our study participants in pursuing USDA organic certification. Given the size and production of the farmers in our study compared to those certified elsewhere in the southeastern region of the U.S., size and scale of the farm does seem to matter, as small farmers appear to have less interest in and need for organic certification. If agricultural groups and agencies seek to increase the number of USDA-certified organic farms, working with farmers to increase the scale of their operation or with farmers already producing at a larger scale (that would warrant wholesale-style distribution) to transition to organic certification would likely prove most fruitful.

There are several limitations to this work. First, the sample is limited to mostly specialty crop producers in West Virginia and has no observations of USDA-certified organic farmers. Based on the 2007 USDA Agricultural Census, we expected that 70 or more organic farms would exist in West Virginia in 2012. This was a false assumption, as the current number of certified farms in West Virginia stands at five (based on the Charleston,

West Virginia, USDA field office). A third limitation of this study is in the response rate (29.2 percent). Though well within an acceptable level for mailed surveys (Brown, 2004; Farmer, Knapp, Meretsky, Chancellor, & Fischer, 2011), we feel our response rate was reduced because the USDA was conducting a survey during the same months that our phase 2 (mailed survey) collection process was occurring. Another limitation is that respondents self-selected their classification status (noncertified organic, conventional, in transition, or organic exempt) and there was no real mechanism for confirming this information without conducting on-the-farm visits.

Given our low number of respondents who classified themselves as transitioning or organic exempt, we were not able to statistically test the similarity between the two groups with each other or those classified as noncertified organic. This study's results by and large pertain to West Virginia, although the results do provide further insight into the factors that affect the decision to farm organically and to engage in the USDA organic certification process. Although we do not expect that our results are generalizable to all farms in the United States or those far from central Appalachia, we suggest that the results may be generalizable to the range of the independent variables (King, Keohane, & Verba, 2001) that are within contexts similar to those found in West Virginia.

West Virginia is not a leading producer of agricultural products, whether organic or not, and is likely overlooked when national agriculture policy and environmental policies dealing with agriculture are designed. The lack of fit between the policy and West Virginia is quite clearly demonstrated by the near absence of certified organic farms. Nevertheless, the results also show that there are many farmers using organic practices in West Virginia and that new farmers who perceive a combination of high economic benefits and lower constraints are likely to choose to farm using organic methods. Further research is needed to build upon this work, using larger datasets at the regional or national scale in order to test the usefulness of context in understanding the decision to farm organically.

Acknowledgments

Foremost, we thank the farmers who took the time to participate in the telephone interviews and complete the mailed questionnaires. This project would not have been possible without their input. We also greatly appreciate the feedback we received on the questionnaire and interview scripts from farmer Tim Alexander, Dr. Tim Woods, farmer Dominique Wong, farmer Dr. Jennifer Meta-Robinson, Dr. Jim Kotcon, Laura Hartz, Megan Grandfield, and Anne Stroud. We thank M. Koesling for sharing his scales and batteries on evaluating intention to manage farms organically, Patricia Lezotte for editing assistance, and Downstream Strategies for their partnership in the research project. We appreciate the JAFSCD reviewers and their helpful feedback that greatly improved the article. Finally, we thank the United States Department of Agriculture, National Institute of Food and Agriculture (USDA-NIFA) for financial support of this project.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Rustbelt radicalism: A decade of food systems planning in Buffalo, New York (USA)

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Submitted December 27, 2013 / Revised March 3 and April 21, 2014 / Accepted April 21, 2014 / Published online September 17, 2014

Citation: Raja, S., Picard, D., Baek, S., & Delgado, C. (2014). Rustbelt radicalism: A decade of food systems planning in Buffalo, New York (USA). *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 173–189. http://dx.doi.org/10.5304/jafscd.2014.044.015

Abstract

Pressure is increasing from nongovernmental actors to incorporate food more concretely into municipal policies and plans. A qualitative case study of Buffalo, New York (USA), demonstrates that incremental, persistent food systems practice and advocacy by nonstate actors, a group we call the "rustbelt radicals," followed by their collective engagement with municipal planning, can lead to transformations in municipal policy and planning for strengthening food systems. The paper concludes with seven factors that enable "rustbelt radicals" to transform local food systems plans and policies.

Keywords

food system planning, food planning, food policy, Massachusetts Avenue Project, rustbelt radicalism, urban planning, Buffalo, urban agriculture, zoning, land use planning, activism

Introduction

Although food is no longer a stranger to the planning field (Pothukuchi & Kaufman, 2000), municipal planning departments remain slow to address the state of food systems in their communities. In 2008, only 30 percent of respondents to a survey of the members of the American Planning Association reported that their agencies were engaged in food systems planning, and respondents whose agencies did engage in food system planning worked largely for nonprofit organizations (Raja,

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Born, Kozlowski Russell, 2008). Only a handful of municipal planning departments include food system planners on staff. Yet food system planning is very much underway in the United States, instigated largely by individuals and organizations working outside of municipal governments.

This paper documents the decade-long experiences and practices of community-based food systems actors we call "rustbelt radicals" in the post-industrial city of Buffalo, New York. Through a case study of the Massachusetts Avenue Project (a nonprofit organization that focuses on food systems and youth empowerment) we explore the practices of rustbelt radicals against a complex backdrop of municipal policies and plans that they alternately navigate and resist, and ultimately transform, in order to improve Buffalo's food system. The experiences of rustbelt radicals offer insights into the possibilities and limitations of municipal plans and policies to leverage positive changes in the food system, and offer a paradigm for incremental yet collective transformation of the food system in limited-resource communities.

Rustbelt Radicalism: Incremental, Persistent, and Networked

Despite the growing interest in planning for community food systems, only a modest body of planning literature examines the trajectory by which food emerges as a local government planning and policy issue in U.S. communities. Bedore (2012) and Cohen (2012), for example, identify factors that explain the emergence of food and urban agriculture as a public policy issue (Bedore, 2012; Cohen, 2012). Initial evidence suggests that food system planning emerges from and is led by individuals and organizations outside of local government, often in the face of non-engagement by local government planners. We draw on James C. Scott's accounts of resistance by peasants to state domination (Scott, 1990, 2013) to help interpret how the micropractices of urban food system rebuilders influence food policy in the post-industrial city of Buffalo, New York.

Like Scott's resistors, Buffalo's rustbelt radicals, located outside of the local government apparatus, have no formal policy authority. Instead, they draw their power from ordinary, incremental, and persistent practices: they engage in the ordinary act of growing food, on one abandoned urban vacant lot at a time, and transform them into gardens or farms over multiple growing seasons. Scott (2013) points to the covert resistance practices of subordinate groups (such as peasants) that include feigned ignorance (of laws), foot dragging, noncompliance, etc., that are intended to deny or mitigate claims made by superordinate groups (such as the state), or advance peasant claims vis-à-vis the superordinate group.[1] Rustbelt radicals deploy many of these practices. As highlighted in the case that follows, rustbelt radicals alternately comply with, circumvent, or oppose municipal land use policies that limit practices to rebuild food systems.

Although we draw from Scott's theoretical frame, we recognize that significant differences exist between our urban rustbelt radicals and the rural peasant resisters (and other subordinate groups) he describes. Unlike Scott's (2013) resisters, over time rustbelt radicals form advocacy coalitions with the express goal of changing policies and systems. A vast body of research points to the importance of such advocacy coalitions in public policy-making (Sabatier, 1988), including in health-related public policy (Milio, 1987), and indeed in planning (Healey, 1998).[2] Similar to other policy advocacy coalitions, rustbelt radicals engage in strategic and collaborative alliances and networks with organizations with whom they share core values (Sabatier, 1988) about the broken state of the food system. Through such coalition-building, rustbelt radicals amplify their own resources and voices within the dominant

[1] Note that although lacking the elected and bureaucratic authority of the state, rustbelt radicals bear much symbolic capital: many are educated professionals and members of a vocal not-for-profit community.

[2] Despite this vast body of research, the role of not-for-profits (such as our rustbelt radicals) in U.S. public policy formation is poorly understood (Sandfort, 2010). It is plausible that this limited understanding is a result of disparate scales: not-for-profits' practices are focused on a small geographic scale (neighborhood to city), while policy formation occurs at larger geographic scales. The role of food-focused not-for-profits is even more complex since they are working in a domain (food) that is new as a local policy issue.

policy discourse. Because rustbelt radicals come to engage in such collective advocacy action after prolonged engagement in ordinary and incremental practices to repair the food system, Scott's (2013) framework offers a useful way to understand the processes that *precede* the formal articulation and eventual development of food-aware plans and policies in post-industrial cities.

In the case that follows, we claim that two sequential characteristics of rustbelt radicalism — years of incremental, ordinary practices to rebuild food systems, followed by a surge in collective action through network- and alliance-building — have changed the dominant local government policy discourse in favor of food issues. The experiences of rustbelt radicals illustrate the possibilities as well as the limitations of municipal policy and planning in supporting positive change in the food system in post-industrial cities. The remaining paper is organized as follows. We first recount the ways in which food has been treated generally within the profession of urban and regional planning. Following this, we present the case study of how food planning has evolved in Buffalo over the last decade. We conclude by identifying seven elements that have brought food to the planning table in Buffalo.

Evolution in Urban Planning and its Treatment of Food Systems

The relationship between urban planning practice in the U.S. and food systems has evolved considerably over time. In the late 1800s and early 1900s, the City Beautiful movement swept cities like Buffalo with ideas of grandeur, aesthetic appeal, "sanitary reform, park planning, and civic art" (Donofrio, 2007, p. 30). Donofrio notes the disdain for urban food system infrastructure in the City Beautiful approach: "if the civic center was the formal embodiment of civic pride, an object lesson in art, culture, and moral values, the [food] market was an informal mass of vendors and products associated with vegetal decay, waste, and odor" (2007, p. 31). Livestock traditionally had been butchered and traded right in public markets in the heart of cities; in downtown Buffalo, the Chippewa/Washington market established in 1865 served as one such locale. The chaotic, obtrusive, and unsanitary nature of early urban food system infrastructure did not mesh well with the ideals of City Beautiful. Instead, attempts to improve conditions of cities focused on improving sanitation and reducing congestion, dirt, squalor, and the spread of infectious disease, common public health concerns of the time (Sloane, 2006).

Critics of the City Beautiful approach noted the lack of attention paid to functional necessities of urban residents. The City Scientific/Practical approach that followed presumed that planners could define problems in their communities, obtain and analyze data to assess the problems, identify the most efficient solutions to these problems, and implement the solutions with limited engagement by a largely pliant public (Friedmann, 1987). Food was not entirely absent from the minds of these technical, functionalist planners. At the first U.S. planning conference in 1909, a keynote speaker identified food supply markets as one of 12 areas in which planning experts should collect data (Donofrio, 2007). Food-related concerns were viewed through a top-down, scientific-rational lens that dominated the profession at the time. Planners focused, for example, on achieving efficiencies for transporting food within cities by establishing terminal markets (Donofrio, 2007). While the efficiency of distributing food within cities received attention, there is little evidence to suggest that planners viewed food in the context of a larger, complex politico-economic system of food production, processing, and distribution to diverse stakeholders with uneven access to power and resources.

In the early to mid-twentieth century, planners began to argue for planning at a regional scale. These regional planners acknowledged the need to include areas for food production while planning settlements. However, they too did not consider the food system in its full politico-economic complexity. Regional planning never gained a prominent foothold in the United States — nor did the idea that communities' food infrastructure should be a matter of concern for planners.

In the post–World War II era, two parallel trends in development patterns and the food industry further ensured the separation of food concerns from planning, and indeed, from society.

First, suburbanization of the American landscape physically distanced consumers, farmers, food processors, and others involved in the food trade, rendering the notion of a linked and spatial food system irrelevant. Second, significant advances in food technologies used to process and package foods resulted in the production and widespread prevalence of food *products* that bore little resemblance to their source plant or animal, rendering food's origins — and indeed the entire system that moved food from farm to table — nearly invisible. Prescient about these transformations, in 1961 Lewis Mumford wrote:

> The town housewife, who half a century ago knew her butcher, her grocer, her dairyman, her various other local tradesmen, as individual persons, with histories and biographies that impinged upon her own, in a daily interchange, now has the benefit of a single weekly expedition to an impersonal supermarket. (Mumford, 1961, p. 623)

Food, or at least its production, did receive attention from two subsets of planners. Rural planners recognized and worked to reduce the loss of farmland in peri-urban and rural areas, and antisprawl planners pointed to the loss of farmland as a reason to thwart sprawl. Still, this vast body of planning scholarship on farmland preservation overlooked larger structural failures within the food system — consolidation within the food industry, shift in market preferences, increasing globalization, etc. — that partially explained the decline of farmland. Moreover, among this subset of planners food was largely viewed as a rural issue, and food systems continued to remain absent from the *urban* planning agenda (Pothukuchi & Kaufman, 1999).

In the middle of the twentieth century, urban planning's failure to deliver technical solutions to communities' problems became even more apparent. The social and political turmoil of the 1960s popularized the notion of advocacy planning (Davidoff, 1965). Advocacy planning fueled many in the profession to take normative stances on behalf of the underprivileged (Heskin, 1980). Food-related concerns were very much on the public's agenda, particularly given concerns raised about the harmful effects of pesticide use in food production on low-income consumers and farmworkers by the environmental justice and organic agriculture movements (Caton Campbell, 2004). However, the mainstream planning practice was largely food-blind.[3]

Influenced by the writings of German philosopher Jürgen Habermas, the subsequent communicative turn in planning theory discourse emphasized the role of planners as communicators and facilitators (Forester, 1980). This shift occurred in the 1980s, when power distribution among stakeholders in the U.S. food system became increasingly uneven. Local farmers and consumers became increasingly disempowered while food processors and distributors gained, partly through consolidation, a growing share of the global food industry. Here was an opportunity for communicative planners to mediate tensions and facilitate connections across food system stakeholders (Caton Campbell, 2004), yet the era of communicative planning brought no greater attention to discrepancies and conflicts in the food system. Friedmann's (1987) criticism of Habermasian communicative planning philosophy that it is "suggestive of a radical transformation of society" but ultimately implies "no political planning practice whatever," appears to have held true in communicative planners' non-engagement with the food system (Friedmann, 1987, p. 267).

It was not until the start of the twenty-first century that planning scholars began to address problems in food systems. In a series of articles, Pothukuchi and Kaufman criticized the state of the

[3] One notable departure in the field of planning was a 1977 report prepared by planning students at the University of Tennessee's Graduate School of Planning, which documents failures in the local food system (Blakey et al., 1977). Although the report was prepared outside the confines of a government agency, it called for and subsequently catalyzed the creation of the Knoxville Food Policy Council (FPC) in 1981, one of the earliest known food policy councils in the country. The Knoxville FPC continues to function today, and decades after its creation food policy councils are emerging throughout the United States as effective institutions for shepherding communities through the crises of malfunctioning food systems.

U.S. food system, arguing that food must become central to planners' responsibilities (Pothukuchi & Kaufman, 2000). They mapped multiple ways in which municipal planning affects and is affected by the food system (Pothukuchi & Kaufman, 1999). Since these writings, considerable shifts have occurred in the planning discipline. In 2007, the American Planning Association (APA) issued formal guidance to its members on including food planning as an element of local and regional planning (APA, 2007), and a growing number of local governments across the U.S. have adopted official plans to guide their communities' food systems to healthier futures (Neuner, Kelly, & Raja, 2011). Today, planning scholars in more traditional areas of planning such as growth management are taking note of the importance of food systems (Chapin, 2012), and, likewise, journals focused on food are exploring the possibilities and pitfalls of having planners engaged in food systems. Indeed, in 2011, the *Journal of Agriculture, Food Systems, and Community Development* published a special issue on planning for food systems that covered a wide array of topics ranging from development of new planning definitions, measures, and tools (Freedgood, Pierce-Quiñonez, & Meter, 2011) to planning for new food infrastructure such as food hubs (Horst, Ringstrom, Tyman, Ward, Werner, & Born, 2011). This reemerging interest by planners in rebuilding food systems gives us reason for both enthusiasm and pause. To the degree that planning practitioners reflectively engage with community-led practices of rebuilding food systems (such as those of rustbelt radicals), the profession can facilitate transformation in food systems and communities; conversely, lack of reflective engagement can stultify innovation in rebuilding food systems *even when* food is on the planning table.

Research Design, Methods, and Data Sources

This paper documents and analyzes on-the-ground food systems planning practice through a case study of Buffalo, New York, focusing on the work of two key actors: a nonprofit organization (Massachusetts Avenue Project) and the municipal government. The case study spans events and policies adopted over the last decade, roughly 2002 to 2013. Our selection of this time period for the case study does not imply that no food systems initiatives existed in Buffalo prior to 2002. Instead, the decade is the period over which the co-authors engaged in a community-university partnership to observe and attempt to transform the city's food system. Mirroring trends in other rustbelt cities, this decade is one of tremendous action and evolution in food systems planning practice in Buffalo.

The empirical component of the case study uses a mixed-methods approach, relying on multiple sources of mostly qualitative data. These analyses include a critical review of draft and adopted local government plans and ordinances, transcripts of two unstructured interviews with a local planning official and a city policy-maker, and 10 years of participant observations by authors (one of the co-authors is a rustbelt radical who works for the organization that is under discussion in this paper; the lead author has observed the work of this organization for 10 years in multiple community meetings as well as on its program site, including observing its work with youth through site visits every summer for the last decade).

Several challenges arise in such qualitative work. First, how does one ensure that the account is a *credible* representation of the rustbelt radicals' experience? Second, how does one ensure that the account represents a *balanced* representation of the overall experience in Buffalo — and is not partial to rustbelt radicals' experiences? To address the first concern — whether the observations in this manuscript were a *credible* representation of the experience of the rustbelt radicals — the lead author requested one of the rustbelt radicals to review and comment on this manuscript (and because this is largely a story of her work she is acknowledged as a co-author). Precedent for a *subject* to have voice in qualitative research exists in the literature (Duneier, 1999). In the event that the lead author and the rustbelt radical (co-author) disagreed, the lead author retained editorial control.

To address the second concern — whether the manuscript offered a *balanced* view — the lead author shared the case study with a city planner and the lead staff member of an appointed official to verify confirmability of the narrative (Trochim, 2001), both of whom were interviewed by the lead

author. Any divergence in the views of the rustbelt radicals, city planners, and representatives of elected officials was noted by the lead author in the manuscript. Data collection through interviews for this case study was approved by the Institutional Review Board (IRB) of the lead author's university. The paper also uses basic quantitative and spatial methods of analysis using geographic information systems (GIS) to describe the demographic and land use conditions; data for these supplementary analyses are from the U.S. Census and Erie County land parcel data, respectively.

Case Study: As Goes the Food System, So Goes Buffalo

The fortunes of Buffalo, New York (NY), are intricately linked with those of the local and global food system. The opening of the Erie Canal in 1825 enabled the transportation of grain from the Midwest to the Eastern Seaboard via Buffalo, the western terminus of the canal. With the invention of the first steam-powered grain elevator in Buffalo in 1843, grain was stored and transported with unprecedented efficiency. Murray notes that "by the 1920's, [grain] passed through Buffalo at a rate of more than three hundred million bushels a year, [enough] to make bread to feed today's Americans for about two years" (Murray, 2007, p. 201). Science and technology modernized food system infrastructure and propelled Buffalo into a prominent position in the national and global food system and economy. But as the canal became a less significant route for transportation of grain and a broad shift from manufacturing to service-based industries occurred, Buffalo lost its prominence in the nation's food system and economy.

Once home to a half million people, Buffalo's 2010 population was 261,310 (U.S. Census Bureau, n.d.a). Vacant land is plentiful: recent estimates indicate that about 15,058 out of 94,856 (15.9 percent) land parcels are vacant.[4] Poverty and unemployment are high: 30 percent (±1.2 margin of error) of city residents earn income less than the federal poverty line (U.S. Census Bureau, n.d.a). Food insecurity, not surprisingly, follows suit: about a quarter of the city's households and about 46.6 percent (±1.9 margin of error) of households with children rely on public food assistance to meet their food needs (U.S. Census Bureau, n.d.b). The food retail environment is dominated by restaurants, and supermarkets redline low-income neighborhoods (Raja, Ma, & Yadav, 2008), seriously affecting the area's incidence of diet-related diseases (Raja et al., 2010).

Buffalo's rustbelt radicals, and in particular the representatives of the Massachusetts Avenue Project and its allies, are aiming to rebuild a socially, economically, and spatially fractured food system from the ground up. Today, about 60 community gardens and a handful of urban farms dot the city (Grassroots Gardens of Buffalo, n.d.), converting blighted vacant urban land to productive use; an aquaponics project raises fish for sale in an underserved low-income neighborhood; a mobile market transports fresh produce to underserved neighborhoods; food truck vendors are seeing a resurgence; and food supply chains are shortening and localizing, capturing greater returns from economic activity within the region. These and other incremental transformations tighten a disjointed food system and facilitate a public policy dialogue about the state of the local food system.

From Food Projects to Food Planning: Evolution of Massachusetts Avenue Project

Massachusetts Avenue, a street on Buffalo's West Side, is dotted with vacant lots and abandoned houses. Noting the limited safe spaces for local youth, a group of residents from the area organized in 1992 to construct a playground. After completion of the playground in 1994, the group and its allies planned to open a neighborhood center. In early 1998 the Massachusetts Avenue Project (MAP) neighborhood center opened in a city-owned building that had previously housed a food pantry, and the first paid staff person was hired. Two years later MAP incorporated as a nonprofit corporation.[5]

[4] GIS analysis of 2010 land parcel layer of the city of Buffalo.

[5] An arson event in 2005 forced MAP to relocate to new premises on an adjacent street, in a vacant public building that previously housed a public library. In a pleasant twist of fate, MAP and collaborating nonprofits advocated that the arsonist, a youth from the neighborhood, receive restorative justice

MAP's arrival in the former food pantry space foreshadowed a shift in the neighborhood's microcosmic food system. Across the street from its neighborhood center, MAP staff started gardening with support from local residents on two city-owned lots. Grassroots Gardens of Buffalo (GGB), another nonprofit organization, provided insurance to protect against liability. MAP signed a five-year lease with the city to use the vacant public land for its gardens for one dollar per year; this agreement was reminiscent of temporary land arrangements in other rustbelt cities as residents sought ways to address the co-existing problems of high vacancy and high poverty. New community garden projects were also being planned by other nonprofit organizations on city-owned properties bordering MAP's community garden. These initiatives stalled after the first year and MAP was offered the opportunity to take over the lease on five additional city-owned vacant lots. Eventually, MAP purchased eight lots from the city, and the community garden grew into the first urban farming project in Buffalo.[6]

In 2003, MAP launched Growing Green, a comprehensive program to address high rates of youth unemployment, land vacancy, and food insecurity in the 10-block area around MAP's neighborhood center in order to achieve its goals of broader social justice and youth empowerment. The same year MAP commissioned a neighborhood food system assessment and plan to inform its work (Almeida et al., 2003).

Through the Growing Green Program, MAP is working to change the city's food system by creating a sustainable and economically viable model of urban agriculture, providing economic opportunities for young people in the local food system and organizing young people and adults to advocate for land use and food policy that meet community members' needs. Since 2003, MAP has employed and trained over 450 low-income youth, ages 14 to 20.[7] MAP staff partner with young people, employing four main practices:

1. Urban Farming: Teaching and demonstrating sustainable food production techniques to youth through urban farming and aquaponics.
2. Food Distribution and Enterprise Development: Distributing healthful, affordable produce through a farm stand and a mobile market; and developing and running Growing Green Works, a youth-run business specializing in locally made, value-added food products.
3. Community Education and Training: Providing urban agriculture and food systems training, technical assistance, farm tours, and field trips to community members, schools, and other organizations.
4. Advocacy and Policy: Engaging youth and community members to promote municipal policies for healthier neighborhoods and greater food security.

MAP staff members view food not only as nourishment but also as a starting point for education, community building, and economic growth. They note that youth from low-income communities rarely have an opportunity to learn or experience the importance of civic engagement, or to recognize their own value and power to make positive change. MAP organizes youth and other residents to voice their concerns and raise their awareness of healthier neighborhood food environments by introducing new opportunities and spaces for producing, processing, distributing, and marketing healthful foods. Intrinsic to MAP's work with youth is nurturing their understanding of themselves as individuals and community members. Youth are challenged to think about how they see others in relation to themselves and to identify the rights and responsibilities they have in their community. Youth discuss and debate issues

rather than be prosecuted for his crime. Subsequently a partner organization, People United for Sustainable Housing (PUSH), trained him in building rehabilitation; the individual has since contributed to rebuilding affordable green housing in the neighborhood.

[6] MAP also grows produce on four additional lots owned by PUSH.

[7] Incidentally, only about 50 percent of Buffalo's high school students graduate on time, while about 90 percent of high school students participating in Growing Green graduate on time.

of oppression, power, scarcity, and control of resources, and are challenged to think about the power they have both as young men and women, and as producers and eaters in the food system. Youth use their talents, interests, and strengths to make change and advocate for policy change.

In recent years, MAP has begun to combine its direct practices to strengthen the local food system through farming and food distribution with more indirect, somewhat longer-term efforts to change larger policy structures like plans and ordinances that hinder the creation of a healthier food system in Buffalo. In 2005, MAP began conversations with representatives of a local medical campus and other partners to tackle healthy eating policy citywide. Subsequently, in 2009 the stakeholders (including a local medical campus, several public, nonprofit, and private partners, and a local university) , with financial support from the Robert Wood Johnson Foundation, launched Healthy Kids, Healthy Communities-Buffalo (HKHC-Buffalo), a partnership intended to transform policies and environments to promote healthy eating and active living in Buffalo. The partnership provided a platform for individual organizations to seek policy change to support their individual organizations' programmatic work. Through HKHC-Buffalo, MAP staff and youth are engaged in policy-focused efforts to improve children's access to healthy foods in multiple ways. Staff and youth serve on the steering committee of the HKHC-Buffalo partnership, enriching its perspective with their on-the-ground experience. In partnership with a local university, MAP youth designed and conducted neighborhood audits of food retail stores; findings from these audits were distributed to policy-makers by the HKHC-Buffalo partnership.

MAP staff works closely with city lawmakers, especially, with city council member David Rivera, within whose West Side district MAP's farm lies, to advocate for policy change. In 2010, with advocacy from rustbelt radicals, Rivera and his staffers developed and successfully oversaw the passage of an ordinance to permit the raising of chickens, following public outcry over an animal control officer threatening to remove a resident's chickens. Rivera, who has emerged as a champion of community food systems and considers MAP a "pioneer," notes that he supports food systems work because "community stakeholders have made their case [for food]" (personal communication with D. Rivera, March 13, 2013). As part of this effort to make the case for food policy in Buffalo, in 2010, MAP and its allies in the HKHC-Buffalo partnership co-organized the first Buffalo Food Policy Summit to bring food to the attention of local policy-makers and officials. The summit, which was opened by the city's mayor, was well attended by the city's law-makers and officials.

Signaling a growing support for food policy in the city council, in 2012 two additional council members, Darius Pridgen and Michael Locurto, joined Rivera in sponsoring and successfully advocating for the passage of a resolution to establish a steering committee charged with developing the structure for a food policy council (FPC). The steering committee proposed the creation of a city-county FPC (the Buffalo-Erie Food Policy Council), and sought legal recognition from the county legislature and the city council. In May 2013, the county legislature passed a law recognizing the FPC as an advisory body under the Erie County's Board of Health.

Most salient to planning, MAP and HKHC-Buffalo partners have begun to bring food system–related concerns to the city's land use planning process (described in the next section). A timeline of a selected number of MAP's activities focused on planning and policy development is shown in italics in Table 1. MAP is motivated to engage in the policy development landscape for a variety of reasons. Engaging in policy development reduces risk and unpredictability for its day-to-day program operations. The lack of recognition of urban agriculture in the current zoning code and land use plan, for example, causes urban agriculture to be viewed as a transitional or impermanent land use. MAP also views engagement in policy development and planning as an opportunity for civic education, challenging the status quo that hinders the creation of healthier neighborhoods, and raising public recognition of food as an economic driver and community development tool. MAP's evolution from focusing on incremental practices to rebuild the food system — which they continue — to broader engagement in advocacy and policy

Table 1. Selected Milestones in Radical Food Systems Planning in Buffalo

Massachusetts Avenue Project	Year	Municipal Government	
A coalition of residents organize on Massachusetts Avenue	**1992**		Food-blind planning
Massachusetts Avenue Project incorporated	**2000**		
Food for Growth plan published; Growing Green launched	**2003**		
USDA grant awarded			
MAP starts selling food in the neighborhood at its farm stand	**2004**		
Growing Green Youth Enterprise launched	**2005**		
	2006	City of Buffalo adopts Comprehensive Plan	
Aquaponics project piloted in the county's first straw-bale greenhouse	**2007**		Cautious engagement in the food system
Mobile market pilot launched			
MAP staff appointed to Community Gardens Advisory task force	**2008**	Common Council appoints Community Gardens Advisory Committee; Committee commissions local university to complete Queen City Gardens Plan	
		Community Garden report Resolution Number 137 adopted in support of community gardens as vacant land reuse strategy	
Healthy Kids Healthy Communities-Buffalo (HKHC-Buffalo) partnership formed, with MAP as a key partner	**2009**		
MAP builds a hoop house and commercial aquaponics facility	**2010**	City signs a lease with a new urban farm on public land	
		Common Council passes resolution supporting community gardens	
MAP and allies advocate for the development of a chicken ordinance; raise chickens on its farm		Common Council adopts an ordinance allowing raising of chickens in the city	
MAP and allies convene the first Buffalo Food Policy Summit	**2011**	Mayor and local university president inaugurate the first Food Policy Summit	
MAP participates as a key stakeholder in the Green Code process		Mayor's office and Office of Strategic Planning launch the "Green Code" process	
MAP builds capacity of youth to participate in the Green Code process			
MAP youth participate in creation of a Youth Food Bill of Rights at Rooted in Community Conference			
HKHC-Buffalo partners publish assessment of local plans and regulations affecting the food system	**2012**	Common Council adopts a resolution to establish a steering committee to develop guidelines for a Food Policy Council	
MAP youth and staff speaks before U.S. Congressional committee about importance of community food system development		City adopts ordinance supporting mobile food trucks	
MAP advocates for and Executive Director serves as a member of the Buffalo-Erie Food Policy Council steering committee		Green Code draft explicitly supports urban food production and aims to provides regulatory clarity	
	2013	Buffalo-Erie Food Policy Council established	

development has led to their emergence as de facto, if covert (Beard, 2002), food systems planning practitioners in Buffalo.

Municipal Food Systems Policy and Planning in Buffalo: From Food-blind to Cautious Engagement

2000–2006: Food-blind Planning

MAP's efforts to rebuild the city's food system are intertwined with an evolving municipal planning stance toward the food system (see timeline in Table 1). A guidepost to understanding this stance is the city's official comprehensive plan, which describes a vision for Buffalo's future and outlines guidance for future regulatory, development, and public investment choices (City of Buffalo, 2006). Adopted in 2006, the comprehensive plan ambitiously aims to transform Buffalo into "a prosperous, green regional center providing livable communities for all its citizens" (City of Buffalo, 2006, p. 1). The plan's guiding principles call for sustainable development that integrates economic, environmental, and social concerns, and preserves opportunities for future generations to live a good life. Drawing on these principles, the plan outlines seven overarching policies to guide future investments: (1) deliver quality public services; (2) maintain public infrastructure; (3) transform the city's economy; (4) reconstruct schools; (5) rebuild neighborhoods; (6) restore the waterfront; and (7) protect and restore the urban fabric.

These guiding principles or policies make no explicit mention of the city's food system. In the main body of this otherwise visionary and award-winning plan, food plays a minor role. The word "food" itself appears four times in its 134 pages. Three of these four references associate food with economic activity: food processing is identified as one of several new "economic sectors [that] have grown to provide new jobs to replace the old" (City of Buffalo, 2006, p. 10, and food processing is described as having provided some of the greatest gains in local and regional employment in the 1990–1999 decade. These references hint at the "big fix" economic development discourse that has dominated Buffalo's local government policy in recent history. The only non-economic reference to food appears when the narrative of the plan argues for the importance of protecting the waters of nearby Lake Erie for food production (among other reasons). Yet these minor references define the food system only in instrumental terms to support more traditional planning goals like economic development. Improving the food system for its own sake was neither an explicit nor implicit goal in the 2006 comprehensive plan. As a consequence, the proposed policy, program, and detailed investment recommendations of the plan offer no support for the food infrastructure of the city, which is essential to the ordinary, daily lived experiences of people that make cities desirable (Jacobs, 1961). This food-blind comprehensive plan of Buffalo reflects the prevalent view of mainstream planning practice toward food system concerns at the time.

It is important to note, however, that although the comprehensive plan offered no explicit guidance on how to strengthen the food system, planners were at this time, in fact, engaged in one component of the system: food retail. Specifically, the city government was actively involved in attracting supermarkets to the east side of Buffalo, an underserved neighborhood (personal communication with city planner, March 13, 2013). This effort is similar to attempts by municipalities nationwide to attract food retail to underserved city neighborhoods (Pothukuchi, 2005).

2006–2013: Cautious Engagement with the Food System

In the earlier part of the decade, municipal planning in Buffalo and MAP's practices of rebuilding the city's food system occurred largely without explicit mutual engagement. However, this distance was bridged rapidly and intensely between 2006 and 2012, in part due to the creation of the formal HKHC-Buffalo partnership in 2009. Its coordinator reached out regularly to city officials and policymakers. City planners — at least those interviewed for this paper — appear to respond to rustbelt radicals reflectively (Schön, 1983). When the mayor announced in 2010 that the city would revise its 30-year old land use plan and 60-year old zoning code to bring them in compliance with the 2006 comprehensive plan, an initiative the city labeled the "Green Code" process, city planners invited

HKHC-Buffalo and MAP to join the planning process. A MAP designee served on the Green Code Citizen Advisory Committee established to provide feedback on drafts of the plan and zoning code and assist with public outreach. Since the launch of the Green Code, the planning department has held more than 30 public meetings and engaged nearly 400 city residents in the process (personal communication with city planner, March 13, 2013).

Rustbelt radicals responded to the city's invitation to engage in the Green Code process actively. In partnership with the city, the HKHC-Buffalo coordinator and MAP staff and youth designed and conducted trainings on land use planning and zoning for residents, building residents' capacity to participate and draw attention to food-related concerns in the planning process. Indeed, food concerns emerged as a prominent planning issue through the Green Code community engagement process (personal communication with city planner, March 13, 2013). When queried during an interview about the role of local governments in building food systems, a senior city planner noted the following:

> In Buffalo, we do have concerns [about food]…we have heard it in [the] feedback we have had from the Green Code…People understand they are living in a food desert. We want to have zoning that is flexible enough to try to accommodate those needs… recognizing uses like community gardens, market gardens, market stands, open air gardens, aquaponics facilities, composting facilities, some accessory uses…providing legal clarity for those uses…it's something that we are doing through the Green Code. … For corner stores, we don't tackle food directly but any retail that is within a neighborhood residential area we are allowing things to be approved only on condition at corners. It provides the community an opportunity to weigh in to decide if that use is appropriate. (Personal communication with city planner, March 13, 2013)

City planners' reflective response to residents' and rustbelt radicals' concern is also discernible in the latest planning guidance from the city, a draft land use plan, *Buffalo 2012–2032—Future Land Use Plan,* released in 2011 (City of Buffalo, 2011), and a preview of the zoning code, released in November 2012. Unlike the 2006 comprehensive plan, the recent draft land use plan and zoning code address components of the food system, a marked departure from the past. Text from the draft land use plan, which opens with the aspirations of the community advisory committee, outlines three principles to guide future action: "economy," "neighborhoods," and "environment" — and food-related concerns make an explicit appearance in all three sections (see Table 2).

The draft land use plan acknowledges concerns about the food system, albeit with caution. In nearly each allowance made for the health of the food system, the policies define limiting standards for community practices such as urban growing (see italic text, Table 2). The draft policy also continues its preoccupation with economic development. For example, although vacant land will be made available for urban agriculture and community gardening in areas of the city that are vacant, the possibility of future redevelopment will remain open.

Reflecting the planning approach prevalent across the country, Buffalo's draft land use plan focuses narrowly on food production and does not address other sectors of the food system. There remains limited recognition that, like a well-functioning city (Jacobs, 1961), a well-functioning food system comprises a multitude of practices including processing, aggregation, distribution of food, and reduction and reclamation of food-related waste.

The draft zoning code, which is still under preparation and will implement the broad guidance of the land use plan through precise regulations, includes several land use definitions in support of urban food production, indicating an improvement in the public policy stance toward food since the earlier part of the decade. For example, urban agriculture activities are proposed as a permissible use in most zones, while they are not mentioned in the current code. Structures essential for urban agriculture, such as apiaries, chicken coops, greenhouses, market gardens, and farm stands, are

Table 2. Extract of Draft Land Use Plan (italic added to illustrate restrictive standards)

Opening		"Promote land use and transportation patterns that encourage compact development and promote a full array of transportation choices to help us conserve energy, protect the quality of air, water, and soil, preserve and expand our 'green infrastructure,' and support access to wholesome food, promoting healthy living for all citizens." (p. 3)
		"Residents lack ready access to healthy food or the mobility to take part in the broader economy." (p. 8)
Neighborhood		Preamble: "Where areas are predominantly vacant, the plan will allow transitional uses such as community gardening … or urban agriculture, while *keeping open longer-term options for redevelopment.*" (p. 34)
	Principle 6.5	"Establish *interim* uses for vacant land." (p. 34)
		"Permit the development of community gardens on public lands, *with landscaping and beautification standards that ensure community benefit*" (p. 34)
		"Allow pilot projects for aesthetically pleasing…municipal orchards and urban agriculture within high-vacancy blocks *to reduce city maintenance expenditures*" (p. 34)
Environment	Principle 9.2	"Enable healthy food production and distribution" (p.40)
		"Remove barriers to developing grocery stores, healthy corner stores, outdoor markets, and farmer's stands at convenient locations throughout the city while *preventing vendors from selling individual items and stolen property*" (p.40)
		"Allow small-scale urban agriculture with *appropriate guidelines on the design of greenhouses, hoop houses, and the like*" (p.40)
		"Allow urban agriculture in high-vacancy neighborhoods as a long-term use, *with guidelines for quality design and strict standards governing safety and aesthetics*" (p.40)
		"Allow produce sales as a temporary use with *appropriate limitations on location, size, and time of operation*" (p. 40)

allowed as accessory structures. However, the final treatment of the food system in the land use plan and zoning regulations as adopted remains to be seen.

Challenges to Development of Food-Sensitive Plans and Policy

Despite the gains outlined above, Buffalo continues to confront many challenges in strengthening its food systems through planning and public policy. From the perspective of the municipal government, food concerns compare poorly within the dominant public policy discourse of economic growth and development.

A second, more worrisome, challenge is tied to the eventual success of food-policy development. Once codified, regulations and ordinances are notoriously static (as evident in the zoning code currently in force in Buffalo, which is almost 50 years old) and closed to new ways in which the food systems may innovate in the future. Indeed, once food is no longer a stranger to planning professionals (Pothukuchi & Kaufman, 2000), informal, "under-the-radar," and potentially innovative practices of rebuilding of the food system may slow down.

Finally, rustbelt radicals, too, face challenges due to limited financial resources. If they expend time by participating in planning and policy development processes, this also imposes a significant burden. To implement food systems plans, local governments must not only partner with rustbelt radicals but also fund food-related work. In looking for models around the country, we see that public financing of such work has come in the form of infusion of public funds through loans, grants (Madison, Wisconsin; Milwaukee, Wisconsin), levies (Seattle, Washington), and gap financing through economic development funds (Birmingham, Alabama), and/or through reduction of expenditures such as permitting and licensing fees (Cleveland, Ohio; Kansas City, Missouri), sales taxes (New York City), and reduction in water impact fee (Austin, Texas) (Neuner et al., 2011).

Seven Elements of Rustbelt Radicalism

As described in the preceding case, rustbelt radicals' engagement with municipal policy develop-

ment is strategic and has varied over the years. As appropriate, they circumvent, challenge, or advocate for alteration of municipal policies that affect their food systems practice. For example, MAP composts food waste on its land lots, although large-scale composting is not an explicitly permitted land use. In some circumstances rustbelt radicals navigate vague policies with flexibility and creativity. For example, because of the lack of regulatory clarity about whether produce grown on publicly owned land can be sold in Buffalo, MAP chose to situate its farm stand on a land parcel they own, rather than on a city-owned parcel, although the farmed parcels are adjacent to each other. Rustbelt radicals also engage in incremental, deliberative practices that push regulatory limits. Such practices are reminiscent of Scott's (2013) reporting of peasant resistance to state domination, which is not accompanied by mass protests or political upheaval but by incremental practices of resistance.

Rustbelt radicalism departs from other radical traditions as well as from traditions of outright passive resistance (Scott, 1990, 2013) by reflecting a certain amount of pragmatism. Unlike other radical traditions, rustbelt radicals are willing to engage the existing policy structures. They focus on building capacity of policy-makers, planners, and others in city government to understand and reform food policy in the interest of ordinary residents (rather than, for example, in the interest of industrialized food corporations). Unlike Scott's passive resisters, rustbelt radicals eventually seek collective action to transform systems and structures. Much like the post-industrial cities it emanates from, rustbelt radicalism is pragmatic in the face of power.

The shift in municipal perspective in Buffalo — from food-blind policy to cautious engagement in food systems — is a result of rustbelt radicals' varied forms of engagement with the city government that varied from oppositional to collaborative. Once part of a coalition, rustbelt radicals participate in working groups, respond to draft plans and ordinances (such as during the Green Code process), and engage in advocacy and outreach work to build residents' capacity to engage in food systems. This success is due in part to the presence of behind-the-scenes technical support provided by the coordinator and funders of the HKHC-Buffalo partnership, who continually strategized and shared insights with the rustbelt radicals.[8]

The transformation of food systems in rustbelt cities, and of the cities themselves, cannot occur without deep engagement of their citizens and the support of local governments and their planners. Such transformation requires a pragmatic practice that engages both rustbelt radicals as well as reflective planning professionals (Schön, 1983) within municipal government. As James Holston (1999) writes:

> Planning needs to engage not only the development of insurgent forms of the social but also the resources of the state to define, and occasionally impose, a more encompassing conception of right than is sometimes possible to find at the local level.…Above all, planning needs to encourage a complementary antagonism between these two engagements. It needs to operate simultaneously in two theaters, so to speak, maintain a productive tension between the apparatus of state-directed futures and the investigation of the insurgent forms of the social embedded in the present. (Holston, 1999, p. 172

Indeed, such complementary antagonism between the state-directed but reflective practice of planning and the practices of rustbelt radicals, such as in the Green Code process, explains the emergence of food systems planning in Buffalo over the last decade. Buffalo's experience with rustbelt radicalism points to seven factors that led to a discernible shift in planning and policy perspective toward food. We outline these below.

1. *Ordinary, Incremental, Persistent Practices Precede Policy*

The work of rebuilding the food system is not a new, "hot" concept in Buffalo, but rather the result

[8] The HKHC-Buffalo partnership was one of several partnerships funded across the country. Participation in this national network also increased the rustbelt radicals' capacity to engage in food systems planning and policy by increasing their access to information and lessons from a much broader network.

of years of incremental, persistent, and somewhat resistant practices (Scott, 2013) by multiple non-state food systems actors, including MAP. Rustbelt radicals have decades of experience in rebuilding food systems that existed *prior* to the municipal government even recognizing food systems as a consideration for public policy. As a result, current discussions regarding food policy are enriched by the experiences of community groups who have been rebuilding Buffalo's food systems for years. In other words, food *policy* in Buffalo has followed on-the-ground food *practices*.

2. A Diverse Yet Unified Coalition Supports Food
Experiences of other communities point to coalitions and collaborations as essential to incorporating food into plan-making (Desjardins, Lubczynski, & Xuereb, 2011) . Working alone, rustbelt radicals also have a modest policy reach. Buffalo's rustbelt radicals attribute their successes to their participation in a diverse yet unified coalition of organizations (especially the HKHC-Buffalo partnership). Rustbelt radicals' networks cross disciplinary lines (planning, agriculture, environment, and public health), age lines (youth and seniors), food system sectors (farmers, residents, local government, etc.), and geographic lines (urban and rural farmers). Despite its diversity, the network is a fairly unified coalition in terms of its shared vision of an improved citywide food system. Without such unified yet diverse coalitions, food movements may find the long-term engagement that is required for systemic and policy change to be challenging. Such networks also make it easier for municipal governments to engage multiple food advocates through a unified coalition.

3. Incremental Changes Are Balanced with Systemic Changes
Rustbelt radicals balance incremental change with systemic change. They may establish an urban farm on a vacant lot (incremental change) — but they also engage in long-term efforts to change the land use code (systemic change). While the pressure from rustbelt radicals to facilitate public policy change varies in intensity, from opposition to soft diplomacy, its key hallmark is dogged persistence. Such pragmatic radicalism offers an approach for dealing with the immediate consequences of a broken food system as well as ensuring forward movement in its rebuilding.

4. Communitywide Capacity Is Nurtured
Buffalo's rustbelt radicals engage in capacity-building activities to build a broader network that can participate in, and sustain, the effort to rebuild the city's food system. This capacity-building work has focused on incremental practices and policy change. For example, MAP regularly offers training in urban agriculture to residents. In the policy arena, MAP and HKHC-Buffalo also conduct trainings for city youth and residents on *how* to effectively participate in the Green Code process. HKHC-Buffalo partners also facilitate participation of city staff and policy-makers at food-focused conferences and workshops so they can better understand the role of food in planning. The failure to build and sustain such communitywide capacity is often a challenge for radical reform (Kraushaar, 1988), particularly in resource-strapped cities like Buffalo.

5. Response to (Policy) Windows of Opportunity Is Nimble
Rustbelt radicals make strategic use of windows of opportunity within the policy process, a strategy also used by groups in other U.S. cities (Cohen, 2012). In Buffalo, the Green Code provided such a policy window for food organizations even though land use planning and zoning is not the bailiwick of these organizations. With the launch of the Green Code process in Buffalo, MAP and its allies, through the HKHC-Buffalo partnership, moved rapidly to engage in the Green Code planning process to bring food to the proverbial planning table even though engaging in this process was not a mission of the coalition at its inception.

6. Support Comes from Within the Local Government
For transformation of food systems policy, leadership from reflective practitioners within the local government (Kraushaar, 1988) is crucial. Local governments provide the civic and democratic processes through which residents can participate in shaping the policies that affect food systems (and local governments, unlike other sectors of

society, are accountable and answerable to the public at large). In Buffalo, such leadership from within the government also came from city lawmakers who have sponsored multiple food-related policies (shown in Table 1). Staff of the planning department, too, responded reflectively (Schön, 1983) to rustbelt radicals' concerns by incorporating food concerns within the draft land use plan and zoning code during the Green Code process. Of course, engagement of local governments is not a one-time occurrence; for food policy to be relevant planners and rustbelt radicals must be continually engaged with each other.

7. *Food Is Connected to the Dominant Policy Discourse*

Cognizant that food is but one policy issue confronting the city of Buffalo, rustbelt radicals seek common ground between food and dominant public policy issues — a strategy masterfully deployed, and now advocated by, former Toronto food policy director Dr. Wayne Roberts. At the moment, the "public transcript" (Scott, 1990) of local government policy discourse in Buffalo is focused on economic development. Responding strategically, rustbelt radicals and its allies (HKHC-Buffalo) also chose "food as economic development" as the theme of the first Buffalo Food Policy Summit — participating in the dominant discourse on their own terms. The summit was well attended by lawmakers and laid the groundwork for food policy. Such remapping of food onto other policy issues is an important strategy for food coalitions to participate in public policy discourse.

Conclusion

Buffalo's experience points to a radical yet pragmatic model for food systems planning practice. Through years of engagement in incremental and ordinary practices, rustbelt radicals rebuild urban food systems. Supplementing such practices with collective action to engage in the local government policy landscape at a strategic time, Buffalo's rustbelt radicals have brought food to the policy table. Local governments, too, play a role in this transformation. Reflective planners and policymakers (Schön, 1983) within local government assist and engage with the resources, energy, and knowledge of rustbelt radicals. Such concomitant engagement of rustbelt radicals and reflective local government planners may provide the groundwork for planning and building resilient food systems in post-industrial cities.

To be sure, as competition over currently undervalued public resources, such as vacant public lands, grows in rustbelt cities such as Buffalo, the current, somewhat pragmatic, approach of rustbelt radicals may no longer be effective in changing public policy as stakes will be higher. Finally, as local government food policy shifts from being "food blind" to becoming "codified" rustbelt radicals may find themselves constrained in new ways. That, however, is a subject for another paper.

Acknowledgments

The authors thank Donna Banach, John Fell, Duncan Hilchey, Christopher Lee, Jeanne Leccese, Sean Mulligan, Alfred Price, David Rivera, Jennifer Whittaker, and three anonymous reviewers for insightful comments. The authors acknowledge the support of the Buffalo Niagara Medical Campus, Inc., Healthy Kids, Healthy Communities–Buffalo, Massachusetts Avenue Project, and the University at Buffalo Food Systems Planning and Healthy Communities Lab. This paper was supported by Agriculture and Food Research Initiative Competitive Grant no. 2012-68004-19894 from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Accessibility and viability: A complex adaptive systems approach to a wicked problem for the local food movement

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Submitted October 3, 2013 / Revised January 25, April 16, and May 17, 2014 / Accepted May 17, 2014 / Published online September 16, 2014

Citation: Nelson, C. H., & Stroink, M. L. (2014). Accessibility and viability: A complex adaptive systems approach to a wicked problem for the local food movement. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 191–206.
http://dx.doi.org/10.5304/jafscd.2014.044.016

Abstract

There is a tension between enhancing vulnerable people's access to local nutritious food and ensuring viable incomes for local farmers. This tension arises as a result of interactions and processes scaling outward to the broad level of economic and political ideologies (Ikerd, 2005; 2012). We suggest that by conceiving of this tension as a wicked problem and employing complex adaptive systems theory, we create space in which community members are empowered to share existing knowledge and develop new knowledge as they innovate potential solutions and discuss constructive change. We introduce this space as the beginnings of a dialogue-driven, shared journey through four features of the back loop of the adaptive cycle. Drawing on this theoretical foundation as well as Block's (2009) structure for creating a community of belonging, we hosted two one-half-day-long events for 90 community members, including farmers, food-insecure people, government representatives, and public agencies. This bottom-up, emergent approach to developing new system patterns may ultimately transform the domain of the problem and present viable alternative futures, which then may be adapted to the local reality and enhance community well being.

Keywords

complex adaptive systems, community capacity building, food accessibility, food security, local food systems, wicked problems

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Introduction and Purpose

There is a tension between enhancing vulnerable people's access to local and nutritious food and ensuring viable incomes for local farmers (Fischer, Hamm, Pirog, Fisk, Farbman, & Kiraly, 2013; Forbes & Harmon, 2008; Hinrichs & Kremer, 2002; Knezevic & Nelson, 2013; Landman et al., 2009). This tension arises as a result of interactions and processes scaling outward to the broad level of economic and political ideologies (Ikerd, 2005; 2012). Despite the challenges presented by this context (Ballamingle & Walker, 2013; Matson, Sullins, & Cook, 2013; Nelson & Stroink, 2011; 2012), the local food movement has been successful in increasing the availability and variety of locally grown foods in many communities. The purpose of this paper is to apply complex adaptive systems theory to explore this tension as a wicked problem through Block's applied framework for community-building conversations. While we present some limited evidence of the efficacy of this wicked problem process, our primary focus is to explore the process itself as a possible way of moving forward with challenges like the tension between local food affordability and farmers' incomes that often seem contradictory and impossible to resolve. We view this paper as a catalyst to explore the appropriateness of using a wicked problem approach to conceptualize the complex issues that arise as alternative food systems emerge dynamically through the complex interactions of people on every level from the individual to the political, economic, and societal.

As the local food system emerges as an alternative food system within our global, commodity-based economy, local foods are often too economically costly for a large portion of society (Lappé, Clapp, Anderson, Broad, Messer, Pogge, & Wise, 2013; People's Food Policy Project, 2011). Locally produced food may be more costly due to the economies of scale at the farm level. Farms supplying local food direct to consumers are smaller on average, with higher per unit costs. In addition, there is a long history of a great variety of government social and ecological subsidies that support a large-scale food system that can lower the costs of mass-produced food. The higher cost of local food presents a complex challenge for those on the grassroots level of the local food movement, who are often motivated by concerns with environmental protection and enhancing the local economy, as well as with social justice and equity (Nelson & Stroink, 2013).

This issue of enhancing vulnerable people's access to local nutritious food while ensuring viable incomes for local farmers has been the subject of some discussion (Forbes & Harmon, 2008; Knezevic & Nelson, 2013; Landman et al., 2009; McEntee & Naumova, 2012). Utilizing complex adaptive systems theory, we sought to harness the capabilities and capacities of community members, including both vulnerable people and farmers, to share and develop knowledge as they innovate potential solutions themselves. While no obvious solution to this issue currently exists, our approach may present a suitable framework within which to conceptualize the issue and a method with which to seek community-driven solutions to intractable and complex issues. Thus, we emphasize that our focus is on elucidating the process of a wicked problem approach through a complexity perspective using Block's (2009) foundational approach to community capacity building.

Wicked Problems and Complex Adaptive Systems Perspective: The Theoretical Framework

There are two key questions at the heart of this issue: (1) How can communities enhance vulnerable people's access to local nutritious foods? and (2) How can communities ensure that emerging local farmers are able to earn viable incomes? Both of these questions, in and of themselves, address complex and interacting issues at the social, environmental, and economic levels such as transport, loss of scale economies, and production methods. For example, in Canada as elsewhere, vulnerable people's access to local nutritious foods has been negatively influenced by a steady retrenchment of a social safety net including decreased levels of, and heightened eligibility restrictions for, both social assistance and EI (employment insurance), insufficient minimum wage standards, and increasing mismatch between worker skills and job growth areas (Federation of Canadian Municipalities, 2010). Moreover, creating viable levels of income

for emerging young farmers involves serious challenges, including the cost of land, lack of space for new farmers and for alternative markets within supply management systems, limited regional processing and distribution infrastructure, and regulatory barriers affecting small- and medium-scale producers (Baker, Campsie, & Rabinowicz, 2010; Landman et al., 2009).

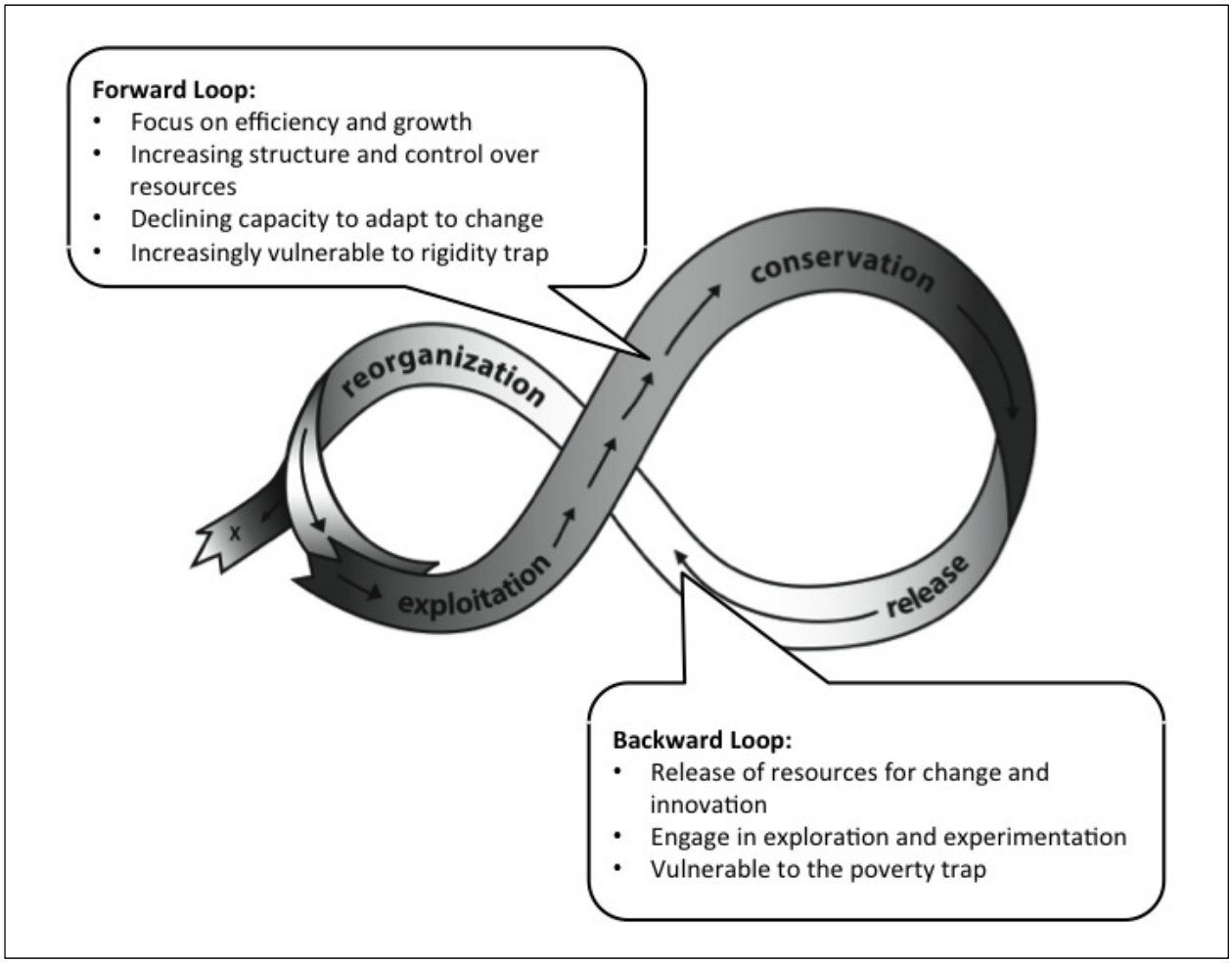
Resolving the tensions between vulnerable people's access to local nutritious foods and creating a viable income for emerging young farmers has no obvious solution and may be best conceived as a wicked problem (Conklin, 2005; Head, 2008; Rittel & Webber, 1973). A wicked problem may be described as a problem, typical of social planning and policy situations, that is difficult or impossible to solve because there is no one socially agreed-upon correct solution and no consistent or undisputed set of expectations or qualifications for determining optimal solutions (Batie, 2005; Rittel & Webber, 1973). Bringing together the complex, open-system contexts shaping both sides of this issue — food systems and social-economic-political systems — can assist in discerning the dynamic scope of the causal webs producing this wicked problem. By approaching our analysis as a wicked problem and abandoning linear attempts at finding a "solution," space is created for discussing constructive possibilities. Rittel and Webber (1973), referring to "second generation" systems approaches to problem solving, recognize that wicked problems cannot be solved by classical approaches that involve sequential steps, from gathering information through synthesizing to solving. Instead, these problems must adopt a dialogue-based approach, where a problem and its solution emerge gradually among participants, through incessant "critical argument" (p. 162). In the planning field, Kunz and Rittel (1970/1979) developed a technique called the Issue-Based Information System to address wicked problems through dialogue. Since then, similar approaches have been developed in the community development literature (Born, 2012; Brown, Harris, & Russell, 2010; Diers, 2004; Headwaters Group, 2012; Roberts, 2000). Manson (2001) recognizes that complex social problems emerge from the dynamics of interacting complex systems, and resolution to a complex problem must engage everyone's participation.

While wicked problems and complex adaptive systems (CAS) theory developed along complementary but parallel pathways, they share origins in a complexity perspective. As such, CAS theory provides a clear perspective for understanding the wicked problem concept, especially in light of the complex social and ecological systems out of which wicked problems tend to emerge (Goldstein, Hazy, & , 2011; Gunderson & Holling, 2002; Holman, 2010; Walker & Salt, 2006). We draw on a CAS theory perspective to describe the food system, as well as to describe the process through which knowledge and innovation emerge in community gatherings.

Our research to date on emerging local food systems has revealed a diversity of creative approaches to local food production and distribution. Interviews with those behind such local food initiatives reveal concerns with environmental sustainability and social justice. We describe these local food initiatives as self-organizing and driven by volunteers in the absence of sustaining operating funds (Nelson & Stroink, 2013). We have argued elsewhere that the food system can be understood to be a complex adaptive system (Stroink & Nelson, 2013). Specifically, local food initiatives, their networks of people, as well as the collective space of the local food system and the broader overall food system can each be understood to be a complex adaptive system, nested within systems on higher scales and containing systems on lower scales, all interacting with one another in a dynamic and emerging manner. Conceptualizing the food system through this lens allows for a number of novel insights.

For example, Stroink and Nelson (2013) argued that the development of the local food system can be mapped onto the adaptive cycle (Holling, 1986). The adaptive cycle (Figure 1) is a representation of change over time in complex adaptive systems. These systems tend to move through a forward loop of increasing structuredness to a point, known as rigidity trap, when the system's capital is completely consumed in the maintenance of those structures, with relatively little available for new growth or innovation. The

Figure 1. The Adaptive Cycle of Growth and Release (based on Holling, 1986, 2001; see also Stroink & Nelson, 2013)



structure of a complex adaptive system is its order, which gives shape to and increasingly focuses the patterned behaviors of the system into specified pathways. This structure holds the behavioral pattern of the system into place and becomes increasingly formalized throughout the forward loop. The back loop is characterized by the collapse of this structure and the release of capital to be available again for novel combinations of diverse elements and experimentation with new forms of structure. Stroink and Nelson (2013) argued that the mainstream food system may be viewed at the height of the forward loop, with local food initiatives emerging within the backward loop or the very beginnings of a new forward loop. Those who create local food initiatives may attempt to use small amounts of capital released from the dominant system (and brought in from other systems, such as academic or health) to support the emergence of creative and diverse approaches to the local food system.

It is important to note that human communities are organized as complex adaptive systems. Understanding them as such leads to the recognition that bringing together diverse individuals within the community (increasing network connectivity) increases the possibility of innovation and the emergence of new knowledge (Könnölä, Brummer, & Salo, 2007). Thus the previously studied northern Ontario (Canada) food initiatives have emerged as a result of community-level connectivity that has self-organized in diverse ways to

yield an abundance of possibilities. This diversity and connectivity uniquely blends local resources to enable actors to create vibrant community-based food systems. This complexity-based perspective on community and innovation appears consistent with recent advances in the community development literature (Block, 2009; Born, 2012; McKnight &, 2010). Together, they recognize that it is the community itself that will form the alternative dynamics that may ultimately address this wicked problem of how a community can enhance access to nutritious local food and support the viability of emerging new farmers.

The Gatherings

Drawing on this theoretical foundation, we developed two half-day events that brought together 90 community members, including farmers, vulnerable people, staff members of government and public agencies that provide emergency food programs, policy advocates, and staff of programs serving vulnerable peoples (Food Security Research Network [FSRN], 2013). Many participants had multiple roles, such as students who were also vulnerable persons, students who were farmers, and students who worked for public and government agencies. For the present purposes, we considered vulnerable people to include those requiring employment insurance or social assistance, as well as the working poor, people living with various disabilities, and students struggling with high post-secondary educational costs. We followed Block's (2009) structure for creating this community of belonging: we named the event a community gathering; we paid attention to public space and the representation of the two half-day events in the invitation; we centered conversations on possibility, ownership, dissent, commitment, and gifts. We also used the speed networking and World Café approaches, as these are believed to liberate participants from the constraints of existing mental structures (Brown & Isaacs, 2005; Lipmanowicz & McCandles, 2013, 2014). Community service learning (CSL) university students from two macro community theory courses participated in the Gatherings and also wrote reflective essays on their experiences. As stated earlier, while the focus of this paper is on the wicked problem process, several of the student observations from both days are included to provide clarity to the central themes that emerged through these Gatherings.

By paying attention to language and naming our events "Gatherings," we attempted to open up space where every participant had voice and the specific content of each gathering arose from within, rather than from a predetermined agenda. In addition, nine months prior to the two Gatherings we sought out a public and accessible site that was welcoming in appearance, had nearby bus access, and was close to a food court and shopping mall. The gathering site was city-approved for a maximum of 45 persons, so this became the determining number for each of the two Gatherings. This group size also fit Block's (2009) belief that the small group is the unit of transformation, rather than a community-wide public meeting. The students created the invitation in a fourth-year macro community theory course as part of their CSL experience. The invitation followed Block's invitational approach of being clear about who is invited so as to ensure diversity by purposefully extending the invitation to people who were not used to being together, naming the possibility about which the gathering was convening, emphasizing freedom of choice in deciding whether to attend, describing what the gathering was about, and making the invitation as personal as possible. Specific wording included naming the event a Community Gathering, enhancing the welcoming atmosphere by indicating local food would be served, and raising the invitational question: *Want to add your thoughts to how our community enhances access and availability of local food to vulnerable community members and also ensures economic viability for our local producers and processors?*

Besides widely circulating a poster, several "mini-coffee gatherings" were held six and one months before the Gatherings with local community leaders recognized for their place-based work with vulnerable peoples. From these mini-gatherings, many logistics were worked out, such as the appropriate time of day for the Gatherings, city bus schedules for easy access, the use of round tables for interactive discussions, and the decision to only identify participants by first name on nametags. The latter two decisions were effective in mini-

mizing hierarchical differences and presenting an environment in which all voices were welcome. After the Gatherings, students reported that other than the few participants who self-identified, they were unable to identify the specific representation of the participants. The advisory committee confirmed that there were indeed vulnerable people at the Gatherings.

On the day of each Gathering, the participants entered a room where smiles and greetings of welcome were shared, heightened by the warmth of the room itself with large student foodie posters on the walls, old wooden floor, walls painted in subdued and warming shades of purple, abundant natural light from large windows and several sky lights, and round tables that could each seat eight to 10 people.

> After everyone was seated, the convening leader restated the invitation, explaining why we were all gathered together to search for possibilities in creating more affordable and accessible local food to vulnerable populations and where farmers have a sustainable income. The convening leader spoke to everyone without the use of props — no PowerPoint or slides — and she was genuine in making this an open discussion where we could explore gifts and possibilities. It was not some gathering that was slapped together because we had to for our curriculum; it was heartfelt and engaging, because it had meaning. [Student description of the Gatherings]

An intellectually *liberating structure* called speed networking was then introduced in both Gatherings. Everyone was asked to find someone unfamiliar in the room and share with each other for seven minutes what they hoped would be created by coming together for these Gatherings. This sharing through speed networking was repeated twice for each of the two Gatherings. This approach had several advantages: eager talkers had an opportunity to immediately express their views; those who were a bit shy had the opportunity to engage and express their ideas in one-to-one dialogues; and everyone had a chance to "practice" articulating ideas as a "trial run" for sharing their thoughts with the larger group. This also allowed participants to get to know others without having to use formal introductions that would encourage labeling. By using the speed networking exercise, we encouraged all participants to have a voice.

Next the group was asked to help themselves to regionally sourced food prepared and presented by a local city caterer. The convening leader then asked the participants to come back to one of the tables and spend 20 minutes discussing with each other "How they create food security for themselves." This approach encouraged an atmosphere of equity as everyone engages on a daily basis in acquiring food. The convening leader provided examples as a catalyst for further interactive discussions: "My neighbor has a garden and shares with me," "I take my family to eat dinner once a week at my mother-in-law's house," "I carefully watch for food sales." These examples legitimized everyone's approach and opened up space to keep the back loop of the adaptive cycle operating in releasing creative ideas.

> There were several creative ideas that we brainstormed as partners, regarding how our community currently puts food on our tables. Some of these ideas include: swapping with neighbours, collective kitchens, dietician involvement, community gardens, gleaning, farmer's market, family and friends' gardens. One that stood out for me in the group discussion, which I had not thought of was hunting. [Student reflection]

Next, participants at each table shared their ideas with the larger group of how to be more food secure. Each table was equipped with a flip chart and colorful sticky notes for posting their ideas. From these presenting ideas, as depicted in Figure 2, four major themes were selected for a World Café exercise (Lipmanowicz & McCandless, 2014). This process gives all participants a chance in a small-group format to engage in each of the themes. Figure 2 summarizes the specific table topics chosen by the participants under each of the

Figure 2. Enhancing the Local Food Movement: Summary of Participant Responses from the World Café Exercise

four themes. Examples include barriers and solutions to increasing the use of collective kitchens; participation in community gardens; enhancing the viability of farmer incomes; and barriers and food-related policy, including municipal bylaw, zoning, and policy issues.

Each of the two half days ended with each person having one minute to share with all attendees what was one "take away idea they gained from the day."

> In asking this question, everyone took a turn sharing their main thought that stood out for them during the Gathering. I found this to be a great summarization of how creative everyone can be when we come together with a diverse group of individuals whom have never met before. For myself, it refreshed my memory of important points that I would like to take away with me. I hope that some of these ideas will stick with me in my work and daily life. This Gathering has created a consciousness for me when purchasing foods and has got me thinking of how I can assist in making my own small changes in our community. [Student reflection]

Discussion

We designed the space for the Gatherings very carefully so that the members of the community engaged in the process could begin a dialogue that

may ultimately lead to action to address this wicked problem. The deliberate assembly of diverse voices and the care we took in creating experiences that opened discussion and minimized the importance of existing mental and social structures resulted in an environment that supported the sharing of knowledge and the capacity for innovation (Weber & Khademian, 2008). This approach to the Gatherings arose through consideration of both Block's (2009) writings on five conversations that enhance community belonging (summarized in Table 1) and key concepts from CAS theory that reveal how wicked problems can be explored and possibly resolved within community.

Wicked problems emerge from the interacting dynamics of multiple open complex systems. Each of these interacting systems has achieved some degree of structure, having moved up the forward loop of its own adaptive cycle. For example, the complex system in which emergency food, social service and health agencies, government ministries, and others interact in the service of vulnerable people is heavily structured by established formal and informal patterns and habits of interaction, roles, and social norms. These structures organize and enable the activities of that system, but also constrain the thinking, idea generation, dialogue, and behavior of those within that system. The complex system that surrounds local farmers, particularly in relation to the wider food system, has likewise achieved some degree of structure (Stroink & Nelson, 2013). Thus typical attempts to address the wicked problem of the economics of food access and small farm viability seem to emerge from conceiving of these two aspects as two relatively structured entities knocking into one another. Efforts to work with this wicked problem will need to open a safe space in which individuals from both systems can mentally de-structure and play in an emergent new space characterized by diversity, connectivity, and engagement. To *de-structure* in the lens of complex adaptive systems theory and the adaptive cycle is to release mental structure in the form of beliefs, assumptions, and roles in cases where these have become overly rigid and unresponsive or maladaptive in a dynamic context.

This space allows the beginnings of a dialogue-driven, shared journey through the back loop of the adaptive cycle (Figure 1). It begins with (1) the loss of structure typical of the creative destruction or release phase (*de-structuring),* then (2) embraces the *diversity* that emerges as people from previously isolated structures begin to connect. It then (3) nurtures this *connectivity* and (4) *engages* actively toward the generation of ideas or solutions. Within these four features of the back loop we reveal a different light on Block's (2009) five conversations on community belonging and see how both played out in the Gatherings.

De-Structuring

One of the hallmarks of CAS theory is the adaptive cycle (Gunderson & Holling 2002; Holling, 2001). This theory, while originating in biophysical processes, has been viewed increasingly as relevant to illuminating social processes (Daedlow, Beckmann, & Arlinghaus, 2011; Dooley, 1997; Stroink &

Table 1. Summary of Block's (2010) Five Conversations for Building Community Belonging

Possibility	A conversation that focuses on building a new future of living well. It is neither a plan nor a dream, but a declaration that can become a catalyst for transformation.
Ownership	A conversation that begins with acknowledging how one has contributed to creating the current community reality. Subsequently this becomes a stance from which to initiate new action, rather than to assign blame.
Dissent	A conversation that opens up space for diversity in beliefs about our collective community future.
Commitment	A conversation that embraces a promise of action for change that is made independent of approval or reciprocity from others.
Gifts	A conversation that focuses on strengths that have the potential for transformation and brings talents that are currently on the margins into the center.

Adapted from Block, P. (2009). *Community: The structure of belonging.* San Francisco: Berrett-Koehler Publishers, Inc.

Nelson, 2013). A key insight of this perspective is recognizing the importance of the creative destruction phase to the overall resilience of a complex system. In the loss of existing structure, a complex system, whether it is a business or an ecosystem, can adapt to changing circumstances and innovate. A turn through this release phase need not be a total collapse and can be conducted in a managed way so as to protect the essential functioning of the system, even as some of the system's capital is reinvested in new growth. Through simple details such as the use of only first names and no affiliations on nametags, the Gatherings attempted to replicate the experience of releasing structure in a safe space. Another CAS concept relevant here is the ecotone. The ecotone is the area near the edges of two adjoining ecosystems, such as where a forest meets a grassy lawn (Risser, 1995). Because neither system's structure has complete organization at the ecotone, there tends to be an abundance of diverse growth, greater than is seen in either system alone. This is why community psychologists speak of "leveraging the power of the ecotone" when attempting to enhance innovation and growth in communities (Kagan, 2007). By focusing attention and nurturing dialogue at the ecotone between local food and vulnerable people, the Gatherings created a space in which people could play with a momentary "mash up" of structure.

The framework for our wicked problem encouraged participants to experience and engage in all five of Block's community conversations of belonging: possibility, ownership, dissent, commitment, and gifts (Block, 2009). The first of these, possibility, produces a de-structured state of mind in participants. Specifically, the focus for the dialogue is on active engagement rather than on deficit thinking that can keep communities stuck. Possibility is about being and aliveness; rather than making passive declarations of what we think *should* happen, instead saying what are we *going* to do. The Gatherings began with a possibility question of "what do we want to create today?" This question focused attention beyond existing structure to a future of possibility. Indeed, this question created a deep conversation where people discussed an abundance of diverse ideas, such as having a traveling food bus full of fresh local produce, either for sale or for donating; more community gardens, especially along bus routes and bike lanes; community gatherings and opportunities to teach citizens how to garden; and raised gardens for individuals who have limited back-yard space or need assistance with accessibility.

> Some ideas that were shared during this discussion were: to have neighbourhood gardens, where neighbours would each grow a certain vegetable, and then share amongst themselves; having more good food boxes, and how to go about this (i.e. volunteering to help with the production of these boxes); encouraging trade among farmers; educating around herb gardens in kitchens and promoting cooking classrooms; and most importantly, how to go about involving children so that it would continue through the generations. [Student reflection]

Diversity

After a complex system has encountered a release of structure (e.g., following a forest fire), a diversity of resources and entities can now encounter one another in new ways. This diversity is key to the adaptation, innovation, and regrowth of the system (Page, 2011; Westley, Zimmerman & Patton, 2006). Likewise, another reason that ecotones are characterized by abundance and innovation is the effect of diversity, as elements from different ecosystems encounter one another. Diversity is a key characteristic of CAS theory, as it creates the robustness needed for the emergence of self-organizing possibilities, adaptation to change, and resilience. In our Gatherings, the participants themselves brought diversity through their perspectives and also through their experiences rooted in their positions in society.

Diversity is also a key concept in the community development literature. For example, Born (2012 emphasizes the importance of diversity in creating community transformation. Dissent is recognized in Block's five conversations as critical to successful community conversations. By organizing our Gatherings to allow for dissent and doubt to emerge we fostered space for diversity in opin-

ions to be expressed on the wicked problem. Expressions of dissent were simply respected. For example, some dissent was expressed that our Gatherings were futile, as a group of diversified community people can not possibly resolve this wicked problem because we have neither the power to convince the government to fund our ideas nor the financial capacity to advance those ideas. Perhaps the lack of labeling of participants fueled this dissent as many people may be more comfortable dealing with a wicked problem when they are aware of people's positions and thus consciously or unconsciously weighing the power in the room to create change. Or perhaps the lack of labeling was uncomfortable as the conversations at the Gatherings could not occur within the more typical dichotomous us-them framework. As Block cautions, dissent should not be answered as this can shut down diversity in opinions. Rather diversity conversations are times to listen and encourage expression of everyone's differing views.

The Gatherings encouraged this diversity by opening up participation from a wide sector of community people, holding the Gatherings in an accessible location with affordable bus transportation, and avoiding any "us and them" labeling.

> It went without asking, that people had certain doubt about making these initiatives work amongst our community….Thinking back to discussions with peers, particular individuals did hold views of disagreement, to which is their own right and choice. Overall, I found among my individual small group that there were more positive, empowering conversations taking place than not. Remember, "Dissent is a form of caring, not one of resistance." (quotation from Block, 2009, p. 136) [Student reflection]

Connectivity

Our journey through the back loop next involves the nurturing of connectivity among the diverse elements. Interconnectivity is a defining feature of any complex adaptive system; the behavior of the system as a whole emerges from the interconnections among its components (Hollings, 2001; Meadows, 2008). Too often, outside experts or leaders in a traditional hierarchical organization may impose a rigid structure on the system's connections that is not well suited to the actual functioning of the system. In contrast, without this imposition, this connectivity from a complexity perspective may self-organize when individual elements in the system (people) choose the extent and type of connections they form. This connectivity then facilitates the emergence of a new form of structure. Nurturing the self-organization of connectivity among the diverse individual elements is critical to encouraging new ideas and new system behavior in light of our wicked problem.

Drawing on CAS theory, Lichtenstein, Uhl-Bien, Marion, Seers, Orton, and Schreiber suggest that leadership occurs in the "spaces between agents" (2006, p. 3), and that by fostering a receptive environment, rather than imposing rigid structures and procedures, the leadership that emerges will not only be more reflective of the agents but also more adaptable, and therefore resilient as well. They refer to this form of leadership as emergent leadership (Lichtenstein et al., 2006). Similarly Block advocates for convening leadership that creates the social space for community engagement (Block, 2009).

Language can itself be considered a complex adaptive system (Steels, 2000), and the conceptual evolution that occurs during a group discussion can be understood as the co-evolution of an idea within the minds that have started it. Within the complexity perspective, there is no barrier between the development of an idea and the development of those who are discussing it. Ontology and epistemology lose their hard edges (Allen & Varga, 2007). By embracing this co-evolution, we may promote conceptual growth within society by shaping the discussions we have.

This connectivity also enables individuals to see how the wicked problem of food access and farm viability appears to people in different social situations, and to recognize its connections with income, education, and well being as basic social determinants of health. In the Gatherings, it was important to carefully nurture connectivity that was not predefined by existing structure or imposed by outside leaders.

Enhancing connectivity can also decrease the length of feedback loops. The need for tighter feedback loops, which connect the consequences of behavior to the people generating that behavior, has been identified by others studying local food systems (Clancy, 2013).

Connectivity is key to dialogue-based approaches to social change in the community development literature. McKnight and Block (2010) focus on the value of associational life whereby people are encouraged to enhance connectivity in addressing access to entrenched social issues. In other words, McKnight and Block find that social processes that encourage more community associations and connections have been found to be effective in addressing complex social problems. Likewise, Block's (2009) fourth and fifth conversations (Table 1) recognize the value of a focus on commitment and gifts to address the issue. For example, focusing on gifts and strengths, rather than deficiencies, needs, and deficits, creates a shift in the conversation about access to local nutritious food for vulnerable peoples and income sustainability for emerging farmers. Thus, focusing on gifts provides value to diversity and encourages connectivity and networking.

> Truthfully, prior to taking this course and attending the Gathering, I was very naïve about the vulnerable people and emergency food assistance within my community. When I reflect on my story and the context in which I operated from, I saw the poverty, isolation and distress on the streets of Thunder Bay, but like many, I would just drive by and turn a blind eye to that world. When I was younger, and I wanted to do something "good", I was that person that thought they were doing an amazing, selfless deed by volunteering my time at the shelter house, handing out unappetizing food to the "homeless". **Then it hits you and it hits you quite hard** — I am a contributor of what is happening around me, I am a part of the cause, and I needed to change my current story. This course and Gathering encouraged me to create truth in my story and the stories that are presented to me. Escaping the "stuck community" mindset and seeing the world through a new lens, where I am accountable and own and exercise my power every time I show up. It is time to override the powerlessness as use of blame and dependency on others to make the change I wanted to see. For so long, with influence from family, peers, society, etc. poverty has been labeled as an individual problem; however I now recognize and understand that I am accountable for the well-being of the whole and acknowledge that a community is built by great citizens. I reclaimed my power, was a risk taker for the first time and become a creator of my community by offering my gifts and valuing others at the Gathering. I felt a part of something and had a sense of belonging among strangers, which is something that just evolved naturally throughout the Gathering. [Student reflection; emphasis in original]

> As wonderful ideas were shared, a sense of relatedness and belonging was beginning to form and it became easier to ask questions, speak openly and take risks. This is where I began to recognize even more how my current story was sometimes hindering the possibility of an alternative future. I've never been a part of a community garden, spoke with local farmers or even participated in a community kitchen before but I knew there was something in me that I could use to contribute to this change. If this community is mine or ours to create, then where was my contribution? It was time to develop some personal power and not let someone else change this current reality, it was time I became involved in this transformation. [Student reflection]

Active Engagement

As the diverse new connections self-organize, potential solutions to the wicked problem, new ways of structuring relevant complex systems and their interactions, or innovative ideas begin to emerge. In order for this progression to occur, the

elements within the system (people) must not only release existing structure, they must also engage actively with the process. One way that human complex systems may be different from other living systems, such as ant colonies, is that people, to varying degrees, can become conscious of how they participate in the emergence of particular patterns in their systems. This awareness, coupled with a willingness to make change, will be required in order for new patterns or solutions to emerge.

Block's (2009 conversation on ownership begins with the creation of a feedback loop whereby all participants can enhance their awareness of how they have contributed to the current reality of the wicked problem. Through this awareness a shift can occur from blaming the government or others for the current situation to becoming accountable for how our actions or lack of actions has contributed to the problem. In the Gatherings, we were careful to foster ownership by, for example, having no keynote or outside speaker. The emphasis was thus on engaging each participant as a valuable citizen producing the future, not waiting, begging for, or dreaming of the future (Block, 2009).

> We were discussing why we were not "allowed" to consume whatever food products we wanted due to health regulations set out by government agencies. Each member at the table shared their personal story about struggles with these laws. One invitee mentioned that she would much rather drink and use unpasteurized milk, but is unable to find a supplier, as it is illegal to sell. Another invitee brought up the question as to why we don't have a chicken processing abattoir in Thunder Bay as she has chickens to sell, but cannot sell them unless they are alive and most people do not have the means to slaughter their own birds. A third person also questioned why we do not see wild game on more menus in Thunder Bay and why we do not have a restaurant that serves traditional Anishnawbe cuisine. After everyone shared their piece, the general consensus was why are we not able to select what we want to consume, sign a waiver releasing the producer and government of responsibility and do with our own bodies as we please? [Student reflection]

> If you have a sense of belonging in your community, then you feel accountable for what you contribute. You are less likely to leave the responsibility of change to others and be conscious of your influence. Having the ownership conversation allowed me to see the reverse effect where accountability came first, and then I felt a greater sense of belonging. This was my experience anyway. I am a believer in change, but ownership, responsibility, and accountability had never been a starting point for me. I expect that others may have felt this as well, which put us in a good position for the community Gathering; we proceeded to open our mind to possibilities, while also feeling and seeing our position for change-making in it all. [Student reflection]

Block's (2010) final conversation on commitment involves the individual's choice to initiate change, even on a small scale. A commitment to change or action is essential if an extant system is to leave the back loop and progress to the forward loop of a new system.

Conclusion

According to Block, there is a "default" tendency for people to walk into a room assuming that all the happenings and the agenda belong to someone else. Our world is inundated with those who want to convince us about what we should believe and how we should act. Through a very deliberate set-up, which included mindful awareness of how people were identified and welcomed, a welcoming physical space, and conversational tone, the Gatherings brought participants together on a journey through the back loop of the adaptive cycle. The Gatherings encouraged a shift toward a view that together we all have a legitimate role in creating our community. Block refers to this as moving the citizenship social contract from "parenting to partnership" (2010, p. 128).

A unique paradox that is presented by using a wicked problem approach in gatherings such as these is that in order to foster a de-structured mind-set, we must carefully ensure that people are not identified by their roles at any time, from invitation through to the gatherings' dynamics. However, this makes it impossible to establish the role identities of the participants in attendance. Our experience with this process has revealed that any attempt to identify people by their formal roles (such as job titles or status as vulnerable) thwarts or inhibits the mental de-structuring so critical to opening a space for genuine dialogue. In holding this paradox, organizers of gatherings such as this must work carefully and extensively well in advance to reach out through formal and informal networks to ensure that there is the inclusiveness and diversity essential to the effectiveness of a gathering.

With Block's (2010) five conversations as a guide, the Gatherings provided a dynamic space in which enough of the usual systems' structures were removed that people were able to release into a back-loop mindset. This mindset enabled open and innovative conversations that were fed with the diversity of perspectives that were deliberately brought into the conversation from local farmers to individuals living in vulnerable conditions. Ensuring access to local nutritious food for vulnerable people while also ensuring viable incomes for local farmers is a wicked problem emerging from the dynamics of multiple complex systems in interaction. Amelioration of this issue is going to require transformative, system-scale change. The purpose of this paper was to describe an approach to addressing wicked problems that enables community members to release some of the structure in existing systems and innovate potential solutions themselves. Future work with this model will be to study the transition from back loop to forward loop. In other words, once the existing structures have been released and a diversity of new connections among engaged agents have been formed, how do emerging ideas gain traction and develop into tangible, system-scale change?

The purpose of this paper was to draw on complex adaptive systems theory in applying a wicked problems approach to understanding dynamics within the food system. Future research in this area is needed to assess the effects of this approach on people's thinking and dialogue about the issues, as well as their capacity to innovate potential solutions in the changing landscape of the food system. This bottom-up, emergent approach to writing new systems' patterns may ultimately transform the domain of the problem and present viable alternative futures that are adapted to the local reality and enhance community well being.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Language as lever: Can the lexicon of local make a global impact?

Book review by Stacy Miller*
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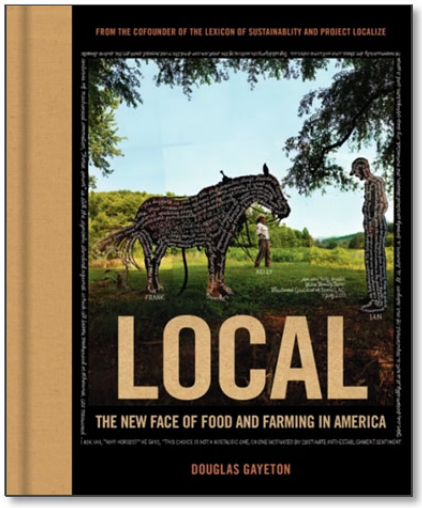

Local: The New Face of Food and Farming in America, **by Douglas Gayeton**

Gayeton, D. (2014). *Local: The new face of food and farming in America.* New York: Harper Design. Available as hardcover and ebook. Publisher's website: http://www.harpercollins.com/books/9780062267634

Published online August 19, 2014

Citation: Miller, S. (2014). Language as lever: Can the lexicon of local make a global impact? [Book review of *Local: The new face of food and farming in America*]. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 207–212. http://dx.doi.org/10.5304/jafscd.2014.044.008

> "Lacking any intrinsic value, words are only valuable in an instrumental way. Thus, the value of words resides in their ability to accomplish something."
> —Michael Suarez, *The Book: A Global History*

Infused with the ambitious energy of spring, I eagerly volunteered to review *Local: The New Face of Food and Farming in America* by Douglas Gayeton. By June, I felt a bit like Alice, plunged into a multimedia wormhole wonderland. The book is only one fruiting body of The Lexicon of Sustainability Project, founded in 2009 by Douglas and his wife, Laura Howard-Gayeton. The website says the project "educates, engages, and inspires people to pay closer attention to how they eat, what they buy, and where their responsibility begins for creating a healthier, safer food system in America" ("'Local': The Book," n.d., para. 4). You have likely encountered Gayeton's information artworks, seen one of 24 beautifully bite-sized short films as part of PBS's *Know Your Food* film series, or perhaps checked out the website, http://www.lexiconofsustainability.com. If you haven't, you will. In fact, go ahead. I'll wait.

Unique artistry aside, *Local* is a different kind of book, which is obvious from its first page. Here,

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the author implores the reader to give it away. He knows that his work does not belong on your shelf, or even on posters at a sustainable agriculture conference. The book belongs on your socialite Aunt Helen's coffee table, the information artworks plastered on the wall of a public library or a restaurant bathroom stall, and the videos played in high school homeroom. In short, if you are reading this book review, you are more than likely not its target audience.

This is why I begin my review with *Local*'s last page rather than the first. It's here, in the afterword, that Gayeton fesses up: the purpose of every photograph, interview, and anecdote, he admits starkly, is to "explain climate change" (p. 270). He does this by distilling complex system issues into more accessible, palatable, and solutions-oriented vocabulary, using food as the lens. Refreshingly, he leaves the gory guilt trips to food documentaries of the *Food, Inc.,* ilk; he instead offers a comprehensive, illustrated glossary of terms for myriad solutions happening on farms, fisheries, co-ops, bakeries, seed libraries, back yards, and city rooftops that, collectively, just might add up to systems change.

There are few forks unturned in this visually engaging book, as Gayeton attempts to elucidate elements of culture (e.g., *food sovereignty*), politics (e.g., *veggie libel laws*), and economics (e.g., *true cost accounting*) in relation to food being produced, distributed, sold, and consumed. Some terms, like *locavore,* are familiar to nearly anyone, while others tend toward the academic ecologist (e.g., *filter feeding bivalves, mycoremediation*).

I give a lot of credit to a former film director who can find a compelling poster child for, and condense the complexities of, expansive terms like *economies of community* (see Figure 1), *soil food web, GMO,* or *traceability*. With my bias as former executive director of the Farmers Market Coalition, I initially bristled at the omission of *farmers market* as a term, but can appreciate how it actually serves to expand the reader's traditional trope for "local food." Farmers markets are, after all, the stage for his terms *locavore* and *SNAP,* both of which were photographed at markets.

A person and a place illustrate each of the more than 200 terms featured in the book, which

Figure 1. *Economies of community* is one of the more than 200 illustrated terms included in *Local*, featuring Benzi Ronen of Chubeza Farm in Israel (p. 28). Image used with permission of The Lexicon of Sustainability.

Gayeton says took his team four years to identify and vet with 500 thought leaders around the United States. There are the obvious (and still venerable) poster children — Alice Waters, Joel Salatin, Temple Grandin, Eliot Coleman, Wes Jackson, Will Allen, and others — whose published works or features in documentaries have given them some status in popular culture. And indeed, they are responsible for some of the many golden-nugget quotations, like "Chemical fertilizers instill soil with an imposter vitality, a bit like plastic surgery" (John Peterson, featured in the documentary *The Real Dirt on Farmer John*). Some of the more valuable profiles, however, represent lesser known terms like *forest raised, maximum sustainable yield (MSY),* and *crop rent calculator.* Gayeton amply covers the fishery sector, problems with which the media have been slow to examine even as nutritionists stress the value of fish in the human diet. Here, terms like *tragedy of the commons, keystone species, chains of custody,* and *exclusive economic zones* are explored.

The disciplined cursive annotating each artwork will be familiar to readers of Gayeton's 2009 book, *Slow: Life in a Tuscan Town.* In this case, the text in the border is not author commentary but is instead the actual words of the person or people featured in the image (for example, see Figure 2).

While some subject matter experts might be tempted to dismiss the "snapshot" nature of each term's profile as cursory, skeptical that anyone could explain *external costs* in a single-page image, most of the artwork does much more than simply scratch the surface. In a handful of cases, this is problematic, as the relationships between terms featured on different pages seem disjointed. I found myself squinting with the book inches from my face in order to read the nearly inscrutable

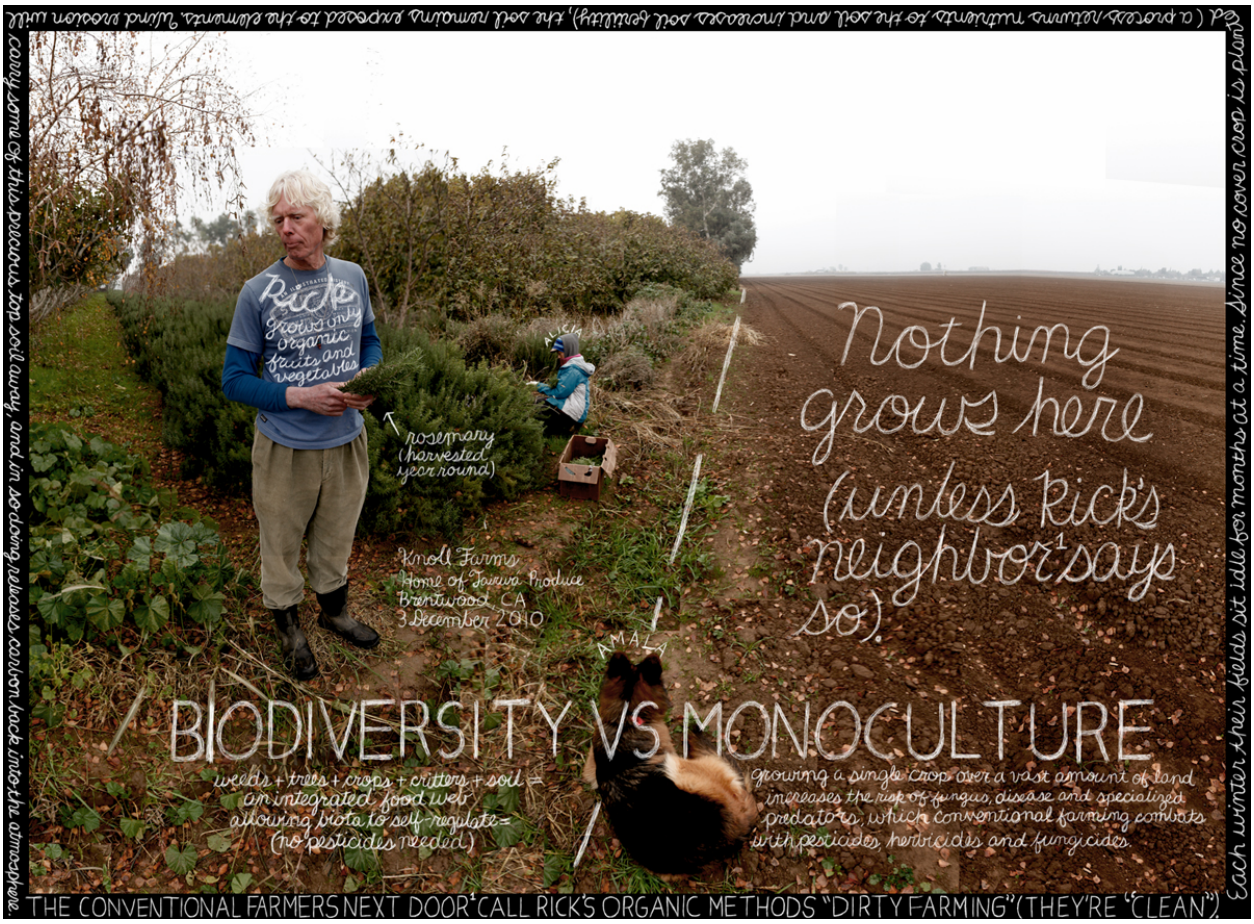

Figure 2. In *Biodiversity vs. monoculture,* Gayeton captures in one image a rare instance of one term immediately adjacent to its opposite (p. 115). Image used with permission of The Lexicon of Sustainability.

footnotes in white cursive that adorned *new food economy, relocalize,* and *slow fast food* (p. 40–45) — three entries inspired by a partnering farm, slaughterhouse, and restaurant in the Athens, Georgia, area. Most art, after all, looks best hung a large format, liberating viewers from the task of turning pages with bifocals. Harper Design, the publisher, probably had this in mind when it equipped the book with icons that readers with iOS or Android mobile devices can scan to instantly view the associated short film on their phone or tablet. I found this to be a convenient way to dive deeper, even as I wished for an alphabetical index so that I could reference my "favorite" artworks more quickly.

People already versed in sustainable agriculture systems could still learn a lot from this book, as it covers a surprisingly wide spectrum of issues. I better understand the buzz about *biochar* (p. 121–123), for example, and added some new terms like *"cow to pickup truck" index* (p. 182) to my vocabulary. I also feel I've met a wider spectrum of innovators around the country whose work is quilting together, stitch by stitch, a series of more creative, diverse, and resilient food networks.

The question, then, is not whether Gayeton's glossary is accurate or comprehensive. It's whether his theory of change (simply put, that "Your words can change the world," which he says at the close of every short film) holds water, especially when it comes to the seemingly Sisyphean task of tackling (or even slightly mitigating) climate change.

According to the CGIAR Research Program on Climate Change, Agriculture, & Food Security (CGIAR CCAFS), food production and consumption along the supply chain (including fertilizer manufacture, agriculture, processing, transport, retail, household food management, and waste disposal) contribute 19 to 29 percent of total greenhouse gas emissions each year. Food is no small potatoes when it comes to carbon footprint, then, responsible for more than half of all non–carbon dioxide greenhouse gas emissions (CGIAR CCFAS, 2014).

The hypothesis behind the Lexicon of Sustainability is compelling. Now more than ever, food decisions for conscientious consumers are crippling. If their confusion means they can't muster a humble elevator pitch in casual conversation about the risks posed by GMOs, why they pay more for fish with a traceable value chain, or why they want to start keeping bees, then the notion of voting with one's fork has limited power. We tune out vocabulary we don't understand, avoid dialogue or questions that make us feel ill-informed or hopeless, and thereby enable a cycle of peripheral awareness that looks dangerously like apathy. And the corporate food monopolies take advantage of this whenever they can — on packaging, in advertising, and in lobbying efforts designed to "protect us" from too much information. Some observe that label fatigue afflicts us in the food aisles. Corporate sustainability efforts on the part of food retailers to calculate and reduce carbon footprints by using compact fluorescent light bulbs or reducing packaging by 10 percent, for example, are what a cynic might call "polishing a turd," in the interest of marketing to the more conscientious consumer. Such self-reported scores, footprints, and rankings all serve to retain control over people's understanding of the issues, further distancing them from practical solutions.

Information asymmetry undermines the ability, so often touted by free market economists, for consumers to shift demand toward products with preferred characteristics. In her 2009 book, *Cheap,* Ellen Ruppel Shell offers an interpretation Gresham's Law, in which a quart of high quality milk and a quart of watered-down milk cannot sell for the price of their respective real values if the customer is unable to distinguish quality. Instead, an average price would predominate, with lower quality milk selling for more than it's worth, and the higher quality milk selling for less than it's worth. Eventually, the producers of the better milk go under, and the "watered-down milk sellers flourish" (Shell, 2009, p. 6).

When I interviewed Gayeton about his book, he offered an even better analogy: "If someone walked up to you on the street and said 'Close your eyes, let me put something in your mouth,' would you let them?"

The word "gross" came to my lips more readily than yes or no. "But essentially, that's what we do every day," Gayeton noted (personal communication, July 15, 2014).

He continued, "consumers now have more

responsibility than they ever have. FDA and USDA [U.S. Department of Agriculture] will not fix a failed food system" (personal communication, July 15, 2014). Nevertheless, Gayeton does not seem hopeless about the power of policy. In fact, part of the Lexicon of Sustainability includes Project Localize, a curriculum being piloted at 25 high schools in the U.S., and even two schools in Oaxaca and Guadalajara, Mexico, where the curriculum was translated into Spanish. In 2013, students from Ames, Iowa, took their artwork to members of Congress and the USDA to urge policymakers to control "the level of transparency about what goes into food" (personal communication, July 15, 2014), whether it's over fertilization, use of pesticides linked to bee depopulation, or use of ingredients with adverse environmental or human health impacts.

The idea that language is fundamental to social movements is nothing new. The power to bestow names on objects, people, places, and philosophies is undervalued, so we hardly notice when it gets abused. Noam Chomsky famously observed that destructive paradigms thrive because they impose on people "the feeling that they really are incompetent to deal with complex and important issues: they'd better leave it to the captain" (Chomsky, 1987, p. 42). The scientific and seemingly apocalyptic lingo of climate change, for example, leaves us fatigued. Acclaimed documentary films and books revealing the truths and consequences behind our comfortable lives relegate actionable solutions to the rushed final moments before the credits roll. Like tabloid headlines, every "Top Five Things You Can Do to Reduce Your Diet's Carbon Footprint!" seems like a set of tepid compromises between the contradictory messages coming from environmentalists on the one hand and nutritional faddists on the other: *Don't eat meat...but eat grass-fed meat! Eat local...but replace gluten with coconut flour and a rotating carousel of tropical superfoods, at least until stories emerge that the harvest of said superfood is endangering native culture and ecology!* Even the most uncontentious, no-brainer lifestyle changes can seem like moot points in the global context.

Gayeton calls his book a response to what he refers to as "Crisis Cults" that only focus on problems. With no shortage of potential catastrophes (rising seas, obesity, diabetes, increasing incidences of cancer, corporate monopolies, loss of top soil, contaminated groundwater), muckrakers emerge from every field like popping prairie dogs to elevate otherwise buried issues. But for Gayeton, crisis cults are "a bigger enemy" than the industrial food system they are fighting, since their focus on what is wrong tends to paralyze people with guilt rather than empower with inspiration.

The belief that sustainability literacy is the first step in a new direction underlies Gayeton's strategy to "create a thought bomb, an idea that people can't easily forget. Once they learn it, they can't unlearn it" (personal communication, July 15, 2014). I would argue that words alone are not enough, but if armed with examples of other innovators, leaders, and average people "doing the right thing," people will inevitably change the way they eat. After all, isn't new vocabulary easier to remember when you read a sample sentence using it? Context is everything.

The stories of "solutionaries" may not be as sensational as those offered by muckrakers, but I would agree that they are more likely to engender action. People naturally gravitate toward solutions, and *Local*'s strength is not only the variety and sheer number of solutions, but also that each is accompanied by a person and a place. In practical terms, this lexicon enables the possibility of a common language that enables conversation. Talking about "How to fix climate change" could be a long, ugly slog of a conversation, while talking about an urban gardener who milks a goat in her kitchen is easy, and maybe a little fun. While an albeit beautiful poster or three-minute film cannot fully convey the backstory, each offers an unintimidating invitation to learn more; the website offers a natural path for that.

In a way, the book is in keeping with researchers who have suggested that broad descriptors like "local" offer an incomplete and unsatisfactory entry into food systems, depriving consumers of a realistic understanding of examples. "Activists and organizers will need to innovate beyond standard marketing techniques, with the aim of communicating honestly and clearly about the complexity surrounding food production and consumption,

while also motivating commitment based on realistic understanding of the issues" (Hinrichs & Allen, 2008, p. 348). Others suggest that confusion around what "local" means could stunt its development, and recommend instead a taxonomy of geographical, relational, and values proximities (Eriksen, 2013).

Whether an expanded, more detailed food vocabulary can really empower normal folk to shift their perceptions and purchasing patterns is really a question left up to us. Words thrive on usage, and *Local*'s lexicon is more than an academic glossary. Whether it's through a pop-up art show in your community, nominating a school or teacher for Project Localize, gifting the book to your Aunt Helen, or sharing the short films on social media, we now have a new tool to initiate conversation. Why wait?

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
www.AgDevJournal.com

Locating nation, state, and identity in the global food debate

Book review by Nadra Hashim*
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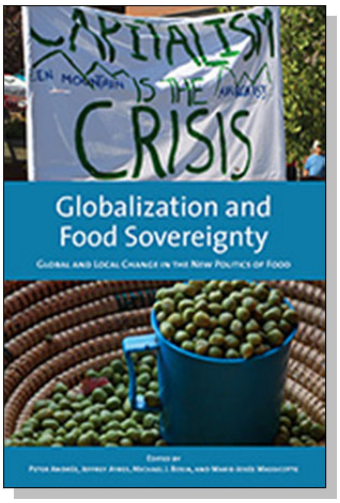

Globalization and Food Sovereignty: Global and Local Change in the New Politics of Food, edited by Peter Andrée, Jeffrey Ayres, Michael J. Bosia, and Marie-Josée Massicotte

Andrée, P., Ayres, J., Bosia, M. J., & Massicotte, M.-J. (2014). *Globalization and food sovereignty: Global and local change in the new politics of food.* Toronto: University of Toronto Press. Available as paperback. Publisher's website: http://www.utppublishing.com/Globalization-and-Food-Sovereignty-Global-and-Local-Change-in-the-New-Politics-of-Food.html

Published online September 18, 2014

Citation: Hashim, N. (2014). Locating nation, state, and identity in the global food debate [Book review of *Globalization and Food Sovereignty: Global and Local Change in the New Politics of Food*]. *Journal of Agriculture, Food Systems, and Community Development, 4*(4), 213–217. http://dx.doi.org/10.5304/jafscd.2014.044.019

The advocates of food security, food sovereignty, and indigenous sovereignty discuss the relative merits of each movement in *Globalization and Food Sovereignty*, a volume edited by Peter Andrée, Jeffrey Ayres, Michael J. Bosia, and Marie-Josée Massicotte. Like all rich academic discussion, the increasingly complex debate about food may be best understood where the philosophical and the practical converge. A good place to begin a discussion of the food debate may be in chapter four, located in the first third of the book. Professor Martha McMahon, sociologist by profession and farmer by vocation, has written a delightful and comprehensive analysis of one of the most interesting aspects of the food challenge. She describes, among other things, the specter of creeping government oversight and what for some is the equally frightening sensation of anarchical communalism.

So far, government oversight prevails, as McMahon describes what could be an Orwellian vignette emerging in western Canada. Canada's governing authorities have developed a system to monitor farm animals. In this instance, the subject is the rare Cotswold breed of sheep, which now must wear birth-to-death electronic tracking

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devices. McMahon suggests that the effort to "follow the sheep" is rooted in the neoliberal global food program of keeping food "plentiful and safe" (p. 117). According to McMahon, the extremes taken to keep food and farm produce abundant and safe highlight where food security advocates may be unwilling, or unable, to check excesses of corporate and government control; they also appear ambivalent about the need to promote "equitable social change" (p. 113).

For many food sovereignists, equitable social change begins with the right to refuse what they consider to be the dictates of the neoliberal food program. This includes genetically modified organisms and crops (GMOs), monocrop farming, and other strategies related to mass farming for food export. They wish, instead, to produce for their own consumption first, and then for everyone else. What sounds like a return to subsistence farming actually may be closer to "food first" localism (pp. 13, 27). Food first is producing for oneself and one's neighbors, and leaving the global market to fend for itself. Finding a unified means to advance food-first localism, and sovereignty more broadly, remains illusive.

Most, if not all, of the contributors to *Globalization* identify where they believe "movements for change" such as food sovereignty, and possibly indigenous sovereignty, continue to diverge (pp. 116, 121–123, 348). McMahon's chapter is instructive because it examines the origin and current site of divergence on food policy, where so many other political cleavages persist, in the perception of "identity" (p. 119). Identity is subjective, so by definition it is political. Identity quietly informs much of the analysis in *Globalization,* including the work of Noah Zerbe. Zerbe examines the decline of a Fordist model of agriculture, which he dubs "embedded liberalism." He then contrasts embedded liberalism with the contemporary rise of neoliberal financialization and the ascension of transnational corporations (TNCs). Zerbe suggests that these two trends have led to the demise of the family farm (pp. 87–89, 103).

Zerbe's discussion takes note of the state/market imperative, but he also discusses older trends, including ancient patterns of migration and more recent European imperialism, as well as persistent colonial and postcolonial trade routes. All these continue to shape identity as well as notions of food sovereignty. Here Zerbe quotes A. W. Crosby, noting that the Columbian food exchange is responsible for "introducing potatoes to Ireland and paprika to Hungary" (p. 89). Thus what we grow is what we come to know, and this informs not only our identity, but our identity politics.

Irene Knezevic calls these trends the "foodscape" in a chapter in which she outlines current developments in European Union agricultural policy (p. 229). Knezevic presents a theoretical debate where "food security concerns are…predictably absent" (p. 235). This is because food availability "in EU founding nations is generally good" (p. 235). Knezevic reveals the illusion of ever achieving food security when she describes a true tragedy of the Commons. Mines planted by internecine factions during the Balkan conflict of the 1990s now riddle what was once rich and arable farm land. The more mundane reality of neoliberalism is that while Knezevic suggests that Balkan farmers must "play by the rules," these rules are "non-negotiable" and lead to "spiraling debt and political powerlessness" (pp. 236–237). Knezevic reflects on pre-war Yugoslavia, where Serbia, Bosnia-Herzegovina, and Croatia's food supply was unified and made secure under a Socialist cooperative system. Here she suggests that food sovereignty made food security possible. Knezevic describes the neoliberal program as it stands now in the European Union, where many producers who cannot afford to operate commercially have chosen to opt out of the system. They operate in an informal space best described as food-first localism (pp. 242, 244–245).

In contrast, perhaps, to Knezevic's view, Peter Andrée, Sarah Martin, and Sarah Wright set the tone for achieving common ground. Wright's analysis of food activism in the Philippines finds that these farmers have successfully adopted sustainable agricultural strategies to advance both food security and food sovereignty. Wright argues that this process works below or beneath the capitalist system (pp. 200, 213–214). The success of the Filipino MASIPAG cooperative system suggests areas for potential overlap among the three movements.

Here "indigenous" Global South farmers use a network of neoliberal institutions such as large non-governmental organizations (NGOs) and local universities to promote the food sovereignty policy of local food rights first, and export second (pp. 205–206).

The emergence of food-first coalitions or alliances "for change," as described by Wright in her analysis of rural Filipino farmers, is reflected in similar campaigns by Global North urban farmers. As to whether food sovereignty is the antidote to state-sponsored neoliberal food security programs, Andrée and Martin argue that food sovereignty — a movement promoted by some left-center governments as "true" agricultural reform — is vulnerable to being co-opted (p. 175). Andrée and Martin suggest that Canada's various "mainstream" farming organizations may be guilty as charged (p. 175). It stands to reason that if food sovereignty could be subsumed by private organizations, governments might co-opt food sovereignty to an even greater extent, thereby preempting devolution and curtailing localism (p. 191).

Among food sovereignty's most determined organizations is La Via Campesina. LVC is the premier transnational coordinating NGO of food sovereignists that so far resists being co-opted. In this regard LVC has emerged as a force for producing "harmonious," if not unified, food-first policy formulation. In fact, Elizabeth Smythe documents LVC's public statements in which it promotes "the need to give primacy to both food security and food sovereignty principles" (p. 293). Andrée and Martin suggest, however, that while LCV may nod its head to food security publicly, it has pushed various food coalitions to abandon the food security discourse in favor of food sovereignty (pp. 179, 191). Further, while Philip McMichael suggests that food sovereignty promotes rather "elastic" definitions and objectives (p. 345), Andrée and Martin go further. They argue that food sovereignty is deficient in a more practical sense, noting that the sovereignists' agenda is focused largely on rural constituencies, such as those Knezevic describes. These groups can opt out of the global food program. Meanwhile new agriculturalists and urban farmers should be counted in this group, who must reform within the boundaries of the neoliberal "food security" program (pp. 177–178, 185).

Many states in both the Global North and South still address food issues within the neoliberal framework. This is true no matter how "conflicted" that system is. Bosia and Ayres suggest that the French government has been conflicted about promoting French culture and cuisine in the age of American fast food, or *malbouffe*. This "tension" extends to reconciling French participation in the neoliberal global food program — and the Wall Street investment banking that supports it (p. 331). Meanwhile, Bosia and Ayres describe a scenario in contemporary rural Vermont, which often views itself as fiercely independent, where among other neoliberal land consolidations and dislocations, the number of dairy farms declined by 81 percent between 1964 and 2004 (p. 335). Food sovereignists, various "mainstream" farmer organizations, and more "radical" cooperatives in Vermont are joining forces and adopting LVC strategies, targets, and campaigns "to strengthen local food systems" (p. 335). No matter how radically conceived, the strategies of these coalitions do not seem radical in practice, and they are certainly not anarchical. This social change seems more like a reform, rather than a rejection, of current transnational trade and neoliberal objectives.

Neoliberal reform may remain a popular way to organize the global market because, while it has an elaborate set of rules that Knezevic describes as hard to follow, these rules are generally known to all the players. The neoliberal food program is also strengthened by a vast incentive-disincentive mechanism that encourages members to play, cooperate, and even compromise in order to protect the dominant system. Food security advocates may need to make a greater effort to describe the origins of conflict within the food security agenda as they advocate to reform it. Some of these conflicts include tensions over how to assist the disadvantaged and whether states should rely on the market to correct the unequal distribution of goods. Other issues concern unequal access to services such as education, health, and employment. These extend to what Martin and Andrée call the neoliberal "roll-back" or reversal of social welfare programs (pp. 176, 183–184).

Although the authors never quite say it, there is a realization that rather than simply being a set of rules, neoliberalism is also an identity. As such, it remains difficult to challenge. The introductory chapter of *Globalization and Food Sovereignty* suggests a need to examine the Marxist response to the neoliberal food program. This is especially true where Cuba's recent liberalization efforts in the agricultural sector have been cited as alternative to the second green revolution (p. 3). Here Marie-Josée Massicotte's chapter outlining asymmetry, dislocation, and a "feminist ecology" in Latin America may find resonance (pp. 258–260, 268–270).

Power asymmetry and economic dislocation are chief concerns for many food sovereignists, including Raj Patel, whose critique of neoliberal reform is challenged in *Globalization*'s introductory chapter. However, the response as formulated by editors Andrée, Bosia, Ayers, and Massicotte seems somewhat abbreviated or rushed. More specifically, Patel's reliance on Karl Polyani and a preference for the "superiority of ancient communal systems" should be challenged more directly, if not addressed at greater length (pp. 39–40, 74, 179). Feudal land systems in so-called "ancient" cultures have been notoriously resistant to equitable land reform. Michael Menser suggests that even now, and within the emerging food sovereignty movement, there is growing cleavage between the peasants on "rich" land and the "poor," landless, "have-nots." This is especially true in nations with a feudal history, where antediluvian communal inequality, rather than "modern" state-sponsored land grabbing, may be the most significant "flashpoint" (pp. 73–74, 345). A fuller critique of Patel could have provided a context for including a chapter focusing exclusively on identity politics in the aboriginal/indigenous sovereignty movements of North America and Canada.

Readers who want an abbreviated, if rather skeptical, examination of food sovereignty may wish to read McMichael's concluding chapter first. He argues that for many food sovereignists, food is just a starting point, or "flashpoint," to initiate other systemic changes (p. 345). Other critiques of the neoliberal food program describe the excesses of a system, including the overseeding, overmechanization, overfertilization, and vast genetic modification of crops, all of which lead to the overproduction of food for export. More than any of these, McMichael seems most worried about the overfinancialization of agriculture.

According to McMichael, overfinancialization requires massive agricultural investment, which in turn necessitates vast land grabs. Although not defined here expressly, overfinancialization may be the fullest realization of the transnational, neoliberal economic project. It is the incorporation of small farms into ever-expanding TNC control. A preliminary discussion of this and other economic and political science terminology in a dedicated theory chapter would have been useful. These views are echoed outside the food debate by a variety of economists and are the subject of several books by former World Bank director and Nobel Prize–winning economist Joseph Stiglitz. If as McMichael suggests these persistent, large-scale land grabs are increasing, then the icebergs loom large. Under these conditions, neoliberal reform may simply amount to arranging deck chairs on the Titanic amid growing chaos and decline. Further, there is skepticism in this chapter, and in other quarters, as to whether Global North neoliberals would ever commit to a second green revolution, this time for Africa, unless the exercise were extremely profitable (pp. 44, 121, 123).

An argument made in the middle section of the book, that in using food sovereignty to build a better "system," food advocates could lose food security and still not achieve this sovereign system, is quite compelling (p. 256). Other topics that could benefit from further illumination are the Slow Money movement that will have to gain strength if it hopes to challenge fast food and "fast money" (pp. 42–44, 297). Despite these constraints, Martin, Andrée, and Zerbe suggest the local food and fair trade movements (and urban farming could be mentioned here as well) are neoliberal reforms that have "led to an improvement over the conventional system" (pp. 94–96, 103–104).

There is, however, room for improvement, as Elizabeth Smythe suggests. In her chapter on trade rules and food origin, Smythe examines the increasing power and reach of organizations that claim to be small NGOs or think tanks, but are

really more akin to lobbying organizations for transnational food giants. These lobbyists fight regulation regarding GMOs and country-of-origin labeling, both within their nations and across international boundaries. Most dramatically they fight regulation at meetings of international agencies such as the World Trade Organization and the Food and Agriculture Organization of the United Nations (FAO), which seek agreements on regulation (pp. 298, 305–307, 310). Smythe concludes that sovereignty will not be achieved until food consumers join the fight concerning how their food is regulated (p. 313). The same could be said for food security.

McMichael's concluding commentary that the state system is merely the remedy to a world with violent histories (p. 350) explains a major point of divergence within the food debate. Those promoting neoliberal food security reform continue to view the sovereignty movements, with their elastic viewpoints regarding self-determination, as a problem of theoretical or even administrative concision. States, on the other hand, tend to view these "radical" attitudes as falling squarely within the landscape of "national" security, an arena where McMahon suggests that opinions and activities are very closely monitored (pp. 268–270).

It would have been useful for the contributors to *Globalization,* who offer both a critique and a defense of the "neoliberal food program," to have defined their terminology with greater precision or attention. McMahon suggests that the food security model "is dangerously under-theorized and carries concealed tensions" (p. 128). A remedy to this problem could have been a short theory chapter in the first section of the book. This chapter could start with the rise of the modern European state beginning with the treaty of Westphalia, a term used throughout the book. It might then move to an analysis of neoliberal state, political, market, and economic theories, including the concept of neoliberal overfinancialization that is much discussed in the book. Further, the basic notion of what constitutes neoliberal reform as understood by the authors of *Globalization,* and as discussed in the broader foodscape, seems to differ from other, more pervasive, definitions of neoliberal reform. In broader discussions of economic theory, contemporary neoliberal reform (often dubbed the Washington Consensus) seeks a restructuring of national economies that previously relied on state-sponsored, socialist and sometimes Marxist-leaning, centralized economic planning. A simple definition to delineate how foodscape neoliberal reform (which seems to revisit Keynesian welfare intervention and promotes the reform various aspects of the neoliberal market-based model) differs from the Washington Consensus (which is known for its anti- Keynesian, pro-market, minimalist state-planning approach) would clarify the unique parameters of the food debate. These, and a range of other concepts, are presently dispersed throughout the chapters of *Globalization,* diffusing their impact.

A unified theory chapter could have introduced new readers to neoliberalism and served as review for others. It is important to note that the contributors to *Globalization* often imply what many neoliberal economists and political scientists state more explicitly: namely that the primary imperative of state building, national security, and even the establishment of relations between states is to promote the territorial integrity of the state within each "state." This is pursued while simultaneously advancing the ascendancy of the global market both above and below the state. Having said that, a latent factor influencing neoliberal economic state building, but one rarely if ever discussed, is how identity influences "rational" economic behavior.

In an effort to explore the potential deficiencies of both food security and food sovereignty, *Globalization and Food Sovereignty* provokes more questions then it answers. This of course is how any good introduction to a new or expanding field should be: thoughtful and provocative.